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MORTALITY LEVELS, PATTERNS AND DIFFERENTIALS IN ZAMBIA

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INTRODUCTION

1. In almost all developing countries, the general mortality level has been falling particularly after World War II as a result of efforts by governments and international bodies to effectively control hunger, disease and squalor, and thereby improve the general standards of living. Notwithstanding this decline, mortality levels are still high in many developing countries and because of total or partial absence, or indeed poor quality of demographic data, it is difficult to identify the levels, patterns, differentials and trends of mortality in these countries.

2. In Africa South of the Sahara, mortality levels are among the highest in the world. Crude death rates for countries in this region are about 20 per thousand population and infant mortality rates exceed 100 per thousand births. A peculiar feature of mortality in this region is the persistence of the high incidence of second year deaths. In fact, it has been estimated that about a third of all children born in countries of tropical Africa die before they attain the age of five. Deaths to children under five constitute a significant proportion of total deaths. This high level of infant and childhood mortality explains the relatively short average life span (about 50 years) estimated for sub-Saharan African countries. Attempts have been made in census and surveys to classify mortality data by the socio-economic characteristics of the respondent - usually the mother in surveys focussing on infant and childhood mortality. However, the absence of reliable and complete vital registration rules out significant improvements in the estimates of average life span and other mortality indicies in those countries.

3. Estimates of mortality in Zambia derived from various censuses and surveys have shown that mortality is still very high in Zambia. The predominance of high infants and childhood mortality in this country has focussed the attention of policy makers on suitable policies for reducing these high rates. Thus, health planners and health personnel have been preoccupied with methods and programmes suitable for reducing current high levels of infant and childhood mortality. In the years following the attainment of independence, the adoption of a mass public health policy and the expansion of vaccination campaigns against the major killer diseases such as small pox, yellow fever, measles and whooping cough, to name only a few, resulted in significant decreases in infant and childhood mortality. However, in recent years concern has been expressed as to whether mortality rates are actually declining in Zambia and other sub-Saharan African countries.

4. In Zambia, as in other developing countries, estimates of mortality levels especially at infant and early childhood still suffer from lack of adequate demographic data. The registration of births and deaths is not complete because most of them are not reported. A number of reasons explain the low reporting of births and deaths in Zambia as in any other African country. Firstly, the vital registration system is relatively new in Zambia and the practice of registering African births and deaths was started in urban areas several years after independence.1/ Secondly, there are no registration offices in most localities to facilitate the development of the system among the population. Thirdly, even where a registration office exists, the persistence of traditional beliefs about births and deaths discourage people from declaring these events when they occur.

5. This paper analyses levels, patterns and differentials particularly of infant and early childhood mortality. As already mentioned there is no comprehensive vital registration system in Zambia capable of providing reliable vital rates. Indirect mortality estimation techniques, particularly those developed by Brass and Sullivan, have been employed to derive estimates of infant and childhood mortality as well as general level of mortality.

Source of Data

6. The data used for this analysis were obtained from retrospective and prospective information on mortality in the households covered in this survey. The retrospective data were obtained from information on deaths which occurred in the households during the twelve months preceding the survey. The prospective data were obtained from information on deaths which occurred in the household during the period covering all the four rounds. Related information on the availability and use of medical services was also collected.

7. The analysis necessarily focuses on the infant and childhood mortality and factors that are related to it. In this study, data on cause of death, number of rooms in household, water supply and toilet facilities are used to analyse variations in mortality by place of residence. Finally, data on maternal socio-economic characteristics are also used to explain differentials in infant and childhood mortality levels.

1/ Note: The Registration of Births, eaths and Marriages Act was amended in 1973 to extend coverage to Africans.

Mortality Levels

8. Cross-tabulations based on data from the survey have been used to estimate infant and childhood mortality as well as general mortality rates. The evaluation of the data does not form part of this paper since it is discussed in another paper. Nevertheless, it cannot be over-emphasized that the data are subject to limitations characteristic of demographic sample surveys. These limitations are due to the fact that the events we deal with are not only rare but under reported as well. In this regard the estimates of mortality derived through indirect techniques may be well below the true mortality levels (see Appendix 1).

9. Table 1 presents mortality estimates derived from prospective data on reported deaths that occurred during the survey period. The age specific mortality rates in Table 1 show that Zambia is still characterized by high mortality. The general mortality level as indicated by the crude death rate is higher in rural than urban areas; 20.7 as against 6.5* per 1,000 population. The infant death rates were 120.3 and 36.5 for rural and urban areas respectively. This high crude death rate implies an expectation of life at birth which ranges from 41-44 and 45-48 years for males and females respectively. It should be pointed out that this rather low expectation of life at birth contrasts sharply with what obtains in more developed countries where it is now well over 70 years. Whereas children born in the developed countries, all things being equal, can at least attain the Biblical Life Span of "three score and ten years"; Zambian children have a long way to go in order to achieve that objective.

Table 1: Estimates of mortality rates based on prospective data, Zambia.

Locality	Age specific mortality rates per 1000 population					
	Under 1	1-4	5-9	10-14	15+	Crude death rate
Rural	120.3	30.7	6.3	7.3	21.0	20.7
Urban	36.5	12.7	1.1	2.2	4.3	6.5

10. The proportion of deaths of children under 5 years out of total deaths is also used to indicate the high level of childhood mortality prevalent in Zambia. Table 2 presents proportions of deaths to children under 5 years in Zambia and two selected developed countries, Sweden and United Kingdom. For both urban and rural areas it is seen that childhood mortality comprises quite a sizeable proportion of total deaths; 62.5 as

* This rate is rather low and must be affected by response errors.

against 43.6 per cent in urban and rural areas respectively. The corresponding percentages were 1.5 and 2.3 per cent in Sweden and United Kingdom respectively. Whereas a significant proportion of deaths is concentrated in young ages in Zambia, the reverse is the case for Sweden and the United Kingdom.

Table 2: Proportions of deaths by age in Zambia and selected developed countries.

Age at death	Zambia, 1978		Sweden*	United Kingdom*
	Urban	Rural	1973	1973
Under 1	25.0	21.8	1.3	1.9
1-4	37.5	21.8	0.2	0.4
5-9	3.1	5.5	0.2	0.2
10 and over	34.4	50.9	98.3	97.5

* Source: Percentages for Sweden and United Kingdom (England and Wales) were based on figures from 1974 Demographic Yearbook, New York, 1975 pp. 598-600.

11. A major feature of high mortality countries is the relatively high incidence of pregnancy wastage. This usually is related to the problems of poor nutrition among pregnant women and the absence or inadequate ante-natal services. A review of the retrospective data on pregnancy histories presented in Table 3 shows a significant percentage of pregnancy wastage. These data are however not very accurate since they relate to differing periods in the past.

Table 3: Percentage of pregnancies that did not end in live both in urban (Lusaka) and rural (Keembe) areas.

Locality	Pregnancies	Wastage No.	Per cent
Urban (Lusaka)	1029	89	8.6
Rural (Keembe)	3163	300	9.5

12. Table 4 presents pregnancy outcome by place of residence for all pregnancies reported during the survey period. The higher rural than urban mortality, already noted above, is also evident in Table 4. Comparison of the standardized foetal death ratios shows that the rural figure is 3.6 per cent higher than the urban figure. This however, is a conservative estimate since foetal deaths are more likely to have been under-reported in rural than urban area.

Table 4: Pregnancy outcome by place of residence.

Locality	Live birth	Foetal deaths	Foetal death ratio per 1000	Standardized foetal death ratio per 1000
Urban (Lusaka)	216	16	74	73.4
Rural (Keembe)	15	1	66	76.1

Nevertheless they are very high when compared to ratios for Panama (67.4 for 1973); USA (12.7 for 1972), and Reunion (50.1 for 1969). 2/

13. Table 5 shows estimates of $_2q_o$ $_3q_o$ and $_5q_o$ (probabilities of dying from birth to exact ages 2,3 and 5) based on data on children ever born and surviving for each sex separately and for rural and urban areas. Contrary to expectation the q(a) values decrease with age and this may be attributed in part to omission and sampling errors. Nevertheless, if $_2q_o$ is taken as the best index of child mortality it is clear that child mortality is relatively high in Zambia. For instance, 142 children out of 1,000 births die before their second birthday. It is also noted that irrespective of sex children born in rural areas experience higher child mortality than their counterparts in the urban areas.

Table 5: Estimates of probabilities of dying before exact ages 2, q(2), 3, q(3) and 5, q(5).

Locality	$_2q$ Male	$_2q$ Female	$_3q$ Male	$_3q$ Female	$_5q$ Male	$_5q$ Female
Urban (Lusaka)	0.082	0.079	0.082	0.065	0.094	0.079
Rural (Keembe)	0.142	0.083	0.133	0.106	0.115	0.098

14. Estimates of probabilities of dying by exact ages 2,3 and 5 years based on Sullivan's multipliers are presented in Table 5 for the three urban residential areas. Although the male q(a) values display an erratic pattern they suggest that male child

2/ United Nations, 1974 Demographic Yearbook, New York, 1975.

mortality was lowest in high density areas while it was relatively high in both low density and squatter areas. On the other hand, female children in low density areas experienced much lower child mortality than their counterparts in squatter areas. High density areas occupied an intermediate position.

Table 6: Estimates of q(2), q(3) and q(5) for the three urban residential areas.

Locality	Male $_2q$	Female	Male $_3q$	Female	Male $_5q$	Female
Low density	0.088	0.031	0.079	0.030	0.030	0.012
High density	0.068	0.046	0.067	0.052	0.092	0.056
Squatter	0.089	0.098	0.093	0.080	0.113	0.114
Total	0.082	0.079	0.082	0.065	0.094	0.079

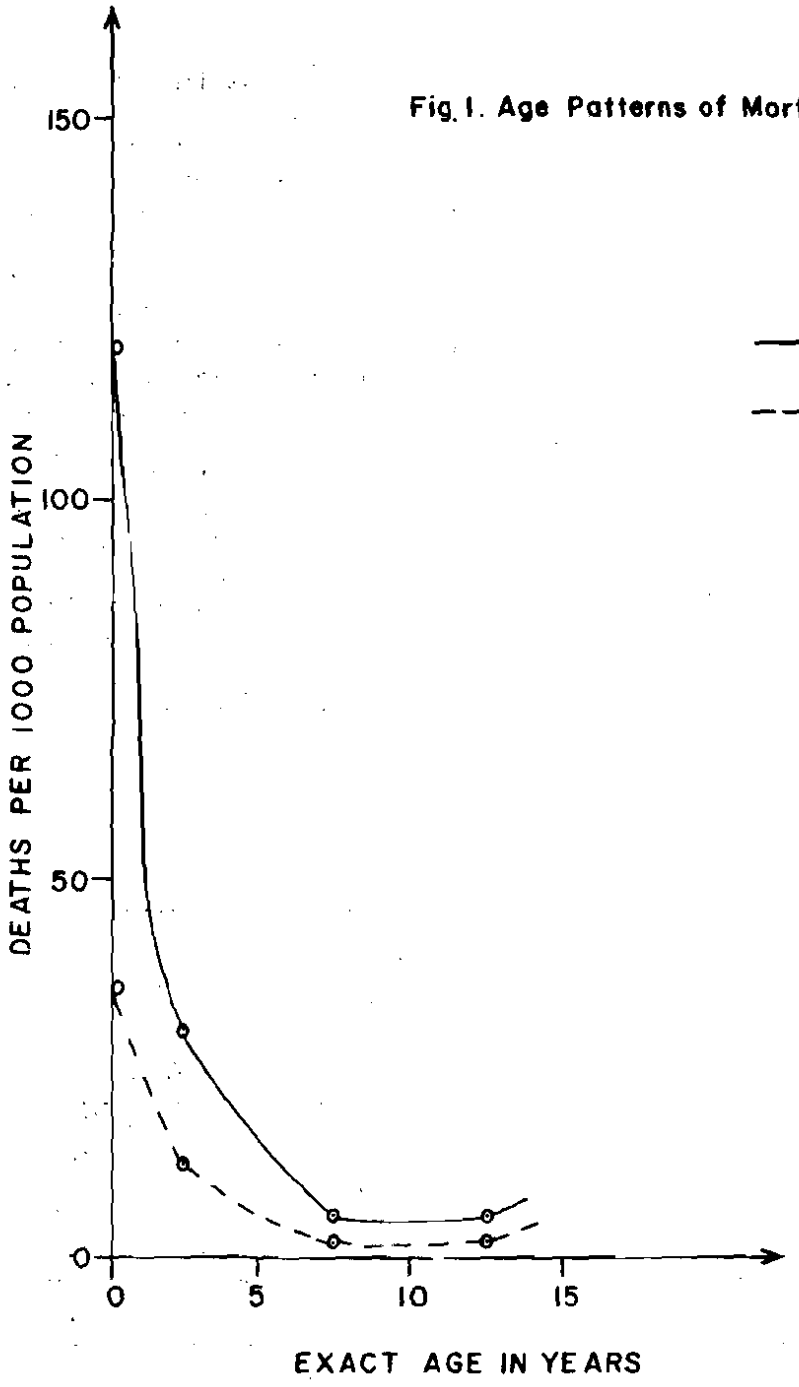
Mortality Patterns

15. Cantrelle 3/ has claimed that there is a standard pattern of tropical mortality whereby the probability of dying between age 1 and 5 years is often of a similar magnitude to that between birth and age 1. To some extent mortality data from West Africa seem to support Cantrelle's contention. However, the age pattern of mortality for persons under 15 years plotted in Figure 1 shows relatively higher mortality at infancy and a sharp drop before age ten. However, the difference in urban and rural mortality at these younger ages was most pronounced among children under five; although a difference persists after ten years of age.

16. Analysis of mortality by sex shows the universal pattern of higher male than female mortality for both urban and rural areas. Infant mortality rates were 68.3 and 62.9 per 1,000 live births for males and females respectively in the urban areas; the corresponding figures for the rural areas were 125.4 and 70.3. These figures also suggest that there is relatively larger sex mortality differential in areas of high mortality.

3/ Cantrelle, P. (1974) 'Is there a standard pattern of tropical mortality ?' in Population in African Development, IUSSP, vol. 1, pp. 34-42.

Fig. 1. Age Patterns of Mortality for rural and urban areas.



17. Mortality is influenced by many factors 4/ prominent among them are morbidity, environmental, nutritional and personal behaviour factors. As far as weather and climate are concerned it has been shown that moderately hot conditions increase susceptibility to intestinal disease and that moderately cold conditions increase susceptibility to respiratory diseases. The survey period covered a year of different climatic conditions and a modest attempt is made to shed some light on seasonality of deaths. Table 7 presents seasonal pattern of mortality. It is seen that irrespective of age at death a greater proportion of deaths occurred during the wet season, December to March. For infants the wet and cold seasons caused the greatest havoc while for older ages the dry season accounted for greater proportion of deaths. It is also noted that a greater proportion of deaths among children aged 1-4 occurred during the wet season. This seasonal pattern of mortality has been observed in West Senegal and Western Gambia. 5/ In West Senegal mortality is excessively high in the rainy season while in Western Gambia it is higher during the dry season. It would seem that food shortages, especially during the early part of the wet season, may also aggravate conditions contributing to higher mortality.

Table 7: Seasonal pattern of mortality.

AGE	SEASONS							
	DRY (Aug-Nov)		WET (Dec-Mar)		COLD (Apr-July)			
	No	%	No	%	No	%	TOTAL	
0	5	17.9	13	46.4	10	35.7	28	100.0
1-4	11	33.3	15	45.5	7	21.2	33	100.0
5-9	2	40.0	2	40.0	1	20.0	5	100.0
10-14	3	50.0	2	33.3	1	16.7	6	100.0
15+	17	38.6	18	40.9	9	20.5	44	100.0
Total	38	32.8	50	43.1	28	24.1	116	100.0

4/ Pollard, J.H., 'Factors affecting mortality and the length of life', a paper presented at the Conference on Population in the Service of Mankind, 8-15 July, 1978, Vienna, Austria.

5/ Pierre Cantrelle, IUSSP, 1974 op.cit. p. 41.

18. Table 8 presents pattern of causes of death for the survey population. Although non-medical personnel collected the cause of death data and therefore the data may be far from accurate, they nevertheless, indicate, in a broad fashion, the magnitude of the health problems which public health administrators have to grapple with. Among infants diseases due to high temperature accounted for 30.1 per cent of infant deaths while diarrhoea, vomitting, stomach pains and dehydration were the second major killers. Among children aged 1-4, diseases due to high temperature and measles accounted for more than half of total deaths. It is interesting to note that a study of infant deaths in Lusaka and Central Provinces also found that "the group of respiratory, parasitic and infectious diseases accounted for 26 per cent of infant deaths".6/ It is clear from the above that infectious and parasitic diseases and malnutrition still dominate the mortality scene in infancy and childhood in Zambia. It may be pointed out that this cause of death pattern exhibited by the Zambian data is similar to what has been found in a number of developing countries.7/

Table 8: Distribution of deaths by cause and age at death, for Lusaka and Keembe.

Cause of Death	Under 1 year		1 - 4		5 and over	
	No	%	No	%	No	%
Coughing	52	8.2	43	5.8	1	0.8
High temperature	192	30.1	150	20.1	43	32.8
Accident or wound	7	1.1	14	1.9	21	16.0
Measles	32	5.0	171	23.1	15	11.5
Lack of milk	6	0.9	1	0.1	-	-
Smallpox	3	0.5	9	1.2	1	0.8
Diarrhoea, vomitting stomach pains dehydration	97	15.2	138	18.6	11	8.4
Swollen legs	12	1.9	31	4.2	4	3.1
Yellow fever	7	1.1	3	0.4	2	1.5
Eye sickness	1	0.2	2	0.3	-	-
Bilharzia, urinating blood	5	0.8	5	0.7	-	-
Not known	223	35.0	116	15.6	33	25.1
Total	637	100.0	741	100.0	131	100.0

6/ Banda K.A.,"Levels, patterns and differentials of mortality in Zambia", p. 121; M.A. thesis University of Ghana 1977.

7/ Ministry of Health and WHO, Infant and early childhood mortality in relation to fertility patterns, p. 112, Freetown, 1980.

Mortality Differentials

19. As already noted, the high general mortality in developing countries including Zambia is mainly due to relatively high infant and early childhood mortality. Needless to say that there is paucity of information on adult mortality. In the light of the above considerations analysis of mortality differentials will be mainly based on infant mortality. It is noteworthy that the level of infant and childhood mortality in a society is indicative of the level of development as well as standards of sanitary and health conditions.

20. Estimates of life expectancy based on $_2q_0$ values for urban and rural areas are presented in Table 9. These estimates show that irrespective of sex mortality is higher in rural than urban areas. Comparison of the results from the two surveys also shows that there has been a marked improvement in mortality conditions between the two survey periods and that males have benefited more than females. This is to be expected in view of the relatively high expectation of life at birth already enjoyed by females at the time of the 1974 survey. For instance, males in urban areas live twelve more years than their rural counterparts

Table 9: Estimates of life expectancy (e_0) based on q_2 of survey data and the results of 1974 sample census.

Locality	1978/79 ECA/CSO survey		1974 CSO sample census a/	
	Male	Female	Male	Female
Rural	46.5	58.8	44.8	48.0
Urban	58.8	60.8	53.7	57.3

Source: (a) Banda K.A., op.cit. p. 152

21. It should be mentioned that apart from the rural-urban mortality differential which has been observed in many developing countries, there are mortality differentials among different areas of the same city. Table 10 presents estimates of infant mortality rates for the three residential areas in Lusaka. It is important to note that these estimates are affected by varying degrees of omission and sampling errors and therefore they should be interpreted with great caution. Contrary to expectation the male infant mortality rates show higher mortality in low density than high density areas. The low density areas are inhabited predominantly by higher income groups, the domestic servants and other low income group people also live in these areas and it is expected that, all things being equal, infant mortality will be lower here than in the other two residential areas. It may well be that differential

reporting of male deaths partly accounts for this phenomenon. It should be added that data on deaths in the last twelve months show higher infant death rate in high density than low density areas.

22. The female infant mortality rates, although too low to be true, show that children born in the low density area experience much lower mortality than their counterparts in the other two residential areas. Mortality in the squatter areas is almost three times as high as it is in the low density areas. It must be mentioned that the implied life expectancies are rather on the high side and, as already noted, may be due to omission and sampling errors.

Table 10: Estimates of infant mortality rate and life expectancy based on $_2q_0$ values.

Urban Residence	I M R		e_0^0	
	Male	Female	Male	Female
Low density	83.0	27.6	55.3	71.5
High density	58.4	39.8	61.3	67.5
Squatter	84.1	78.0	55.1	56.8

23. In another study it was shown that where better housing facilities such as tap water, flush toilet, brick houses and electricity supply were available, mortality conditions were more favourable.8/ Many other studies have also shown that the level of mortality was related to such variables as food consumption patterns, fertility, migration, rate of population growth, family and household composition, health care, and housing conditions. Mortality is higher among Slum dwellers, in households where employment and working conditions are poor, where income levels are low or where individual security and status are not guaranteed.9/ Data presented in Table 11 suggest that these interrelationships also exist in the case of Zambia.

8/ Banda, op.cit., p. 153-156.

9/ United Nations, The mapping of interrelationships between population and development, New York, 1981.

Table 11: Interrelationships between mortality and selected housing facilities.

Residence	2^{q}_{o} (1000 females)	Housing facilities (per cent of households)										
		Water supply						Toilet facilities				
		Average rooms	Tap	Well	Liver	Not Stated	Total	Flush	Pit	None	Not Stated	Total
Low density	31	6.19	100.0	-	-	1	193	100.0	-	-	1	193
High density	46	2.35	99.3	0.7	-	2	459	90.8	9.2	-	-	459
Squatter	98	2.83	99.2	0.8	-	5	722	-	92.1	7.9	-	722
Rural	88	2.64	4.6	92.3	3.1	-	388	-	49.2	50.8	-	388

24. The application of the Sullivan mortality estimation technique to survivorship data shows considerable omission errors which make the childhood mortality estimates very unreliable for comparison purposes. In the light of the above consideration analysis will be based on proportion of dead children. These data which are presented in Table 12 show that in rural Keembe and Lusaka increasing level of education is associated with a consistent and significant fall in the level of mortality. Thus, 58.2 per cent of the dead children in Keembe had mothers who had never been to school, while the corresponding percentage for Lusaka was 43.4. It is interesting to note that the mortality differential between women with no education and those with secondary and higher education was more pronounced particularly in Keembe than in Lusaka. This suggests, that under high mortality conditions a women's educational attainment has relatively more effect on mortality than under lower mortality conditions. Similar findings have been reported for a wide range of countries. 10/

Table 12: Proportion of children dead among children ever born by level of education of mother, Keembe and Lusaka, Zambia.

	Rural (Keembe)		Urban (Lusaka)	
Level of education	Number of dead children	Per cent	Number of dead children	Per cent
No education	249	58.2	481	43.4
Grade 1-4	142	33.2	366	33.0
Grade 5-7	34	7.9	206	18.6
Secondary and higher	3	0.7	56	5.0
Total	428	100.0	1109	100.0

10/ J.C. Caldwell and P.McDonald, "Influence of maternal education on infant and child mortality, levels and causes", in proceedings of IUSSP General Conference, Manila, Philippines, December 1981 pp. 79-96.

Eduardo E. Arriaga, Direct estimates of infant mortality differentials from birth histories. Substantive findings session No. 6. paper No. 1. World Fertility Survey Conference, London 7-11 July, 1980.

25. Analysis of proportions of dead children among children ever born for the separate residential areas substantiates the inverse relationship between mortality and the level of maternal education already noted above. Table 13 presents deaths per 1,000 children ever born to women in the four survey areas. Although the rural pattern is erratic and may probably be due to very few children born to women with secondary and higher education, the general pattern of higher survivorship of children whose mothers had considerable education is evident. It is noted that children born to mothers without any formal education in high density areas experience a mortality rate which is 300 per cent above that of their counterparts whose mothers had secondary and higher education.

Table 13: Deaths per 1,000 children ever born towomen in the four residential areas by level of maternal education.

Level of education	Low density	High density	Squatter	Rural (Keembe)
No education	87.5	126.4	146.6	133.0
Grade 1-4	61.5	98.6	102.7	140.0
Grade 5-7	52.0	65.8	55.6	96.6
Secondary and higher	41.2	42.0	49.4	130.4
Total	52.2	87.2	131.2	
	Mortality Ratios			
Secondary and higher	100	100	100	
Grade 5-7	126	157	113	
Grade 1-4	149	235	208	
No education	212	300	297	

26. Table 14 shows deaths per 1,000 children ever born by marital status of women. Contrary to expectation children of never married women have higher survivorship than their counterparts born to widows, married, divorced and separated women. This pattern holds good irrespective of place of residence. It is also noted that children of married women experience lower mortality than children of widows, divorced and separated women. The data in Table 14 also suggest that in rural Keembe children born to divorced and separated mothers are the most disadvantaged while in the urban areas the children of widows experienced higher mortality than other children. In most cases, the loss of a husband results in a drastic decrease in the quality of life of the widow and her children. This takes a great toll on the morbidity and mortality of these children.

Table 14: Deaths per 1,000 children ever born to women by marital status and place of residence.

Marital status	Low density	High density	Squatter	Rural
Never married	90.9	25.3	62.5	50.8
Married	50.6	88.0	132.4	129.1
Divorced and separated	153.8	92.9	102.6	148.4
Widowed	-	95.2	151.1	144.7
Total	52.2	87.2	131.2	130.5

Summary and Conclusion

27. To recapitulate, Zambia is characterized by high level of mortality which is to a large extent due to relatively high infant and child mortality. The general mortality level as indicated by the crude death rate is higher in rural than urban areas; 20.7 as against 6.5 per 1,000 population. It may be mentioned that the estimated urban crude death rate is rather on the low side and this may be partly due to gross omission of events. The infant death rates were 120.3 and 36.5 for rural and urban areas respectively. Child mortality is also high in Zambia. 142 children out of 1,000 births will die before their second birthday. The high crude death rate noted above implies an expectation of life at birth which ranges from 41-44 and 45-48 years for males and females respectively. This rather low expectation of life at birth points to the gigantic health problems which health administrators and planners have to grapple with in order to reduce excessive mortality particularly in infancy and early childhood. It is worth mentioning that some developed countries have already attained life expectancy of 70 years or more.

28. The Zambia data corroborate the almost universal finding of higher male than female mortality particularly in infancy and early childhood. Irrespective of sex children born in rural areas experience higher child mortality than their counterparts in the urban areas. Among the three urban residential areas children born to mothers in the squatter areas were the most disadvantaged. In general, children in low density areas have the highest survivorship.

29. It was shown that seasonal pattern of mortality exists in Zambia. A greater proportion of deaths occurred during the wet season, December to March. For infants the wet and cold seasons took a heavy toll while for older ages the dry season accounted for greater proportions of deaths. It was also noted that greater proportion of deaths among children aged 1-4 occurred during the wet season.

30. The structure of causes of death in Zambia is not different from what obtains in most developing countries. Infectious and parasitic diseases as well as malnutrition still influence the mortality scene in infancy and early childhood. This pattern of causes of death underscores the need for a shift of emphasis from curative to preventive medicine by health administrators and planners. Innoculation and vaccination against childhood diseases such as measles, whooping cough, tetanus and other diseases as well as prophylatic programmes against malaria and worms will undoubtedly yield dividends in the short-term and long run. Nutritional and sanitation education programmes among women will also contribute to combating factors sustaining high mortality.

31. It was noted that there was rural-urban mortality differential in Zambia. Residence in a rural area per se is not conducive to high mortality. It is the lack of health facilities and social amenities such as good housing, good drinking water and adequate sewage disposal system which predispose people in the rural area to relatively high mortality. The availability of many health establishments in Lusaka in addition to the University Teaching Hospital (UTH) complex make it potentially easier for urban dwellers to get quick and reliable medical care. How much care urban dwellers actually get is dependant on the availability of easy transportation and the educational and economic background of each individual family.

32. There are mortality differentials according to level of education and marital status of women. It was shown that increasing educational attainment is associated with consistent and significant fall in mortality. While 58.2 per cent of dead children in Keembe had mothers who had never been to school, the percentage was 0.7 for children whose mothers had secondary and higher education. The pattern was the same for Lusaka; 43.4 and 5.0 per cent were children of mothers with no formal education and those with secondary and higher education respectively. The high infant and child mortality among non-educated women raises the question about the accessibility of this social group to public health facilities and medicines. Children born to never married women have higher survivorship than their counterparts born to widows, married, divorced and separated women. Children born to married women also experienced lower mortality than children of widows, divorced and separated women. However, single women have fewer children on average.

33. It should be noted that education is not the only factor related to mortality; nutrition, housing, other economic characteristics of the family, cultural practices related food taboo and perceptions of cause of death and sanitation including quality of water have an impact on mortality. However, education is related to level of income, type of occupation, housing, and other factors which in turn, are related to mortality. The fact that a woman has attended school will not automatically reduce the mortality

of her children. Nevertheless, it is more likely that those women who have achieved some education also possess several characteristics which would help in reducing infant and early childhood mortality. It is worth mentioning that education by itself would provide mothers with the ability to practice some preventive medicine and to recognize important symptoms and lead them to seek prompt medical care for their children.

34. It seems that the possibility of modifying other factors affecting mortality - living standards (particularly nutrition) and public health facilities in the short run is not as great as the possibility of increasing the level of health education by informing women about particular serious diseases, symptoms and hygienic practices through country wide training programmes.

STATISTICAL TABLES

1. The follow-up population by sex and age for rural and urban samples:

Age	URBAN		RURAL	
	Male	Female	Male	Female
0-4	1,438	1,354	314	340
5-9	1,216	1,287	334	299
10-14	918	920	270	281
15-19	595	757	187	163
20-24	436	667	95	103
25-29	399	433	60	91
30-34	383	400	55	102
35-39	376	295	53	91
40-44	307	172	47	81
45-49	227	107	57	102
50-54	150	36	68	42
55-59	77	13	45	16
60+	49	22	81	46
Total	6,571	6,513	1,666	1,757

2. Retrospective data on number of children ever born and children dead by age of women.

Age	URBAN			RURAL		
	Women	Children Ever-born	Children Dead	Women	Children Ever-born	Children Dead
15-19	757	279	27	163	59	3
20-24	667	1,276	110	103	194	24
25-29	483	1,961	165	91	379	52
30-34	400	2,348	222	102	598	71
35-39	295	2,194	237	91	615	63
40-44	172	1,415	180	81	611	75
45-49	107	1,018	-	102	791	136
Total	2,881	10,491	1,112	733	3,247	424

3. Prospective number of deaths reported during the survey.

Round	U R B A N					R U R A L				
	Under 1 year	1-4	5-9	10-14	15+	Under 1 year	1-4	5-9	10-14	15+
Second	2	10	1	2	3	3	1	1	1	14
Third	10	8	1	1	10	3	7	1	1	8
Fourth	4	3	-	-	6	6	4	1	1	3
Total	16	21	2	3	19	12	12	3	3	25

4. Retrospective number of deaths 12 months proceeding the survey.

Locality	Under 1 year	1-4	5+	NS	Total
Low	-	-	3	2	5
High	3	3	15	1	22
Shanty	3	7	11	8	29
Rural	3	6	12	3	24
Total	9	16	41	14	80

5. Number of women by maternal education, number of children ever-born and children dead.

Level of education	LOCALITY											
	LOW			HIGH			SHANTY			RURAL		
	Women	Children Ever-born	Dead	Women	Children Ever-born	Dead	Women	Children Ever-born	Dead	Women	Children Ever-born	Dead
No education	14	80	7	128	386	112	401	2,469	362	306	1,672	249
Grade 1-4	18	130	8	180	1,187	117	338	1,809	241	156	1,014	142
Grade 5-7	79	481	25	235	1,048	69	343	1,081	111	98	352	34
Form 1-2	63	299	10	75	261	11	40	108	6	4	21	2
Form 3-5	64	214	12	75	167	5	24	43	2	1	2	1
Primary and Trade	-	-	-	3	19	2	1	1	-	-	-	-
Teacher Training	4	18	1	2	7	-	-	-	-	-	-	-
Post Secondary	26	103	4	22	70	4	-	-	-	-	-	-
University	9	22	-	-	-	-	-	-	-	-	-	-
Total	277	1,347	67	720	3,645	320	1,147	5,511	722	565	3,261	428

6. Marital status of women by number of children ever-born and dead

Marital status	LOCALITY											
	LOW			HIGH			SHANTY			RURAL		
	Women	Children Ever-born	Dead	Women	Children Ever-born	Dead	Women	Children Ever born	Dead	Women	Children Ever-born	Dead
Never married	20	33	3	51	79	2	26	48	3	28	59	3
Married	252	1,285	65	588	3,194	281	1,060	5,120	678	441	2,695	348
Separated	2	4	-	8	45	3	11	43	5	6	28	2
Divorced	2	9	2	47	181	18	29	152	15	61	309	48
Widowed	1	11	-	25	147	14	19	139	21	26	159	23
Total	277	1,342	70	719	3,646	318	1,145	5,502	722	562	3,250	424