MALNUTRITION AMONG RURAL AND URBAN CHILDREN IN LESOTHO: RELATED HAZARD AND SURVIVAL PROBABILITIES

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ABSTRACT

The relationship between the survival time of children and several variables that affect the survival and nutritional status of children under the age of five years in the Maseru District of Lesotho was investigated. Kaplan-Meier survival probabilities, lifetables and the extended Cox proportional hazards model were used to identify factors that strongly affect malnutrition among children and survival up to the age of five. The predictor variables used for data analysis were: residential area, the literacy status of the mother, the income status of the mother, the immunisation status of the child, acute respiratory infectious diseases, diarrhoeal diseases, tuberculosis, the extent of malnutrition suffered by the child, height, weight, height for age, weight for height, weight for age and the overall health condition of the child. Results from the study showed that the extent of malnutrition was strongly related to the residential area, the literacy status of the mother and monthly household income.

OPSOMMING

Die verhouding tussen die oorlewingstyd van kinders en verskeie veranderlikes wat die oorlewings- en voedingstatus van kinders onder die ouderdom van vyf jaar affekteer is in die Maseru-distrik in Lesotho nagevors. Kaplan-Meier oorlewingswaarskynlikhede, lewenstabelle en die uitgebreide Cox proporsionele risikomodel is gebruik om die faktore te identifiseer wat wanvoeding en die oorlewing van kinders tot die ouderdom van vyf jaar die meeste beïnvloed. Die voorspellingsveranderlikes wat gebruik is vir data-analises was: die woongebied, die geletterdheid van die moeder, die inkomstestatus van die moeder, die immuniseringstatus van die kind, akute aansteeklike asemhalingsiektes, diarreeverwante siektes, tuberkulose, die graad van wanvoeding van die kind, lengte in verhouding tot ouderdom, gewig in verhouding tot lengte, gewig in verhouding tot ouderdom en die algehele gesondheidstand van die kind. Resultate van die studie toon aan dat die omvang van wanvoeding grotendeels geaffekteer word deur die woongebied, die geletterdheid van die moeder en die maandelikse huishoudelike inkomste.

INTRODUCTION

The Kingdom of Lesotho is a small Southern African country with a total population of 2 million people. The total surface area of Lesotho is 30 355 square kilometres. There are 10 districts in Lesotho, and the capital city of the kingdom is Maseru. The district of Maseru contains 20% of the population of Lesotho. Lesotho is known for its abundant water resources and high altitude above sea level. The national health coverage rate of Lesotho is relatively lower than corresponding coverage rates in neighbouring countries such as South Africa, Botswana, Namibia and Swaziland. Rural children in Lesotho are disadvantaged with respect to basic health services, education, income as well as nutrition. Infant and under-five mortality rates are higher among rural children than in urban areas (Lesotho UNICEF Country Office, 1994:1-29). This article compares rural and urban children under the age of five in Lesotho with regard to the provision of basic health services, severity of malnutrition as well as survival and hazard probabilities, and shows that rural children are indeed far more adversely affected by these factors than their urban counterparts.

BACKGROUND TO THE STUDY

Rural children in Lesotho are disadvantaged with respect to basic health services such as immunisation, nutrition, education and income (Lesotho Ministry of Health and Social Welfare, 1997:1-38). Although several studies have indicated this fact, not enough has been done to address malnutrition and poverty among rural children in Lesotho. Rural children in Lesotho are mostly brought up and fed by their mothers as almost half of the male work force between the ages of 20 and 44 immigrates to South African mines in search of jobs in the mining industry (Maw & Letsie, 1999:1-24). As a result, the burden of feeding children, working on farms, fetching water and firewood, and looking after the cattle becomes the responsibility of the mother alone (Lesotho Population and Manpower Division, 1993:Tables A to G). This, coupled with the fact that the Ministry of Health and Social Services of Lesotho has not done enough to address problems relating to the delivery of primary health care services to the rural population of Lesotho, has left rural children much more vulnerable than their urban counterparts.

This study was thus conducted primarily to obtain baseline data on the health condition of rural and urban children who lived in the Maseru District of Lesotho with a view to produce a coherent plan of action for government policy and intervention programmes conducted by the Lesotho UNICEF Country Office. It should be noted that this study has been planned to gather facts about, and not to address problems of malnutrition. However, following the completion of this study, an evaluative action research of existing feeding programmes has been conducted by UNICEF and the Ministry of Health and Social Welfare of Lesotho.

PROBLEM STATEMENT

The absence of reliable statistical information and baseline data on basic health coverage rates and the severity of malnutrition among rural children under the age of five years has been a major obstacle to efforts made by the Ministry of Health and Social Welfare of Lesotho, the UNICEF and the WHO to produce integrated feeding programmes in various parts of rural and urban Lesotho. The few studies done in these areas prior to this study were essentially cross-sectional and descriptive, and were based on small samples that were not representative of the broader population. Based on indirect estimation and projections, it was reported that malnutrition and under-five mortality and morbidity are much higher among rural children than among urban children in Lesotho. Based on reports from the Lesotho Bureau of Statistics and the World Bank, it was assumed that urban children under the age of five years in Lesotho have better access to basic health, economic and education services than rural children. However, there was no direct proof to the above claims until the present study was conducted on a large representative sample and sound statistical techniques of estimation (Worku, 2001:87-94).

REVIEW OF THE LITERATURE

The nutritional status of children is often defined by clinical, anthropometric and biological indicators. Several researchers have demonstrated that anthropometric indicators are easy to measure in the field, and convenient and fairly reliable to assess the nutritional status of children (Teka, Faruque & Fuchs, 1996:1070-1075) in rural African communities.

Waterlow (1972:566-669) classified and defined various categories of protein-calorie malnutrition that are being used today by nutritionists to assess the severity of malnutrition among children under the age of five. In most developing countries in Africa, protein-energy malnutrition is a major factor in childhood illness (Bern, Zucker & Perkins, 1997:8796).

Several sources such as the Lesotho Ministry of Health and Social Welfare, (1997), Worku, (2001:87-94), Maw and Letsie (1999:1-24), Motlomelo and Sebatane (1999:1-26) and Tolboom, Ralitapole-Maruping and Kabir (1986:351-358) have consistently indicated that rural children in Lesotho are disadvantaged with regard to basic health services and economic opportunities. Protein-energy malnutrition (PEM) remains a major public health problem in Lesotho. In the study by Tolboom *et al.* (1986:351-358) a quarter of observed deaths occurred among severely malnourished children.

In 1986, the infant mortality rate in urban areas of Lesotho was 71 per thousand live births, and 86 per thousand live births in rural areas (Lesotho Bureau of Statistics, 1986:1.5-3.24). In 1996 the under-five mortality rate in the entire Maseru District of Lesotho (rural and urban) was estimated at 98 per thousand live births (Worku & Makatjane, 1996:54-71). The same study showed that basic health services were better delivered by the Lesotho Health Ministry in urban areas than in rural areas, and that rural children under the age of five years were particularly vulnerable. De Waal, Worku and Groenewald (1998:67-82) showed that a short duration of breastfeeding was a leading cause of infant mortality in Lesotho. The same study showed that rural children were particularly disadvantaged with respect to basic health services.

The Ministry of Health and Social Welfare of Lesotho carried out a survey in October 1993 to evaluate the overall health coverage rate of the nation. According to this study the coverage rate of the expanded programme of immunisation (EPI) was 71 percent. The study showed that 63% of rural mothers were illiterate, 69% of rural mothers earned less than R1 000 per month and 59% of them had little or no access to basic health services. Rural children under the age of five years were malnourished (Worku & Makatjane, 1996:54-71). The study revealed that the major reasons for not achieving a higher coverage rate of immunisation were management problems and lack of accurate information within the health system. The study also showed that 45% of all women in the study attended postnatal health care services, and that 68% of them were willing to practice family planning methods, but did not have the money to pay for such services. It was also noted that most rural mothers in the study were not even aware of the presence of family planning methods (Lesotho Ministry of Health and Social Welfare, 1993:1-43).

Malnutrition continues to be a problem even though the number of children hospitalised for this reason shows a decrease, which probably does not match with reality. Following the death of their parents, most of the malnourished children are staying with their grandparents or other members of the family, which frequently leads to inadequate feeding. Due to the spread of the HIV pandemic, the number of malnourished children is likely to increase during the coming years. It must be noted that more and more malnourished children are found to be HIV positive. The statistics indicate that Lesotho like many other sub-Saharan countries has suffered great human loss because of the AIDS pandemic (UNAIDS, 2001:12-47). A recent study conducted by Maw and Letsie (1999:1-24) on behalf of the Ministry of Health and Social Welfare of Lesotho shows that there is a direct link between the spread of HIV/AIDS and an increase in the number of orphaned and malnourished children under the age of five years.

AIM OF THE STUDY

This article is based on data collected from 4 001 children under the age of five and their mothers in the Maseru District of Lesotho. The aim of the study was to compare urban and rural children with regard to the prevalence of malnutrition as well as survival and hazard probabilities using statistical tools such as life tables, Kaplan-Meier survival probabilities, hazard probabilities and the Cox proportional hazards function (Kleinbaum, 1996:56-114). The study shows that rural children fare worse on all these measurements than their urban counterparts. The study was carried out in the Maseru District, the largest of the 10 districts in Lesotho, which includes the capital city of Lesotho - Maseru. It can thus be argued that the sample is fairly

representative of the total population of Lesotho.

Objectives

The objectives of the study were:

- to identify factors that strongly affect malnutrition; and
- to compare rural and urban children in the study with respect to malnutrition, survival and hazard probabilities.

RESEARCH DESIGN

This is a descriptive five-year follow-up study involving two cohorts of children (rural and urban) who were born in the Maseru District of Lesotho between September 1989 and September 1994. The sample size of the study was 4 001 children under the age of five. The District of Maseru was divided into two strata: rural (70% of sample) and urban (30% of sample). Each stratum was subsequently split into several zones. At each zone the number of eligible households was determined using techniques of proportional allocation with respect to size. Rural and urban zones and households were identified on the basis of criteria used by the Lesotho Bureau of Statistics. A sampling frame was prepared, and eligible households, children and their mothers in the study were selected using systematic random sampling.

Life tables, Kaplan-Meier survival probabilities, hazard probabilities and the Cox proportional hazards model (Kleinbaum, 1996:56-114) were used to compare urban and rural children with respect to malnutrition and chances of survival.

ETHICAL CONSIDERATIONS

Mothers and caretakers who took part in the study were chosen voluntarily and signed a consent form voluntarily. Each study participant was given a full explanation of the study, and was interviewed in private. Results of interviews and records were kept in confidence. Each participant in the study was assigned a unique study number to ensure anonymity and confidentiality. Where necessary, questions were asked in Sesotho (the official language in Lesotho).

DATA COLLECTION

All health-related, clinical and anthropometric measurements were taken by health professionals employed by the Ministry of Health and Social Welfare of Lesotho. Statistical records and questionnaires were filled in and verified by fourth year students of statistics and demography from the National University of Lesotho who were trained for the study by the Ministry of Health and Social Welfare of Lesotho and the UNICEF country office in Lesotho. In most cases, questions were asked in Sesotho as the majority of mothers in the study spoke Sesotho as their first language. Records were kept for each child in the study during the period of the study.

The list of variables and their levels

Data were collected from each of the children selected for the study and their mothers in order to identify factors that affect malnutrition and survival. The variables of interest were a combination of anthropometric, demographic, socio-economic, health-related and sanitary factors that affect malnutrition and survival.

The extent of malnutrition in each child was assessed utilising commonly employed anthropometric variables, as recommended by the WHO. Anthropometric variables used were height for age (HAZ), weight for height (WHZ), weight for age (WAZ) and mid-upper arm circumference (MUAC). Anthropometric measurements were compared with WHO international growth references (Jeliffe, 1966:2-11), and were expressed as weight for age (WAZ), height for age (HAZ) and weight for height (WHZ) Z scores. The rate of growth of children in the study was assessed by growth monitoring charts of the American National Center for Health Statistics (National Center for Health Statistics, 1977:78-1650). Height was measured in centimetres, age in months, and weight in kilogram. Salter scales were used to measure weight. For children under the age of two years, the recumbent length was measured by the use of calibrated measuring boards. For older children, standing height was measured using stadio meters. *Stunting* was measured using Z-scores from height for age (HAZ). *Wasting* was measured using Z-scores from weight for height (WHZ). The degree of *malnutrition* was measured using Z-scores from weight for age (WAZ). Using the NCHS reference height for age chart, the height of a child was compared to the

height corresponding to a perfectly healthy child of the same age and sex on the NCHS chart. A child is said to be stunted if his/her height is less than the corresponding median height on the NCHS chart by two standard deviations. Weight for age (WAZ) was used as a measure of the degree of under-nutrition. Using the NCHS reference weight for age chart, the weight of a child was compared to the weight corresponding to a perfectly healthy child of the same age and sex on the NCHS chart. The child is said to be *malnourished* if his/her weight is less than the corresponding median weight on the NCHS chart by two standard deviations. Weight for height (WHZ) was used as a measure of wasting. Using the NCHS reference weight for height chart, the weight of a child was compared to the weight corresponding to a perfectly healthy child of the same height and sex on the NCHS chart. A child is said to be *wasted* if his/her weight is less than the corresponding median weight on the NCHS chart by two standard deviations.

In addition to anthropometric variables, data were collected from each child in the study on demographic and socio-economic factors that affect survival, as indicated in Table 1.

Monthly household income is said to be *low* if the average monthly income of the household is less than R 2 000. Monthly household income is said to be *moderate* or better if the average monthly income of the household is greater than or equal to R 2 000.

A child is said to be *malnourished* if the weight of child is less than the corresponding median weight of a perfectly healthy child on the NCHS chart by two standard deviations or more. A child is said to be *not-mal*

Table 1: List of variables of study and their levels

Variable of study	**Level 1**	**Level 2**
Survival status of child	Dead	Alive
Residential area	Rural	Urban
Literacy status of mother	Illiterate	Literate
Monthly household income	Low	Moderate or better
Immunisation status of child	Not fully immunised	Fully immunised
Acute respiratory infections in child	Yes	No
Diarrhoea in child	Yes	No
TB in child	Yes	No
Malnutrition in child	Yes	No
Height of child in cms		
Weight of child in kgs		
Height for age of child		
Weight for height of child		
Weight for age of child		
General health condition of child	Poor	Moderately good or better
Age of child in months		

nourished if the weight of child lies within two standard deviations of the corresponding median weight of a perfectly healthy child on the NCHS chart.

DATA ANALYSIS

First of all, a comparison was made between the 393 non-survivors and the 3 608 survivors in the study with regards to variables relating to both categories of children (Tables 2 and 3). Secondly, a similar comparison was done between the surviving 2 544 rural and 1 064 urban children (Table 4). Thirdly, a summary of anthropometric measures was obtained for the 3 608 survivors in the study (Table 5). Fourthly, life tables and Kaplan-Meier survival probabilities were obtained for urban (Table 6) and rural (Table 7) children in the study with age intervals of 12 months. Next, the extended proportional Cox Hazards model (Table 8) was used to identify predictor variables that strongly affect survival time on the basis of hazard ratios. Lastly, Kaplan-Meier survival probabilities were used to compare the relative probabilities of survival of rural and urban children graphically (Figure 1). The statistical package STATA version 7 was used for data analysis.

RESULTS OF STUDY

Using the reference curves in the NCHS growth monitoring charts as a guideline, 54.99% of the 3 608 survivors in the study were stunted, 49.67% of them were wasted, and 16.63% of them were malnourished. For the 3 608 survivors in the study, the average height for age ratio (HAZ) was 4.56, the average weight for height ratio (WHZ) was 0.13, and the average weight for age ratio (WAZ) was 0.56. Although NCHS standards are not ideally suited for Southern African children, comparison of HAZ, WHZ and WAZ figures in this study with the reference figures for perfectly healthy children in the NCHS reference charts indicates that the nutritional status of the 3 608 survi-

Table 2: Group proportions for non-survivors and survivors

Variable	Non-survivors (n=393)	Survivors (n=3608)
Survival status of child	Dead: 393/4001 = 9.8%	Alive: 3608/4001 = 90.2%
Residential area	Rural: 297 = 76% Urban: 96 = 24%	Rural: 2544 = 71% Urban: 1064 = 29%
Literacy status of mothers	Illiterate: 304 = 77.4% Literate: 89 = 22.6%	Illiterate: 321 = 8.9% Literate: 3287 = 91.1%
Monthly household income	Low: 318 = 80.9% Otherwise: 75 = 19.1%	Low: 758 = 21.0% Otherwise: 2850 = 79.0%
Immunisation status of children	No: 240 = 61.1% Yes: 153 = 38.9%	No: 913 = 25.3% Yes: 2695 = 74.7%
Acute respiratory infections in children	Yes: 325 = 82.7% No: 68 = 17.3%	Yes: 372 = 10.3% No: 3236 = 89.7%
Diarrhoea in children	Yes: 263 = 67.0% No: 130 = 33%	Yes: 1082 = 30% No: 2526 = 70%
TB in children	Yes: 153 = 39.0% No: 240 = 61.0%	Yes: 487 = 13.5% No: 3121 = 86.5%
Malnutrition among children	Yes: Not recorded No: Not recorded	Yes: 600 = 16.6% No: 3008 = 83.4%
General health condition of children	Poor: 393 = 100% Good: 0 = 0%	Poor: 325 = 9% Good: 3283 = 91%

vors in the study is generally poor by North American standards.

Table 2 gives comparative proportions for children who were alive at the end of the five-year follow-up period and those children who died. It can be deduced from Table 2 that children who died were mostly rural children, had generally poor health conditions, belonged to illiterate mothers, were malnourished and came from low-income households. All in all, 393 of the 4 001 children in the study died before the age of five years. This represents 9.8% of the entire sample (N = 4001). The table also shows that 297 of the 393 children who died before the age of five (76%) were rural children, whereas 96 of the 393 children who died before the age of five (24%) were urban children.

Alternatively, Table 3 indicates that for the sample as a whole (N=4001 representative of the general public), 10.46% (n=297) of rural children (N=2841) in the sample died before the age of five years while only 8.3% (n=96) of the sample from the urban area (N=1164) died.

Table 4 gives a comparison between live rural and urban children with regards to key health indicators. The table shows that rural children are clearly disadvantaged in comparison with urban children.

Table 5 gives a summary of anthropometric variables such as height for age (HAZ), weight for height (WHZ) and weight for age (WAZ) for the 3 608 children who were alive at the end of the follow-up period. Table 3 also shows that the mean age of children who were alive at the end of the study period is 24.17 months. (The corresponding figure for the 393 children who died is only 10.53 months).

Tables 6 and 7 give the number of deaths and survival probabilities for urban and rural children respectively. A comparison of the corresponding figures in the "Deaths" columns of Tables 6 and 7 shows that the number of deaths per age interval for rural children is much higher than the corresponding number of deaths per age interval for urban children. A comparison of corresponding figures in the "Survival probability" columns of Tables 6 and 7 shows that survival probabilities per age interval of rural children are smaller than corresponding survival probabilities for urban children.

Figure 1 shows Kaplan-Meier survival curves for urban and rural children on the same plane. It can be seen from Figure 1 that the survival probability curve of rural children lies lower than the survival probability curve of urban children over the duration of analysis. The log-rank test was performed to compare the significance of the above finding. At the α= 0.01 level of significance, the difference between the two groups of children was highly significant (p=0.0006). Five of the nine dichotomous predictor variables (residential area, literacy status, income, diarrhoea and malnutrition) proved to be time-varying covariates. Hence, analysis was done using the extended Cox proportional hazards model. Table 8 shows estimates obtained from the extended Cox proportional model.

The theoretical reliability of the estimated Cox regression model was confirmed using the likelihood ratio chi-square test with nine degrees of freedom, an observed chi-square value of 1766.41 and a p-value of 0.0000. Table 8 also shows that all standard errors of estimation are small. This indicates that the predictor variables used for analysis are jointly useful in accounting for the survival of children.

Table 3: Differential survival/non-survival for rural and urban children

	Rural		Urban	
	n	%	n	%
Non-survivors	297	10.46%	96	8.3%
Survivors	2544	89.54%	1064	91.7%
TOTAL	2841	100%	1160	100%

Table 4: Comparison between 3608 live rural and urban children

Variables	Rural children (alive) N=2544 (71%)		Urban children (alive) N=1064 (29%)	
	N	%	n	%
Illiterate mothers	1333	52.4%	213	20.0%
Mothers with TB	211	8.3%	79	7.4%
Deliveries not attended by health worker	366	14.4%	117	11%
Mothers not given antenatal health care	631	24.8%	213	20%
Mothers not given postnatal health care	481	18.9%	177	16.6%
Children not fully immunised	829	32.6%	207	19.5%
Children with acute respiratory infections	738	29.0%	189	17.2%
Children with diarrhoeal diseases	913	35.9%	348	32.7%
Malnourished children	481	18.9%	118	11.1%
Children with poor health condition	501	19.7%	183	17.2%
Children with TB	451	17.7%	124	11.7%
Weight for age ratio (WAZ)	4.8790		3.8119	

Table 5: Summary of anthropometric measures for the 3608 survivors

Variable	Mean	Std. Dev.	Min	Max
Height in cms	69.80	7.41	35	115
Weight in kgs	9.49	1.08	3	24
Height for age (HAZ)	4.56	3.18	1.08	16.67
Weight for height (WHZ)	0.13	0.03	0.06	0.23
Weight for age (WAZ)	0.56	0.33	0.1	2.08
Age in months	24.17	2.16	3	60

Table 6: Lifetable for urban children with age intervals of 12 months

Age interval in months	Children at risk	Deaths	Survival probability	Std. Error	95% C. I.
0 to 12	1160	64	0.9403	0.0072	[0.9244, 0.9530]
12 to 24	920	24	0.9130	0.0089	[0.8938, 0.9289]
24 to 36	712	8	0.9010	0.0098	[0.8800, 0.9184]
36 to 48	488	0	0.9010	0.0098	[0.8800, 0.9184]
48 to 60	320	0	0.9010	0.0098	[0.8800, 0.9184]
60 to 72	112	0	0.9010	0.0099	[0.8800, 0.9184]
Total		96			

Table 7: Lifetable for rural children with age intervals of 12 months

Age interval in months	Children at risk	Deaths	Survival probability	Standard Error	95% C. I.
0 to 12	2841	216	0.9139	0.0056	[0.9022, 0.9242]
12 to 24	1961	25	0.8997	0.0062	[0.8869, 0.9112]
24 to 36	1240	32	0.8705	0.0079	[0.8542, 0.8851]
36 to 48	696	16	0.8445	0.0100	[0.8239, 0.8629]
48 to 60	360	8	0.8138	0.0143	[0.7838, 0.8401]
60 to 72	72	0	0.8138	0.0143	[0.7838, 0.8401]
Total		297			

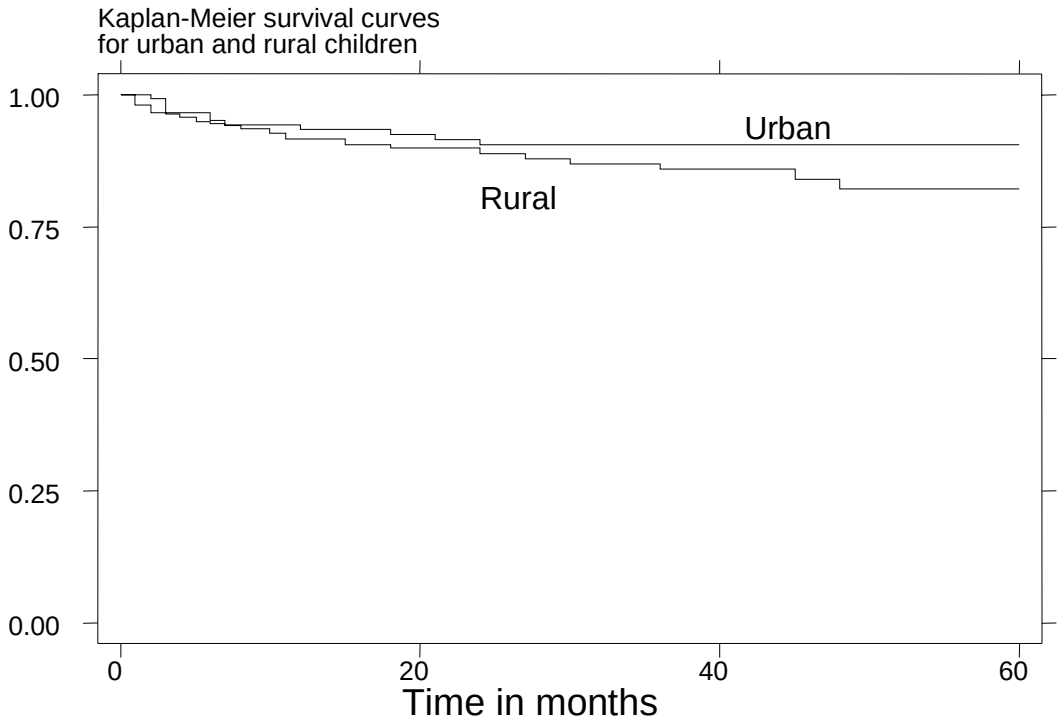

Figure 1: Kaplan-Meier survival curve for urban and rural children

Table 8: Table of estimated hazard ratios from Cox regression

Variable	Hazard Ratio	Standard Error	p-value	95% C. I. for HR
Immunisation	1.757852	0.0192782	0.000	[1.377054, 2.138650]
ARI	1.578531	0.0718337	0.000	[1.246078, 1.910984]
TB	1.961472	0.0205485	0.000	[1.549623, 2.373322]
Health	1.458463	0.0327241	0.000	[1.014569, 1.902358]
Residence	2.195696	0.0110085	0.000	[1.743497, 2.647896]
Literacy	2.210318	0.0098347	0.000	[1.966041, 2.454595]
Income	1.859638	0.0117941	0.000	[1.584582, 2.134694]
Diarrhoea	1.547740	0.0080260	0.000	[1.130926, 1.964554]
Malnutrition	2.364070	0.0086084	0.000	[1.897197, 2.830943]

The goal of survival analysis is to determine the hazard ratios of the predictor variables in the model. If the hazard ratios are greater than 1, the odds of death are increased. If the hazard ratios are less than 1, the odds of death are decreased. If the odd ratios are equal to 1, the predictor variable in charge has no influence on survival at all.

The hazard ratio column in Table 8 shows that survival time is strongly affected by malnutrition, literacy status of mother, residential area, TB, income status, immunisation, acute respiratory infectious diseases, diarrhoea and health condition, in a decreasing order of strength. In each case, p=0.000, and the hazard ratios are greater than 1.

The estimated hazard ratios are interpreted as follows: The hazard ratio for the malnutrition variable is 2.36. This shows that malnourished children are 2.36 times more vulnerable to death than children who are not malnourished. The hazard ratio for the literacy variable is 2.21. This shows that children whose mothers are illiterate are 2.21 times more vulnerable. The same applies to the residence variable (2.19), the tuberculosis variable (1.96), the monthly income variable (1.86), the immunisation variable (1.76), acute respiratory infectious diseases (1.58), diarrhoeal diseases (1.55) and overall health condition (1.46).

DISCUSSION

The study shows that survival time is strongly affected by malnutrition, the literacy status of the mother, residential area, tuberculosis, monthly income of household, immunisation, acute respiratory infectious diseases, diarrhoeal diseases and overall health condition of the child, in a decreasing order of strength. All in all, 393 of the 4 001 live births (9.822%) followed up from September 1989 to September 1994 ended in death. Out of the 4 001 live births under five years of age selected at random for this study, 281 (7.0233%) were infant deaths. The remaining 112 deaths were of children between one and five years. Of the infants who died, 217 (77.24%) of them lived in rural parts of Maseru. In total, 297 of the 393 or 77% of the deaths were of children in the rural parts of Maseru, whereas only 96 of the 393 deaths (23%) were of urban children.

The study also gives the following four major prevalence rates. Of the 4 001 children in this study, 34% have suffered from diarrhoeal diseases, 22% have suffered from acute respiratory infectious diseases, 26% have suffered from chronic malnutrition, and 17% have suffered from tuberculosis.

The following recommendations, based on findings of the study, are made to further reduce child mortality and morbidity in the Maseru District of Lesotho:

The issue of chronic malnutrition and famine, particularly in the rural parts of the district, has to be addressed by all government ministries and organisations concerned.

The Ministry of Health and Social Welfare must pay particular attention to the rural parts of the Maseru

District as most of the victims of the study lived there. Integrated feeding programmes as well as improved health services and infrastructure should be made available to the rural population of the District. If resources are available, similar feeding and health services should be extended to other rural parts of Lesotho where communities experience poverty and drought. The various health services and feeding programmes that are often provided to the rural communities of Lesotho by non-governmental organisations such as the Christian Health Association of Lesotho (CHAL) and international agencies such as the UNICEF should be integrated with services provided by the Ministry of Health and Social Welfare of Lesotho. Doing so will enable the Ministry of Health and Social Welfare of Lesotho to monitor feeding and health service programmes and evaluate their efficiency.

The study has shown that 81% of all households in the study have not been visited by community health workers between September 1993 and September 1994. The study has also shown that the majority of rural mothers (58%) included in the study did not know enough about how HIV/AIDS spreads. Awareness about personal hygiene, use of safe water and protected toilets was low among rural mothers. For this reason, there is a need to promote existing community-based health-related programmes and activities throughout Lesotho, with emphasis to rural communities. This task can best be done using a community-based approach and primary health care principles, as is often suggested by the World Health Organization. Such an effort will help reduce malnutrition, mortality and morbidity among rural children in Lesotho who are often inconvenienced due to lack of nearby health facilities and the provision of basic health services.

CONCLUSION

The findings of the study on which the article reports support those of several other studies. These indicate that in Lesotho, rural children are more disadvantaged than urban children with regard to basic health services and economic opportunities. This manifests in higher hazard and lower survival probabilities among rural children in relation to nutrition and malnutrition. For this reason, the Government of Lesotho has several feeding programmes in place. These are monitored for their effectiveness through evaluative action research conducted by UNICEF and the Ministry of Health and Social Welfare of Lesotho.

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