Research Article

Quality of child health care and under-five mortality in Zambia: A case study of two districts in Luapula Province

Augustus Kasumpa Kapungwe

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Quality of child health care and under-five mortality in Zambia: A case study of two districts in Luapula Province

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Abstract

This study was intended to investigate the factors associated with the high under-five mortality in one province of Zambia. Specifically the study (a) Identifies predominant traditional cultural beliefs and perceptions concerning main causes of child deaths; (b) assesses quality of health care services; and, (c) determines the causes of death among children under-five years. Multiple data collection instruments were used to collect the necessary information about *360* deaths. Findings indicate that most children died before the second year of life with more than 50% dying before their first birthday. The paper argues that most of the deaths could have been averted had quality health care been provided. Recommendations on how to improve child health care provision are provided.

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1. Introduction

1.1 Background

Of the nine provinces in Zambia, Luapula province has the highest mortality rate among children aged below five years. According to the results of the 1980 Census of Population, Housing and Agriculture in Zambia (Central Statistical Office, 1985) the estimated under-five mortality rate (U5MR) (defined as the probability of dying between birth and the age of five years) for Luapula province was about 161 deaths per every 1,000 live births. Estimates based on the 1990 census indicate that by 1990 the number of deaths among children aged below five years had increased to 199 deaths per 1,000 live births (Central Statistical Office, 1995).

A similar pattern in under-five mortality is also evident in the 1992, 1996 and 2001-2002 Zambia Demographic and Health Survey results (Gaisie, K. et al. 1993; Central Statistical Office, 1997; and, Central Statistical Office (Zambia), Central Board of Health (Zambia), and ORC Maco. 2003)). Whereas in 1992, under-five mortality for Luapula province was estimated at 244.4, by 1996 this figure had increased to 254.2 deaths which was much higher than the 1996 national average of 192.1 deaths per 1,000 live births. As at 2002, the under-five mortality in Luapula province stood at 248 deaths per 1,000 live births In short, the results of the Zambia Demographic and Health Surveys conducted so far confirm that child mortality is higher in Luapula than in any other province

Disaggregating the 1990 census data for Luapula province by district (Central Statistical Office, 1995) reveals so much variation in the rate of under-five mortality that there is an immediate and urgent need to investigate the possible contributing factors. For example, the rate of under-five mortality among the five administrative districts in the province ranges from about 173 in Kawambwa district to approximately 312 deaths per 1,000 in Samfya district with Mansa (178.3), Mwense (198.7) and Nchelenge with 218 deaths per 1,000 children aged below five years falling between the two extremes. These risks of mortality imply life expectancy at birth ranging from a high of only 43.8 years in Kawambwa district to a worrisome low of 33 years in Samfya district where, as already indicated, more than thirty percent or 1 in every 3 children does not live to celebrate the fifth birthday.

1.2 Conceptual framework

In trying to explain child mortality levels and differentials, most past studies in Africa have tended to use the traditional socio-economic and demographic framework. The

main factors emphasized in such studies include birth intervals (Ikamari, L. 1998 in Kenya; Manda, S.O. 1999 in Malawi; Bicego G, and Almad, O.B**.,** 1996), place of residence, place of delivery, prenatal visits (Brockerhoff, M., 1995; Noymer, A. 1998), immunization or vaccination status (Brockerhoff, M., 1998), parental educational attainment (Jayne, S.H. 1997; Wenlock, R.W. 1979; Mc Murray, C. 1997; Guilkey, D.K. and Jaynes S. 1997) and specific indicators of socio-economic status (Millard, A.V. 1994).

In Zambia, studies with relevant data for child mortality include the 1969, 1980 and 1990 Censuses of Zambia, the 1992 and 1996 Zambia Demographic and Health Surveys, secondary data analysis based on the Living Conditions Monitoring Surveys (1991, 1993 and 1998). In addition to these nationally representative sources of data, there have been small-scale studies which include studies by Dzekedzeke, K. (1991), Chewe(1997) and Nsemukila (1996). Other attempts to study under-five mortality in Zambia include studies by Milimo, J.T. (1997), and Simms, C., J.T. Milimo and G. Bloom (1998).

Like other studies from other parts of Africa, the studies on child mortality in Zambia have also tended to operate, almost invariably, within the traditional socio-economic and demographic framework by concentrating largely on such factors as birth intervals, birth order, traditional practices, educational level of the mother, residence, vaccination status and other socio-economic and demographic indicators.

In an attempt to transcend the socio-economic and demographic framework which has so far characterized most studies of under-five mortality in developing countries, Basic Support for Institutionalizing Child Survival (BASICS-Bolivia) in conjunction with the Ministry of Health (MOH-Bolivia) conducted a study of mortality in children under 5 years of age in El Alto, Bolivia, from December 1994 through August 1995 (Aguilar Ana Maria, 1998). In addition to the usual socio-economic and demographic factors, the study, involving 320 children, investigated: (1) the biological cause of deaths and (2) the problems encountered by care takers, including care seeking, home care and medical attention. An innovative methodology, which has been recommended for use in other parts of the developing world because of its reliability in explaining under-five mortality, was used in the study. The methodology included use of verbal autopsy and adapted anthropological procedures to identify problems in care-seeking to determine what went wrong. This study adopted a modified version of this methodology.

1.3 General objective

The general objective of this paper is to investigate how quality of care is associated with under-five mortality in Luapula province in order to recommend interventions to reduce mortality.

1.4 Specific objectives

In order to achieve the general objective, the study specifically:

    (i) Identifies predominant traditional cultural beliefs and perceptions concerning main causes of death among children below five years;

    (ii)   Assesses accessibility and quality of under-five health care services;

    (iii)   Determines the cause(s) of death for children under five years; and,

    (iv)   Makes appropriate recommendations.

1.5 Rationale/ significance of the study

The rationale or significance of this paper is that it provides data that can greatly enhance a better understanding of some of the factors associated with under-five mortality in Luapula province. Such data is important in making recommendations on possible focal points for child-survival programme intervention aimed at reducing the high rate of under-five mortality not only in Luapula province but, hopefully**,** elsewhere in Zambia. The findings of the study therefore should be of use to the Ministry of Health, Central Board of Health, District Health Management Teams in the two districts and other stakeholders such as NGOs in designing and implementing child health intervention programs and projects**.**

2. Methodology

2.1 Study sites

The study was carried out in two districts of Luapula Province, namely, Kawambwa and Samfya which were chosen on the basis that they represent two extremes in the level of under-five mortality in the province. Kawambwa has the lowest while Samfya

has the highest under-five mortality in the province. Perhaps it is worth mentioning also that the main source of livelihood in Samfya is fishing while Kawambwa is a non-fishing district.

According to the preliminary results of the 2000 Census of Population and Housing in Zambia, the population of Kawambwa district was estimated at 103,760 (50,367 males and 53,393 females) while that of Samfya was put at 166,863 comprising 82,417 males and 84,446 females (Central Statistical Office, 2001). Projections based on the 1990 census (Central Statistical Office,1995) suggest that by June 2000, the total population of children under the age of five in the two districts stood at approximately 47,907 (18,320 in Kawambwa and 29,579, in Samfya).

According to the Zambian health system, all communities are divided into health centre catchment areas that are supervised by district health management teams. Kawambwa has four such catchment areas which are sometimes called zones while Samfya has five. It was within these catchment areas/zones that the study was undertaken.

2.2 Sample selection

Data on causes of death of children under five years of age and related health care-seeking behavior were solicited from mothers or caretakers who attended to the child before death. All under-five deaths that had occurred three months before the commencement of the study together with those that occurred during the study period were eligible for inclusion in the study. Interviews with caretakers were conducted no less than two weeks and no more than three months after the child's death. A simple consent form was used for respondents for in-depth interviews.

Identification of deaths and candidates for the study was done through the use of key informants that included village headmen, health centre staff, traditional birth attendants, community health workers and members of the neighbourhood health committees in each of the health centre catchment areas.

2.3 Data collection instruments

Multiple data collection instruments were used to collect the necessary information. These included:

(a) **Questionnaire**. This was used to collect background information on the socio-economic and demographic characteristics of respondents. Before actual data

collection, the questionnaire was translated into Bemba, the local language commonly spoken in the two districts where the study was conducted. Nine (9) research (five from Samfya and four from Kawambwa) administered the questionnaire. All research assistants were recruited from the study areas and were trained before the commencement of the study. One supervisor from each district supervised these. Two support staff from each district assisted the research assistants in identifying and reporting to them deaths that had occurred in their respective communities.

(b) Verbal Autopsy/Open History. This was part of the questionnaire and was used to collect information about the illness that led to death as told by the mother or caretaker of the dead child.

c) Focus group Discussions: These were used to collect information on the community's perception of the underlying causes of under-five mortality.

(d) Medical records Review. A total of 152 cases of death that occurred in health centers during the study period were captured and analyzed by two pediatricians. The two pediatricians also analysed data from clinical records and verbal autopsies to determine the probable cause of death.

Using the above instruments, the final sample size was distributed as follows:

360 deaths were captured through the use of the questionnaire;

A total of 152 cases of death that occurred in health centres during the study period were captured (Some of these were also captured in the 360 deaths captured through the questionnaire); and,

Thirty seven (37) Focus group discussions involving approximately 157 participants were conducted.

2.4 Data processing and analysis

The Statistical Package for the Social Sciences (SPSS) was used in quantitative data entry, processing and analysis. Two pediatricians reviewed the verbal autopsy part of the questionnaire as well as clinical records in order to arrive at the probable biological cause of death. Tape-recorded focus group discussions were transcribed and analyzed.

Great caution is strongly advised against the temptation to over-generalize the findings and conclusions contained in this report because they are solely based on information about children who died. Due to various reasons, no control group was used to investigate the circumstances of children who survived. The major assumption of the study is that the conditions which the children who survived were subjected to, were better and different from those their counterparts who died had to endure.

Unfortunately, the validity of this assumption cannot be ascertained with existing data. This is a fertile ground for further research.

It is important to acknowledge also that the design adopted in this study does not allow for causal inference or measurement of risk factors. However, the value of our design is that it complements studies such as Zambia Demographic and Health Surveys analyses. We have focused on two districts and obtained information about the children who died that would be virtually impossible in a more mainstream study of child survival.

3. Study findings

3.1 Characteristics of respondents

As already mentioned, a total of 360 deaths that occurred between January 2002 and January 2003 were captured by the study. Of these 203(56.4%) were from Samfya and 157 (43.6%) were from Kawambwa.

In the majority (85%) of cases the respondent who provided information on the dead child was the mother who was usually (94%) the usual caretaker of the child before its death. The majority of the children (83.5%) had lived with both of their parents at the time of their death while only 13.3% lived with their mothers only.

Most (88.1%) of the respondents were below the age of 40 years with the largest (26.1%) concentration being in the age group 20-24 years with only about 14 percent falling below 20 years.

In terms of education, 66.3 percent had primary level of education and 17.6% had secondary level of education. Only 3.1% had no formal education. Most of the respondents were house wives (83.9%) whose main sources of livelihood ranged from farming (39.4%) to brewing local beer (17.5%), selling farm produce (10.3%), selling fish (4.2%) and sewing (5.8%). More than 50% of the respondents were Catholic with the rest being either Seventh Day Adventist (11.3%), United Church of Zambia (12.1%), Christian Mission in Many Lands (CMML) (8.5%), Pentecostal Assemblies (5.1%), New Apostolic or Watch Tower with (3.1%).

The total number of children ever born to women interviewed was 1,399 out of which more than half (53.2%) had died at the time of the survey (Table 1). More than a quarter (25.2%) of the respondents had lost a minimum of three children with the proportion being higher (30%) in Samfya than in Kawambwa where 19 percent lost the same number of children (Table 2).

Table 1:   **Number of children ever born, children dead and children still living by district of residence**

District	Number of children			Percentage dead
	Ever born	Dead	Still living	
Samfya	812	445	361	54.8%
Kawambwa	584	297	276	50.9%
None	3	-	-	-
Not stated		2	18	-
Total	1,399	744	655	53.2%

Table 2:   **Number and Percentage of children who died by district**

Number of children dead	Name of district		Total
	SAMFYA	KAWAMBWA	
One	96	82	178
	47.3%	52.2%	49.4%
Two	45	44	89
	22.2%	28.0%	24.7%
Three	28	11	39
	13.8%	7.0%	10.8%
Four	15	10	25
	7.4%	6.4%	6.9%
Five	9	4	13
	4.4%	2.5%	3.6%
Six	4	4	8
	2.0%	2.5%	2.2%
Eight	2	-	2
	1.0%		.6%
More than ten	3	1	4
	1.5%	.6%	1.1%
Not stated	1	1	2
	.5%	.6%	.6%
Total	203	157	360
	100.0%	100.0%	100.0%

3.2 Perceptions of causes of death

To determine cultural predominant cultural perceptions and beliefs concerning causes of childhood diseases, both direct and indirect questions were used. Directly, the questionnaire for caretakers contained the following closed-ended question relating to the most recent child death.

> *What, in your opinion, was the cause of the disease that led to the child's death?*

Respondents were to choose from the following alternatives: (a) Spirits, (b) Witchcraft, (c) Natural causes, (d) Other (specify) and (e) Don't know. Interviewers were instructed to explain to the respondent that "natural causes" meant causes other than supernatural ones (i.e. those not caused by spirits, ancestors, witchcraft, God etc).

Three hundred and fifty one (351) responded to this question and of these the majority (64%) attributed the cause of death to natural causes while only about 14 percent attributed it to supernatural causes. Slightly more than 19 percent did not know what the cause of the disease that led to death had been while 3 percent attributed it to other causes.

One of the themes for focus group discussions required participants to identify and discuss the major causes of diseases that were responsible for deaths among children in their communities. This was an indirect way of eliciting information on the existence of traditional beliefs about causes of child deaths in the two districts.

Rather unexpectedly, supernatural causes (e.g. spirits, ancestors, witchcraft, God) never came up during these discussions. The major causes which threaded through almost all the discussions were "objective" ones such as environmental contamination and poor health care practices.

The following summary of the proceedings of a focus group is included here because it is considered representative of other focus group discussions on perceived causes of death among children under the age of five years.

> *We lack chemicals to put in our drinking water. In addition, the food that the children eat. Some parents do not know how to care for children's food. When they cook the food, they just leave it uncovered such that flies are free to walk on it. Many times, malaria is caused by ditches where pools of water collect, and this is where mosquitoes breed. As for anemia, this is caused by lack of enough food given to the child. … In addition, during dry season, there is just muddy water left to drink. This causes diarrhea and malaria. In addition to what causes malaria, the surroundings are covered with tall grass in which mosquitoes breed. ….. Other people do not have pit latrines for attending to the call of nature. Others just dispose their waste outside behind their houses. Then flies come to the disposal waste subsequent to which they go*

and scuttle over the food. Some people are ignorant about pit latrines where they live. This type of carelessness causes this disease called diarrhea.

Although focus group discussions did not bring out much about beliefs in supernatural causes of death, they were quite useful in exposing some of the traditional cultural beliefs regarding disease causation which have no scientific basis. The following are illustrative:

❖ *For example, in some homes, one finds bed bugs which, when they bite young babies they lead to malaria as they give them high body temperature.*

❖ *The problem of coughing is caused when a child is still of tender age. Then your husband goes to have sexual affair with other women. Later on he then comes to have the same affair with you. That causes coughing. The child dies. The other cause of death to children is when the expecting mother has a disease during pregnancy. Then when the baby is born it is diseased with a disease called yellow fever.*

The existence of scientifically incorrect beliefs like the ones above may lead to delays in seeking appropriate health care or result in treatments that may be detrimental to the survival chances of a child.

One major question that arises from the above is: " to what extent can we take the above as a true representation of people's beliefs and perceptions regarding causes of death in children? Put more directly, were the respondents telling the truth? Previous studies caution us against taking respondents' answers at face value especially when the topic at hand implies dichotomizing people into modern and traditional.

It has been argued that in such situations, respondents have a tendency to tell the interviewer what they feel s/he wants to hear and not what their true beliefs or actions are. This is particularly the case when the interviewer is somebody from the medical field and is resident in the community. This was the case in this study. In such situations, the likelihood that respondents will be reluctant to admit belief in supernatural causes of death by over-emphasizing medical or so called scientific explanation of disease, is quite high.

Interestingly, the opposite tendency cannot be ruled out. Respondents may tend to over-emphasize belief in supernatural causes of death to please interviewers about how, in spite of the onslaught of Western ideas on traditional society, they still cherish and uphold traditional ideas and practices.

Did these, seemingly, opposing tendencies affect our present study? Unfortunately, this is not a simple question amenable to a simple answer. However, the fact that some respondents are willing to admit belief in supernatural causes of death suggests that not every one is out there only to please the interviewer. In any case, traditional beliefs are not necessarily antithetical to "scientific" notions and practices regarding disease and death. This is clearly demonstrated by the simultaneous and serial use of both modern/Western and traditional medicine which is quite widespread in Zambia and elsewhere in Africa.

3.3 Under-five mortality

As mentioned earlier, a total of 360 deaths were captured though the use of a questionnaire. These deaths occurred between January 2002 and January 2003. In addition, 152 deaths that occurred in modern health facilities during the same period were also analyzed.

According to valid (52) responses, only 30 (about 9%) of the deaths in the two districts were reported to have occurred during the first month after birth. Of these deaths, the majority (80%) occurred during the first two weeks with the largest concentration (46.7%) occurring less than a week after birth (Table 3). Most of the children that survived their first month of life did not celebrate their second birthday**.** Approximately 76% died before the second year of life with more than half (54%) having died before their first birthday.

Table 3:   **Number and percentage of children who died by age at death**

Age at death	Number and percentage of deaths	
	Number	Percentage
Less than 1 week	14	3.9%
1 week -2 weeks	10	2.8%
3-4 weeks	6	1.7%
1 month -11 months	174	48.3%
12- 23 months	71	19.7%
24-59 months	77	21.4%
Not stated	8	2.2%
Total	360	100%

It is perhaps pertinent to mention here also that more than 50% of the deaths in the two districts occurred at home as compared to only 35% that occurred either at a

hospital (28.6%) or at other modern health facility (6.4%). Slightly more than 10% of the deaths occurred on the way to a modern health facility.

Distance to the nearest modern health facility appears to be a good predictor of place of death. In general, as distance increases the number of deaths occurring at home also increases. For example, of the deaths that occurred at home, about 69 percent lived more than two kilometers away from the nearest health facility. Only about one third (31%) lived within two kilometers from the nearest health facility.

Some caution must be exercised against the temptation to interpret the large percentages of deaths occurring at home as indicative of parents' preference or desire to have their children die at home because some of these included those that:

(a) Were referred to other institutions but, due to various reasons, could not reach these institutions;
(b) Were sent home after being attended to at a modern health facility but ended up dying at home;
(c) Resulted from the caretakers' inability to recognize the seriousness of illness thereby delaying seeking professional help;
(d) Were sudden.

3.4 Causes of death among children

To determine the probable causes of death among children under the age of five years in the two districts, the following procedures were adopted:

(a) Care takers of the dead child(ren) were asked to indicate what they thought was the cause of death of the child(ren);
(b) Participants in focus group discussions were asked to identify the main causes of death to under five children in their community;
(c) Clinical records were obtained from health centers. These were later analyzed by medical experts; and
(d) Two pediatricians analyzed symptoms mentioned by the caretakers in the verbal autopsies to determine the probable cause of death.

Based on the caretakers' responses (Table 4, column 2), close to 35% of the deaths in the two districts were attributed to diarrhea and malaria with the largest (23.9%) of the deaths suspected to have been caused by diarrhea. It is clear from data above that some caretakers identified symptoms (i.e. fever, cough, convulsions) and not illnesses as causes of death.

According to the two experts who analyzed verbal/social autopsies, the four major causes of death among children under the age of five years in the two districts are malaria, malnutrition, pneumonia and diarrhea, in that order. The predominance of these diseases in the two districts was further confirmed by analysis/review of clinical records.

Table 4:   Proportion of children who died due to various suspected causes of death according to caretakers and experts

Cause of death	Caretakers	Expert 1	Expert 2
Diarrhea	23.9	11.7	15.6
Malnutrition (PEM)	5.0	16.4	16.7
Pneumonia	4.4	12.8	15.3
Malaria	10.8	26.7	24.2
Fever	4.7	-	-
Cough	6.1	-	-
Anaemia	6.9	5.8	2.5
Convulsions	3.6	-	-
Witchcraft	2.5	-	-
Measles	0.6	1.7	1.9
T.B.	0.8	0.6	1.4
Meningitis	-	7.5	6.1
Septiceamia	-	7.5	8.9
Other	11.4	5.8	3.9
Not stated	19.2	3.6	3.6

3.5 Quality of care

In our study, distance to the nearest health facility, time it takes to be attended to, source of care on the day of death and diagnosis and type of treatment provided by modern medical caregivers are some of the indicators used to measure quality of health care.

With regard to distance, our data (Table 5) indicate that only about 22% of the respondents in the two districts lived less than one kilometer away from the nearest modern health facility. The greatest majority (64.5%) lived no less than two kilometers away from the nearest health facility with approximately 24% residing more than ten kilometers away.

Table 5:   Distance to the nearest modern health center by district

Distance to health center	District		Total
	SAMFYA	KAWAMBWA	
Less than 1km	36 (17.9%)	33 (28.0%)	69 (21.6%)
Between 1Km but less than 2 kms.	24 (11.9%)	20 (16.9%)	44 (13.8%)
2 kms and above but less than 5 kms	58 (28.9%)	27 (22.9%)	85 (26.6%)
Between 5 kms but less than 10 kms	32 (15.9%)	12 (10.2%)	44 (13.8%)
10 kms and above	51 (25.4%)	26 (22.0%)	77 (24.1%)
Total	201 (100%)	118 (100%)	319 (100%)

Table 6:   Time it takes to get to the nearest modern health center by district of residence

| District | Time to travel to the nearest health facility | | | |
| | Less than 1 hour | 1-2 hours | More than 2 hours | |
				Total
Samfya	4	66	82	194
	(23.7%)	(34.0%)	(42.0%)	(100%)
Kawambwa	75	37	41	153
	(49.0%)	(24.2%)	(26.8%)	(100%)
Total	121	103	143	347
	(34.9%)	(29.7%)	(41.2%)	(100%)

Table 7:   Time it takes to be attended to at a modern health facility by district of residence

| District | Time it takes to be attended to | | | Total |
	Less than 30 minutes	30-59 minutes	More than one hour	
Samfya	29	58	107	194
	(14.9%)	(29.9%)	(55.5%)	(100%)
Kawambwa	70	15	64	149
	(47.0%)	(10.1%)	(43.0%)	(100%)
Total	99	73	171	343
	(28.9%)	(21.3%)	(49.9%)	(100%)

As result of distance, large proportions of caretakers are forced to spend many hours to get to the nearest health facility and this is particularly the case in Samfya. Table 6 shows this. Whereas in Kawambwa the proportion of mothers residing within less than one hour to the nearest health facility is about 49%, the corresponding proportion among those in Samfya is only about 24%. More (42%) mothers in Samfya than (26.8%) in Kawambwa have to travel more than two kilometers to reach the nearest modern health facility. This may contribute to the reluctance by caretakers to seek modern assistance, even at critical times, and may consequently result in unnecessary deaths of children. Below are but two examples.

❖ *We were traveling to Bwalya Mponda (a village in Samfya) to sell poles for building when the child fell sick. The child started having diarrhea and pneumonia. We traveled for 5 days to reach the hospital and on the 6th day that is when I took the baby to the hospital. By then, it was already tired and the eyes had sunk. I was admitted and the child was given medicine and put on a drip. There was nothing that happened because the following day around 12.30 hours, the child died.*

❖ *I saw that my child started purging blood and vomiting at 16.00 hours. I failed to take the child to the clinic at that very time because of the long distance from the clinic. I only got traditional medicine from my friend. While I was preparing myself to go to the clinic the following morning the child died at about 07.00 hour.*

The problem of getting to modern health facilities is compounded by the time it takes for the caretaker to be attended to and this is evident in Table 7. Of the valid cases that were accepted for analysis, only about 28% were reportedly attended to in less than 30 minutes and the proportion is even less (15%) for residents of Samfya compared to those in Kawambwa. Incompetent staff and understaffing of health facilities may be some of the factors contributing to the problem of modern health seekers being subjected to long hours of waiting before being attended to at a modern health facility.

A comparison of data in Tables 6 and 7 suggests that using geographical distances as a measure of accessibility to health facilities, which is commonly done in analyses of, say, Demographic and Health Surveys, the more so now that Global Positioning Systems can be integrated with Demographic and Health Survey data, may be misleading. This arises from the fact that, although health centers in Samfya tend to be slightly further away in distance terms than they are in Kawambwa, the difference between the two districts is not very great. The difference in terms of time taken to reach the health facilities (Table 6) is, however, much greater. Nearly half (49%) of

Kawambwa residents could get to the health facility in less than one hour, compared with less than a quarter (24%) of the residents of Samfya.

Time it takes to get to health facilities, coupled with the delay in being attended to may, to a very large extent, explain why most mothers (Table 8) in the two districts delayed seeking medical care for their children. Overall, more than half (54.2%) of caretakers delayed seeking modern health care for their children for not less than two days. The picture is not very different between the two districts.

Table 8: **Proportion of caretakers who delayed seeking modern health care by number of days and district**

Days before seeking modern care	District		
	SAMFYA	KAWAMBWA	Total
One day	58 (28.6%)	55 (35.0%)	113 (31.4%)
Two days	49 (24.1%)	37 (23.6%)	86 (23.9%)
Three days	20 (9.9%)	24 (15.3%)	44 (12.2%)
Four days	17 (8.4%)	12 (7.6%)	29 (8.1%)
Five days	5 (2.5%)	2 (1.3%)	7 (1.9%)
Six days	1 (0.5%)		1 (0.3%)
Seven days	11 (5.4%)	4 (2.5%)	15 (4.2%)
More than 7 days	6 (3.0%)	7 (4.5%)	13 (3.6%)
Can't remember	36 (17.7%)	16 (10.2%)	52 (14.4%)
Total	203 (100%)	157 (100%)	360 (100%)

It would be misleading to conclude from the above that distance and waiting time are the only factors responsible for caretakers' delay in seeking modern health care for their children. Lack of confidence in, or ignorance about, the effectiveness of modern medicine, as well as failure by caretakers to identify danger signs are some of the other factors.

3.6 Source of care

As already indicated above, type/source of care is another indicator of quality of care used in this paper because it indirectly shows the confidence people have in different sources of care for their children. Table 9 shows data on the sources of health care sought during the illness leading to a child's death.

Table 9: **Number and percentage of care takers by source of care during child's illness that led to death**

Source of care for the child	Frequency of contact		
	First to be contacted	Most contacted	Contacted on the day of death
Traditional Healer	17 (5.1%)	20 (6.0%)	12 (3.3%)
Religious leader	3 (0.9%)	2 (0.6%)	81 (24.3%)
Modern health facility	259 (77.8%)	281 (84.4%)	153 (45.3%)
Private physician	5 (1.5%)	5 (1.5%)	9 (2.7%)
Another provider	8 (2.4%)	8 (2.4%)	41 (11.4%)
Outside home	26 (7.8%)	12 (3.6%)	59 (16.4%)

Approximately 78% of caretakers consulted a modern health facility first when the child fell sick and in more than 84% of cases, this was reportedly the most frequently consulted source of health care during the duration of illness that led to death. However, on the day the child died, only 45.3% of caretakers reported consulting a modern health facility. On the other hand, the proportion who consulted a religious leader on the day of death was 24.3%. This represents a tremendous increase from the less than one percent who first consulted this source of health care. It is also higher than the less than one percent, who, during the child's illness, consulted this most frequently.

One possible interpretation of the above is that confidence in the quality and effectiveness of modern health care tends to wane when the situation of a child becomes desperate and death is imminent. Consequently, people turn to some supernatural power as a last resort. This is particularly the case after consulting with the modern medical system several times with no improvement in sight.

An alternative interpretation is that many parents contacted a religious leader (e.g. a priest) when their children were dangerously ill and not expected to live in order for some religious ceremony to be performed prior to death. It must be remembered that more than 50% of the respondents in the sample were Catholic and therefore turned to a religious leader for the sacrament of anointing of the sick. In short, these parents were not seeking cure for their children from the priest but were possibly asking the priest to bless the child as it departs this earthly life.

Since there was no follow-up question on why a certain course of action was taken, it is not possible to determine confidently which of the two interpretations for the behavior of the parents on the day the child died is correct. What is perhaps more important to highlight from the above findings is the simultaneous use of different types of treatment which may undermine or compromise the effectiveness or efficacy of modern health care thereby reducing the survival chances of children in the two districts.

3.7 Diagnosis and treatment

According to professional/expert opinion based on the analysis of the 152 clinical records of children who died, a number of wrong diagnoses of the illness were made and, subsequently, wrong treatment was administered. On average, about 29 (19%) cases were wrongly diagnosed and in 62 (approximately 41%) cases, wrong treatment was administered representing quite a substantial proportion of all the cases. The following may be a case of death arising from wrong treatment having been administered.

> ❖ *The child had a fever. I took him to the clinic and was prescribed five injections. He was given all the five injections. After a week, I went back to hospital and was prescribed another five injections but still the child was not okay. I was referred to Kawambwa Central clinic, after that I was referred to Kawambwa District Hospital where he was again put on injections but the fever was still high. This time the child was looking pale. He was given blood, but the condition remained the same. He continued with fever and had convulsions until he died.*

Since most deaths occur at home, the number of wrong treatment resulting in death could even be higher thereby contributing, in no small way, to the high under-five mortality in the two districts.

It is perhaps pertinent to mention here that, of the valid responses, only 34.7% (29.7% in Samfya and 40.6%) believed that something could have been done to prevent death of the child. This suggests that a substantial number of people have very little confidence in the quality of health care available in the two districts.

4. Discussion, summary, and recommendations

This study was intended to investigate some of the factors that may be associated with the high under-five mortality in Luapula province with particular emphasis on two districts i.e. Kawambwa and Samfya using a triangulation of methods. The following are the salient findings of the study and some recommendations aimed at improving the situation.

One of the findings of this study is that the major killer diseases in the two districts are malaria, malnutrition, pneumonia, malnutrition and diarrhoea. All of these diseases are preventable and treatable. In order to reduce deaths arising from these diseases, the following measures are strongly recommended:

- ❖ *Promotion of use of insecticide treated mosquito nets especially in areas where malaria is the main problem. Government policy in this regard should be to further reduce tax on mosquito nets so that most people can afford.*
- ❖ *Campaigns to educate communities on the importance or benefits of boiling or chlorinating drinking water as well as keeping their environments clean. This is particularly pertinent in areas where diarrhoea is prevalent. A policy aimed at subsidizing the cost of chlorine is therefore necessary. At the same time, government or local authorities should not abrogate their responsibilities to provide clean and safe water to the communities.*

Inability of some caretakers to properly diagnose disease and take proper and timely treatment has also been identified as a major factor implicated in the high under-five mortality in the two districts. In this vein, there is need to educate mothers on the danger signs of the most common diseases and the need to seek professional help as soon as these are noticed. Such education could be imparted by health personnel through Integrated Management of Childhood Illness (IMCI) committees which should be established in every community. Such committees could also be used as vehicles to impart knowledge on health and nutrition to communities.

Another important finding emerging from this study is that a number of deaths in the two districts could have been averted if proper diagnosis had been done and right treatment administered to children who died. As indicated earlier, a good number of children who died did so due to wrong diagnosis and wrong treatment. This is despite the fact that some caretakers had taken the necessary preventive and curative measures. To address this problem, there is need for Government to ensure that health posts are only manned by qualified staff while at the same time improving existing health workers' skills, especially in integrated management of childhood diseases, through staff development. Further more, there is need for health posts to be constantly supplied with adequate and right drugs. Some of the wrong treatments identified in this study could have been due to lack of right drugs in these health centers. In such instances, health workers have little choice but to give whatever is available to them.

It is also highly recommended that government urgently looks into the issue of introducing more health posts as close to the people as possible. This recommendation arises from the fact that in a number of cases, distance to modern health centers, time it takes to reach these centers and be attended to, tend to discourage caretakers to seek modern medical care resulting in death of children.

Another area that needs attention is the frequently reported attitudes and behavior of some modern health care providers which has been found to be closely associated with reluctance by caretakers to seek professional care in case of a child falling sick. As a consequence, some mothers turn to traditional medicine or seek professional care only when the situation has become hopeless. This contributes to high under-five mortality. There is therefore need to educate caregivers on the importance of good public relations.

Considering the role of the traditional health sector in the provision of health services, it is important to provide basic health education to traditional healers. Regular workshops or seminars on disease identification and treatment as well as the importance of collaborating with the modern health sector cannot therefore be over-emphasized.

5. Acknowledgements

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