Republic of Sierra Leone

2004 Population and Housing Census

Analytical Report on the Mortality and Disability Status of the Population

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EXECUTIVE SUMMARY

The 2004 Population and Housing Census was conducted from the 4th – 19th December 2004. The census was conducted in 819,854 households from which a total population of 4,930,552 people were registered with an average household size of 6.0. The Male: Female sex ratio was 94.2

This monograph reports on the mortality and disability indicators. Data were collected in the 2004 Population and Housing Census to estimate crude mortality rate, age specific mortality rates, infant mortality rate (IMR), child mortality rate (CMR) and under-five mortality rate (UFMR). Also Disability statistics were collected and analysed by differentials of sex, female education, type and cause of disability and by economic status. Adult mortality estimates are also provided.

Sierra Leone has exhibited high levels of infant and childhood mortality over the years. The questions on children ever born and children surviving to the date of the 2004 Population and Housing Census resulted in responses out of which infant and childhood mortality levels were calculated. The results showed that the levels were high but what is more revealing is that child mortality is higher than infant mortality at national, regional and district levels.

Nationally, the overall adult mortality levels are low. At regional level, they are lowest in the Southern and Western regions, and highest in the Eastern region. The Northern region that had relatively lower infant and childhood mortality levels ranks among regions with high adult mortality level.

The results of the 2004 Population and Housing Census indicate clearly that although mortality levels (childhood and adult) are high in the country, childhood mortality levels are higher than adult mortality at the national, regional and district levels.

The Brass Indirect technique for estimating mortality rates was the methodology used to calculate the IMR, CMR, UFMR and the Adult mortality rates.

The Crude death rate defined as the total number of registered deaths per 1,000 population was calculated as 20.1 (Males 21.5 and Females 18.8) for Sierra Leone. Disaggregated by regions the crude mortality rates are as follows: East 24.4 (Males 25.2, Females 23.5); North 15.4(Males 17.3, Females 14.1); South 25.0 (Males 26.6, Females 23.5); and West 17.4 (Males 18.3, Females 16.4). The results show that crude mortality is highest in the Southern Province and lowest in the Northern Province.

The calculated adjusted age specific mortalities indicate higher mortality among males than females. Graph of the mortality patterns shows a **U** shaped graph indicating high early childhood mortality followed by a decline in the 5-14 years age groups and then rises in older age groups. This pattern of mortality is reminiscent of populations where over fifty percent of mortality incidence occurs to children under-five years because of youthful age structure in the population

Infant, Child, Under-five and Adult mortality rates:

The results show improvement of the above indicators over the 1985 Population and Housing Census. In this report, the calculated Infant Mortality rate was 115/1,000 live births; the Child mortality rate was 87/1,000 live births and the Under-five mortality rate was 194/1,000 live births.

Disaggregated by regions, the IMR for Eastern, Northern, Southern and West provinces were 124, 109, 129, and 92/1,000 live births respectively. Similarly, the Child mortality rates disaggregated by provinces were 96, 80, 100, and 64/1,000 live births respectively for Eastern, Northern, Southern and Western provinces. Also the Under-five mortality rates for Eastern, Northern, Southern and Western Provinces were respectively 211, 182, 216, and 151/1,000 live births. For all the indicators, mortality levels were lowest in the Western Province and highest in the Southern Province.

Comparatively, the overall adult mortality levels are lower than the infant, child and under-five mortality levels. The Southern and Western regions have the lowest adult mortality levels, followed by the Northern Province and the Eastern Province.

Life Expectancy at Birth:

The definition of life expectancy at birth is the average number of additional years a person could expect to live if current mortality trends were to continue for the rest of that person's life. In the Census the life Expectancy at birth for Sierra Leone was 48.4 years (Males 47.5 and Females 49.4 years). Disaggregated by regions, the life expectancies were as follows: East 46.6 years (Male 45.1, Females 47.6); North 49.8 years (Males 48.9 and Females 50.7 years); South 45.7 years (males 44.9 years, Females 46.6 years); and Western Area 53.5 years (Males 52.5 years and Females 54.5 years). Life Expectancy in the Western Area was the highest followed by the Northern, the Eastern and then by the Southern province.

Immunisation Status of Children born within 12 months of the census:

Immunisation of children is one of the strategies that improve on the well being of under-five children. The survey collected information on the children who were born within 12 months prior to the census. The immunisation coverage for such children showed that only 36% were fully immunised for their age. Fifty-six percent were partially immunised while 8% were not immunised at all. Immunisation of children varied by the education status of the mother: while 35% of the children immunised were from mothers with no education, 43% of the immunised children were from mothers with a secondary or higher education.

Disability

Disability was defined as a limitation of an individual in performing a daily life's activity in a manner considered normal for a person of his/her age. In the census, prevalence of disability was recorded as 2.4% (males 2.6%, females 2.2%) for the whole country.

Regional variation in disability rates was also observed with the southern province having the highest prevalence (2.9%), followed by the East (2.8%), then by the North (2.2%) and the West (1.7%).

1.0 MORTALITY AND DISABILITY

Introduction

Human population structures in a country are generally determined by the following; mortality, fertility and migration. Mortality is mainly affected by morbidity patterns; however it is more difficult to ascertain type and cause of morbidity without appropriate medical investigations. It is often easier to determine mortality, as it is the final outcome. The quality/standard of life of people are reflected in socio-economic indicators such as Infant and Under-five mortality, maternal mortality rate, disability rates by types and cause. In the absence of appropriate and accurate vital registration of events such as births and deaths, information on the afore-mentioned indicators is often collected in specialized health and demographic surveys and censuses soliciting information and collecting data at household level. Such information is retrospective and rather depends on statistical analysis using indirect methods to arrive at reliable and robust estimates. These estimates are often used as tools for monitoring the health status of the population.

Quality analysis depends on the frequency and timeliness of data collection so that trends in the estimates of indicators are outlined. In the case of Sierra Leone, valid trends in mortality and morbidity figures are difficult to ascertain as the main source of such data, population censuses have been far and few in between. It took nearly twenty years after the 1985 population census before the 2004 population census could be conducted.

One of the simplest ways of collecting information on child mortality is birth history survey, in which dates of birth and death are collected. Child mortality estimates derived from birth history surveys, however, are commonly affected by two types of response errors: omission of events and dating errors. The omission of both the birth and death of dead children may lead to considerable underestimation of infant and child mortality. The absence of dates of birth or death, or lack of information on the age at death of the dead child, is also likely to produce underestimation of mortality, since such cases have to be excluded from the analysis. Furthermore, misreporting of deaths and ages can distort the age patterns of mortality. Other types of errors, such as biases in the selection of respondents may also affect mortality estimates derived from surveys.

The study of adult mortality is more complex than that of child mortality. Adult deaths are relatively rare events. To obtain reliable measures of adult mortality in a survey requires data either on a large sample of people or on events occurring during a long reference period. A second issue that arises is that it is difficult to identify an appropriate informant who can provide reliable information about deceased adults, relating to a well defined risk period. In the past, attempts have been made to collect data on general mortality in household surveys but coverage of deaths has been very poor. Traditionally, census and survey questions on deaths within the household have been put to the head of the household usually with a reference period of the last 12 months.

Among factors that account for the unsatisfactory coverage is dissolution or disappearance of households – by death or migration – prior to the survey, and the

perennial problem of definition and identification of a household, particularly, in African societies (Owusu, 1988).

Duplication and omission of deaths also occur from the difficulty of identifying the household to which the deceased belong. In several W. F. S. surveys the number of deaths reported each month declined as the interval between their occurrence and the survey increased (Timaeus 1987).

In addition to the above errors, there are also omissions, perhaps because of unwillingness on the part of the respondents to talk about the dead. There is more reluctance to discuss deaths in response to general questions: 'how many deaths' etc. by contrast with specific inquiries such as 'is your mother/ father still alive?' etc. Sampling errors and errors in the reporting of ages at birth mean that it is seldom possible to accept the age-specific mortality rates as they stand. Usually, the data have to be smoothed by fitting a model life table. Thus they are of little use for studying patterns of mortality in detail.

In view of the fact that household survey data on deaths in the last year elicit poor responses, and registration data are rather poor, direct measures of child and adult mortality do not seem to be very encouraging in many developing countries. Sierra Leone is no exception. The 2004 integrated household and census data on deaths in the last year before the census elicit poor responses. The growth balance method (Brass 1974) has been used to correct the mortality data, and plots of partial birth and partial death rates computed and illustrated in tables A1.1 to A1.19 and Figures A1.1 to A1.19 of Annex 1, show that there is gross over reporting of deaths in all the regions of the country, even for the country as a whole. This phenomenon is contrary to what is usually observed in most developing countries where under reporting of deaths is a more common occurrence. It may appear that estimates obtained from direct counts of mortality in Sierra Leone may be unreliable and questionable. It is perhaps better to resort to indirect methods of estimation. In view of the paucity of information, it is impracticable to adopt any particular procedure without making assumptions. Moreover, it may often be impossible to check the reliability of information against independent sources.

Indirect methods represent an attempt to overcome the difficulties that arise in direct methods of collecting information about dead individuals and especially about individuals who died a considerable time ago.

1.1 The Crude and Adjusted Age Specific Mortality Rates

The Crude death rate (CDR) defined as the total number of registered deaths per 1,000 population was calculated as 20.1 for Sierra Leone (Males 21.5 and Females 18.8). This compares favourably with crude death rates of 28.0 for 1974 and 25.0 for 1985. Disaggregated by regions the crude mortality rates are as follows: East 24.4 (Males 25.2, Females 23.5); North 15.4(Males 17.3, Females 14.1); South 25.0 (Males 26.6, Females 23.5); and West 17.4 (Males 18.3, Females 16.4). The results show that crude mortality is highest in the Southern Province and lowest in the Northern Province. Age

Specific Death Rates in the population is defined as the probability of dying within a specific age group. Registered reports of deaths at specific ages are often inaccurate in population censuses thus age specific mortality rates are calculated using smoothing techniques to get adjusted (standardised) death rates. In order to calculate the Adjusted age specific death rates, the following smoothing methodology was followed in the algorithm described below:

1. Take logarithm of reported death rates in the age groups (1<, 1-4, 5-9, 10-14 etc)

2. Take average of each consecutive 3 logs of the death rates

3. Take antilog of the averages

4. Multiply the rates derived in (3) above by the corresponding populations to calculate the number of deaths at each age

5. Sum the calculated deaths and compare them to the total registered deaths for ages 20-74

6. Take ratio of registered to calculated deaths as compared in (5) above

7. Adjust rates in (3) by multiplying them by the ratio collected in (6) above

Table 1.1.1 below shows the output of the smoothing methodology resulting in adjusted age specific death rates for the population. Figure 1.1.1 shows comparison of the crude versus adjusted death rates for both sexes. This underlines the need for smoothing data on reported deaths at given population age groups. This methodology was followed for the age specific death rate calculation by sex and for all regions/districts.

Table 1.1.1: Adjusted Age Specific Death Rates in Sierra Leone

Age group	Registered Population	Registered Deaths	Age-specific death Rates	Log of Rates	Av.of 3 consecutive logs	Antilog of Averages	Calculated deaths	Adjusted death rates
<1	156024	16637	0.106631	-0.97212	-1.4914405	0.032252	5032	0.014801
01-04	596783	20362	0.03412	-1.467	-1.92187	0.011971	7144	0.005494
05-09	738076	6806	0.009221	-2.03521	-2.1541532	0.007012	5175	0.003218
10-14	566163	3087	0.005452	-2.2634	-2.1073014	0.007811	4422	0.003584
15-19	536507	3679	0.006857	-2.16385	-2.0282932	0.009369	5027	0.0043
20-24	414117	5278	0.012745	-1.89465	-1.9487363	0.011253	4660	0.005164
25-29	404754	3809	0.009411	-2.02638	-1.96605	0.010813	4377	0.004962
30-34	312031	3707	0.01188	-1.92518	-1.8778617	0.013248	4134	0.006079
35-39	299509	3387	0.011309	-1.94659	-1.824186	0.01499	4490	0.006879
40-44	213169	3689	0.017306	-1.76182	-1.6971782	0.020083	4281	0.009216
45-49	176903	3045	0.017213	-1.76415	-1.6508035	0.022346	3953	0.010255
50-54	128387	3491	0.027191	-1.56557	-1.5139158	0.030626	3932	0.014054
55-59	84815	2022	0.02384	-1.62269	-1.4581902	0.034818	2953	0.015978
60-64	87675	3885	0.044311	-1.35348	-1.3177462	0.048112	4218	0.022079
65-69	61214	2446	0.039958	-1.39839	-1.2620271	0.054698	3348	0.025101
70-74	54421	3423	0.062899	-1.20136	-1.1255265	0.074899	4076	0.034371
75-79	36705	2390	0.065114	-1.18633	-1.0073274	0.098327	3609	0.045123
80-84	27098	2780	0.102591	-0.98889	-0.9178274	0.120829	3274	0.055449
85+	35816	5097	0.142311	-0.84676	-0.8467624	0.142311	5097	0.065307
	4930167	**99020**	**0.020085**			**Total**	**83203**	

Figure 1.1.1:

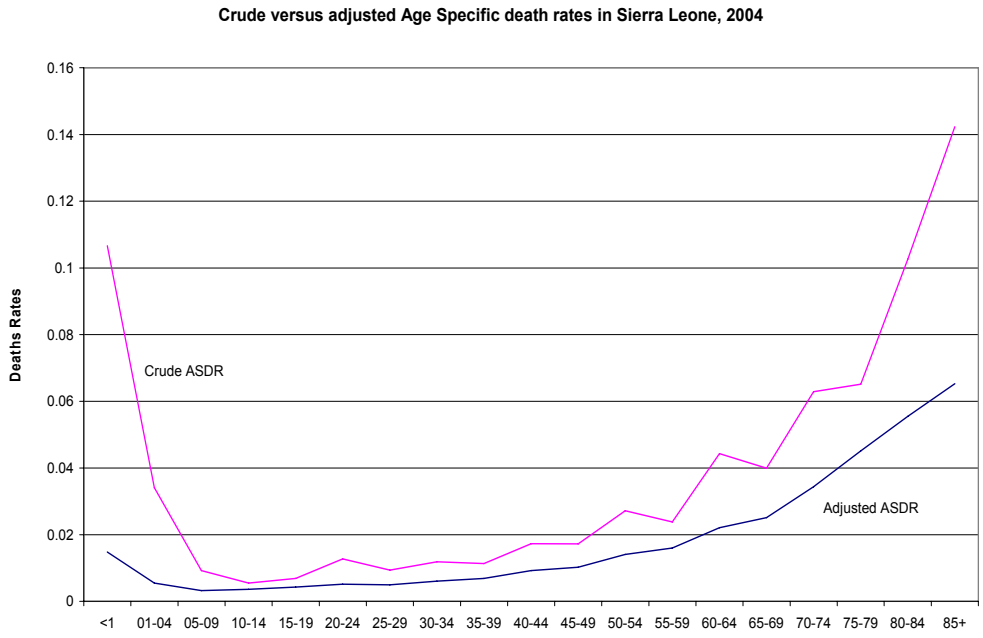


Figure 1.1.2:

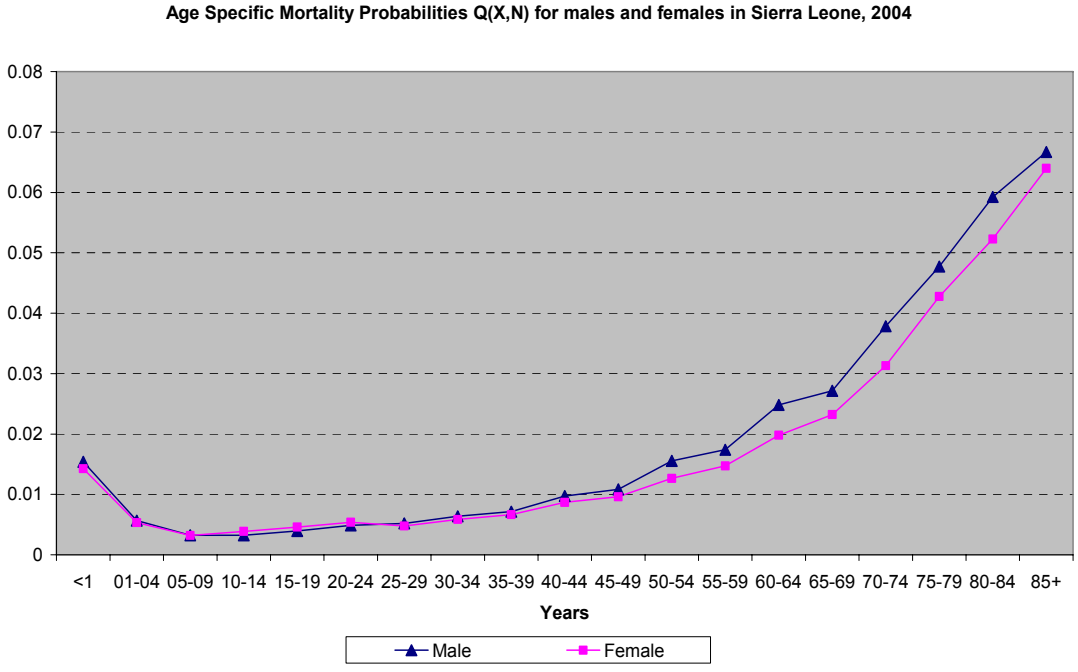


Figure 1.1.2 above shows the mortality patterns between the males and females in the population. In the first ten years of life, male mortality is slightly higher than females. The mortality for females slightly increases in the early reproductive years (10-25) and then falls again below males in the latter years of life.

As in previous censuses the mortality structure of the population shows a **U** shaped graph indicating high early childhood mortality followed by a decline in the 5-14 years age groups and then rises in older age groups. This pattern of mortality is reminiscent of populations where over fifty percent of mortality incidence occurs to children under-five years because of youthful age structure in the population

Age Specific death rates by sex and by region are presented in tables A5.1 to A5. 19 in Annex 5 of this report.

1.2 Trends in Infant, Child and Under-five Mortality Rates in Sierra Leone

In this report, the childhood mortality rates are calculated based on an indirect estimation technique known as the "Brass method". The data used in the estimation are: the mean number of reported children ever born for five year age groups of women from age 15 to 49, and the proportion of these children who were reported dead, also for five year age groups of women interviewed in the census. The technique converts these data into probabilities of dying by taking into account both the mortality risks to which children are exposed and their length of exposure to the risk of dying. When using the Brass method, a model must be selected that best fits the mortality patterns in the country where the survey is conducted. There are four models: North, South, East and West. The North model life table is used in this analysis as the data in Sierra Leone conforms to the situation where the infant and child mortality rates are generally high and previous analyses have also used this model.

Infant mortality rate (IMR) is the probability of a child dying before its first birthday per 1,000 live births. Similarly, child mortality rate (CMR) is the probability of a child dying between the ages of 1 and 5 years per 1,000 live births, whilst under-five mortality (U5MR) rate is the probability of a child dying before its fifth birthday per 1,000 live births.

In general, declining trend in mortality levels over time is an indicator of improvement in the socio-economic characteristics of the population including improvement in health status and improvement in the level of education

Table 1.2.1 Indicates a fall in the mortality rates from 1974 to 2004. Even though there was reduction in mortality rates, the decrease was patently slower between 1985 and 2004 than those between 1974 and 1985. This lull in decrease could be attributable to halt in progress in programmes that produce positive impact on mortality reduction in the country as a result of the decade old war between 1991 and 2002.

The infant mortality rate of 115 per 1000 in the table below seems to be quite close to that of 121 per 1000 given in Table A2.1 (see Annex 2) using Brass' General Standard. The under-five mortality rate of 194 per 1000 obtained from the North model, however, differs from that of 244 per 1000 using Brass' General Standard (Table A2.1 of Annex 2). In view of these disparities, it is perhaps safer to conclude that the infant mortality rate for Sierra Leone lies between 115 and 121 per 1000, and the under-five mortality rate between 194 and 244 per 1000.

Table: 1.2.1: Trends in Infant, Child and Under-five Mortality Rates in Sierra Leone 1974 - 2005

Location	Year	IMR	CMR	U5MR
SIERRA LEONE	1974	0.225	0.182	0.366
SIERRA LEONE	1985	0.194	0.163	0.327
SIERRA LEONE	2004	0.115	0.087	0.194

Source: 2004 National Population Census data, Statistics Sierra Leone

1.3 Regional Variation in IMR, CMR, U5MR in Sierra Leone

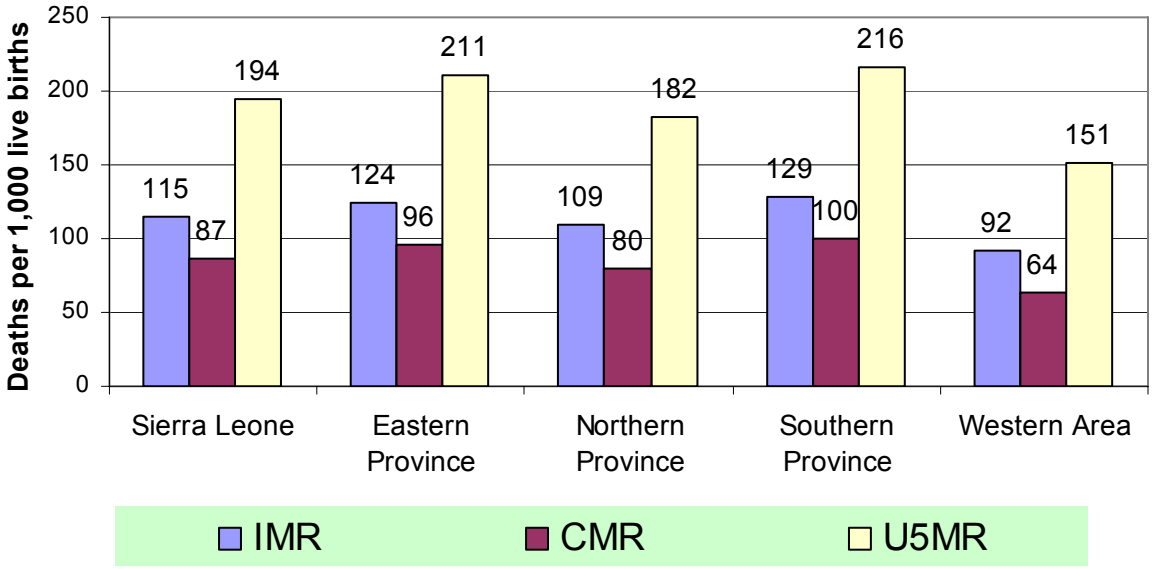
In table 1.3.1 below, comparison of mortality rates between regions show that the Southern Province has the highest infant, child and under-five mortality rates followed by Eastern Province, Northern Province and then by Western Province which recorded the least. Previous studies have shown similar levels of mortality differentials in the regions. Those regions that have consistently had higher prevalence rates of childhood diseases including malaria and diarrhoea have also had higher mortality levels. A particular case in point is the Southern Province whose districts show high mortality rates. The low levels of mortality rates in the Western Area possibly indicate variance in the skewed distribution of and access to complementary social services like health and education. In the Western Area there are more literate people, more people having access to health facilities and more households having access to portable water. Access to these social facilities has possibly contributed to lower levels of childhood mortality and morbidity rates in the province. The table below and the illustration of Figure 1.3.1 show that Western urban district has the lowest mortality rates.

Table: 1.3.1 Regional Variation in Infant, Child and Under-five mortality Rates in Sierra Leone 2004

Location	IMR	CMR	U5MR
SIERRA LEONE	0.115	0.087	0.194
EASTERN PROVINCE	0.124	0.096	0.211
NORTHERN PROVINCE	0.109	0.080	0.182
SOUTHERN PROVINCE	0.129	0.100	0.216
WESTERN AREA	0.092	0.064	0.151

Source: 2004 National Population Census data, Statistics Sierra Leone

Fig 1.3.1.: Infant Child, and Under-five mortality rates by region in Sierra Leone, 2004



Source: 2004 National Population Census data, Statistics Sierra Leone

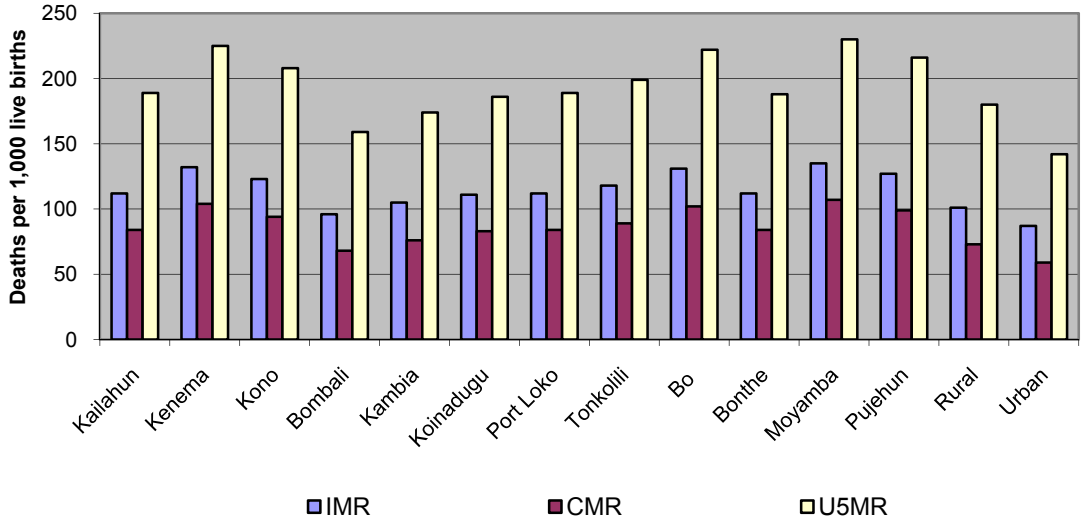
Table 1.3.2: Distribution of IMR, CMR, and U5MR by districts in 2004

LOCATION	IMR	CMR	U5MR
SIERRA LEONE	0.115	0.087	0.194
EAST	0.124	0.096	0.211
Kailahun	0.112	0.084	0.189
Kenema	0.132	0.104	0.225
Kono	0.123	0.094	0.208
NORTH	0.109	0.080	0.182
Bombali	0.096	0.068	0.159
Kambia	0.105	0.076	0.174
Koinadugu	0.111	0.083	0.186
Port Loko	0.112	0.084	0.189
Tonkolili	0.118	0.089	0.199
SOUTH	0.129	0.100	0.216
Bo	0.131	0.102	0.222
Bonthe	0.112	0.084	0.188
Moyamba	0.135	0.107	0.230
Pujehun	0.127	0.099	0.216
WEST	0.092	0.064	0.151
Urban	0.087	0.059	0.142
Rural	0.101	0.073	0.180

Source: 2004 National Population Census data, Statistics Sierra Leone

Disparity in mortality levels exists among districts as shown by table 1.3.2 above and illustrated in Figure 1.3.2 below. Moyamba district has the highest mortality rates followed by Kenema, Bo and Pujehun districts. Disparity in mortality rates between districts provides for policy implications in the provision of health care to the population.

Fig. 1.3.2: Infant, Child and Under-five mortality in by districts in Sierra Leone, 2004



Source: 2004 National Population Census data, Statistics Sierra Leone

1.4 Life expectancy at birth by sex

The average number of additional years a person could expect to live if current mortality trends were to continue for the rest of that person's life is commonly cited as **Life Expectancy at birth**. Running mortality tables using the indirect techniques, the life expectancy at birth for a Sierra Leonean is 48.4 years. Disaggregated by sex, life expectancy for males is 47.5 years, while that for females is 49.4 years. These figures are considerably higher than the life expectancies in 1985 that were recorded as 37 years for men and 40.3 years for women (Table 1.4.1).

Table 1.4.1: Life Expectancy at birth by sex and by districts

Region	Life expectancy at birth		
	Total	Males	Females
SIERRA LEONE	**48.4**	**47.5**	**49.4**
EAST	**46.6**	**45.1**	**47.6**
Kailahun	48.6	49.1	49.5
Kenema	45.0	43.9	46.2
Kono	46.9	45.7	48.2
NORTH	**49.8**	**48.9**	**50.7**
Bombali	52.5	51.6	53.5
Kambia	50.7	50.0	51.5
Koinadugu	49.3	48.2	50.6
Port Loko	49.0	48.1	50.0
Tonkolili	47.9	47.3	48.6
SOUTH	**45.7**	**44.9**	**46.6**
Bo	45.3	44.6	46.1
Bonthe	49.1	48.6	49.6
Moyamba	44.5	43.1	46.0
Pujehun	46.0	45.4	46.7
WESTERN AREA	**53.5**	**52.5**	**54.5**
Rural	50.1	48.9	51.4
Urban	54.8	53.9	N/A

Source: 2004 Population and Housing Census, Statistics Sierra Leone

The distribution of the average number of children surviving to a woman as well as the proportion of children dead to a woman has also been computed for all the administrative areas of the country and the estimates are shown in Tables 1.4.2 and 1.4.3 respectively below.

As indicated by Table 1.4.2 below, the average number of children surviving to women in the country, the regions and districts exhibit similar patterns. The number of children surviving rises with the rise in the reproductive age of a woman and by the end of her reproductive age, with the prevailing mortality conditions in the country, the woman would have an average of 4 surviving children.

Table1.4.2: Distribution of Average Number of Children (both sexes) surviving to a woman (15-49 years) by administrative area, 2004

Administrative Districts	Age Group of Mothers						
	15 – 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49
SIERRA LEONE	0.602	1.319	2.129	3.121	3.805	4.062	4.230
East	**0.653**	**1.398**	**2.186**	**3.126**	**3.786**	**4.058**	**4.213**
Kailahun	0.648	1.392	2.123	3.089	3.777	4.080	4.340
Kenema	0.674	1.398	2.182	3.096	3.734	4.003	4.051
Kono	0.628	1.406	2.256	3.215	3.878	4.119	4.298
North	**0.687**	**1.457**	**2.283**	**3.343**	**4.018**	**4.220**	**4.367**
Bombali	0.621	1.411	2.274	3.327	4.006	4.221	4.334
Kambia	0.744	1.605	2.397	3.555	4.237	4.464	4.497
Koinadugu	0.621	1.347	2.180	3.156	3.782	3.946	4.198
Port Loko	0.693	1.455	2.268	3.325	4.001	4.241	4.366
Tonkolili	0.761	1.483	2.308	3.374	4.065	4.242	4.447
South	**0.699**	**1.483**	**2.260**	**3.282**	**3.942**	**4.130**	**4.278**
Bo	0.615	1.374	2.170	3.176	3.809	4.033	4.218
Bonthe	0.777	1.528	2.340	3.399	4.128	4.367	4.384
Moyamba	0.760	1.584	2.376	3.410	4.029	4.220	4.292
Pujehun	0.775	1.582	2.269	3.270	3.966	4.040	4.307
Western Area	**0.323**	**0.920**	**1.669**	**2.518**	**3.197**	**3.650**	**3.878**
Western Rural	0.552	1.250	2.053	2.898	3.603	3.915	3.992
Western Urban	0.280	0.855	1.586	2.432	3.099	3.589	3.850

Source: 2004 Population and Housing Census, Statistics Sierra Leone

The proportion of children dead to women, like the number surviving, increases with the age of the women. At the beginning of their reproductive ages, Table 1.4.3 indicates that women aged 15-19 years in the country would lose 116 out of every 1000 live births. At the end of their reproductive ages, the proportion of children dead would be 295 to every 1000 live births.

The Western province and its districts (Western Rural and Western Urban) exhibit the lowest proportions of children dead through the reproductive ages. This is followed by the Northern and Eastern Provinces. The Southern Province continues to exhibit higher mortality levels and has the highest proportion of children dead through the women's reproductive ages.

Table 1.4.3: Distribution of Proportion of children (both sexes) dead to a woman (15-49 years) by administrative area, 2004

Administrative Districts	Age Group of Mothers						
	15 – 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49
SIERRA LEONE	**0.116**	**0.189**	**0.201**	**0.240**	**0.257**	**0.275**	**0.295**
East	**0.124**	**0.207**	**0.220**	**0.265**	**0.282**	**0.301**	**0.317**
Kailahun	0.110	0.187	0.209	0.258	0.267	0.279	0.289
Kenema	0.139	0.224	0.233	0.279	0.300	0.321	0.339
Kono	0.115	0.200	0.211	0.250	0.271	0.296	0.318
North	**0.103**	**0.181**	**0.197**	**0.234**	**0.251**	**0.271**	**0.296**
Bombali	0.086	0.155	0.168	0.201	0.210	0.237	0.262
Kambia	0.100	0.174	0.194	0.238	0.253	0.280	0.308
Koinadugu	0.111	0.183	0.194	0.239	0.257	0.280	0.305
Port Loko	0.109	0.188	0.198	0.237	0.259	0.272	0.298
Tonkolili	0.110	0.202	0.227	0.257	0.277	0.295	0.319
South	**0.139**	**0.218**	**0.225**	**0.272**	**0.285**	**0.308**	**0.322**
Bo	0.141	0.215	0.224	0.262	0.273	0.292	0.302
Bonthe	0.130	0.194	0.213	0.257	0.273	0.304	0.316
Moyamba	0.125	0.228	0.235	0.276	0.297	0.321	0.344
Pujehun	0.152	0.223	0.223	0.292	0.297	0.325	0.331
Western Area	**0.087**	**0.136**	**0.143**	**0.157**	**0.176**	**0.191**	**0.210**
Western Rural	0.107	0.173	0.193	0.204	0.228	0.248	0.273
Western Urban	0.079	0.125	0.128	0.143	0.159	0.175	0.192

Source: 2004 Population and Housing Census, Statistics Sierra Leone

2.0 INDIRECT MEASURES OF CHILD AND ADULT MORTALITY

These methods are based on data that can be collected in single-round surveys or censuses about the current characteristics of respondents and, in particular, their age. The defining characteristic of the methods considered is that the unit of analysis is a relative of the deceased and not the person who has died. It is the details of the informant that are used in the analysis rather than those of the dead individual.

Frequently, at present, the most reliable reports on mortality are obtained by asking indirectly about vital events – questions on the survival of parents (orphanhood), on first spouse (widowhood) or on the number of children ever born and surviving at the time of the survey. On the basis of this information and supplementary data, it is possible to work back to measures of the level of child and adult mortality that produced the proportions surviving observed among the respondent's relatives.

Indirect techniques to estimate infant and child mortality were developed following the pioneering work of Brass (1968). These techniques allow the conversion of a survivorship statistic – the proportion of children who have died – into the probability of dying before certain ages.

In general, the survivorship statistic is inflated (deflated) by a multiplier that, in turn, is estimated from known values of statistics that describe the fertility pattern. One of the assumptions on which the method is based is that fertility and mortality have remained unchanged during the past. New techniques have, however, been developed which can be applied to situations in many developing countries where fertility/mortality may not be constant (Palloni 1980, Kamara 1988, 1989, 2002, etc). These techniques allow the estimation of the multipliers independent of any knowledge of or assumptions about the fertility pattern. Instead, the conversion of the survivorship statistic into probabilities of dying depends on parameters describing the age structure of surviving children.

Brass developed a procedure for estimating the time distribution of children born from mean number of children to women in successive age groups based on his fertility polynomial (Brass 1968, 1975). He further developed a set of multipliers which depend on the values C_i (t), t = 1,2…{i.e. the time distribution of children born to women in the i-th age group}. The values C_i (t) are determined by the parameter, S, {where S is related to the total fertility and to the mean age at childbearing}.

Since the parameter, S, is estimated from the mean parity ratio for women in the successive age groups (15-19, 20-24, 25-29…45-49), the multiplier is a function of the mean parity ratio. When the proportions of children dead are adjusted by these multiplying factors, the results correspond to estimates of q (α), that is, the probability that a child will die by age α. Sullivan (1972, 1974) investigated this functional relationship by calculating exact vales of both the multiplier and the mean parity ratio for all possible combinations of numerous observed fertility schedules and model life tables, generating a total of several thousand values for both quantities.
He then regressed the multiplier vales on the parity ratios for various sub-sets of these observations. He also developed similar regression results for the use with proportions of deceased children among all children born to women classified by duration of

marriage. The resulting regression constants provide an alternative means of obtaining multipliers which convert proportions of deceased children to women in a given age group to life table q(x) values. Trussell (1975) subsequently refined this procedure by including further independent variables in the regression and substituting model fertility schedules derived from the Coale – Trussell model (1974) for Sullivan's observed fertility schedules.

The inclusion of additional variables reduces the standard error of the regressions and the use of the Coale – Trussell model tables introduces a wider range of variation into the fertility patterns on which the regression equations are based.

There have been several attempts to weaken the assumption that mortality has been constant during the years before the census, and Sullivan's work (1974) indicated several ways in which child survivorship estimate may be validly interpreted when mortality is changing. In each case, the approximate rate of mortality decline must be specified; hence the trend of mortality is assumed rather that estimated from the data.

Preston and Palloni (1977) suggested an alternative approach to estimation from child survivorship data in which they use the age distribution of surviving children instead of the time distribution of children born. The approach involves reverse-surviving the surviving children instead of forward-surviving the children born.

A procedure was developed by Feeney (1980) for estimating infant mortality rates from figures derived from answers to population census questions on the total number of children a woman has born during her lifetime and on the number of these children who are living at the time of the census.

The statistics required are the number of women in a series of quiniary age groups, beginning with ages 15-19, the total numbers of children born to women in these age groups, and the numbers of these children born who have survived to the time of the census. Application of the procedure yields estimates of the infant mortality rate at a series of time points preceding the census. Both the value of the rate and the number of years preceding the census are derived from the statistics. The ideas underlying Feeney's procedure are a natural extension of the concepts introduced by Brass (1968, 1975) and subsequently developed by Brass, Coale, Sullivan, Trussell and others. Brass (1981, 1985) developed a new technique for estimating the time location, T, for childhood mortality estimates obtained from reports of an age group of mothers.

There are two ways of approaching the estimation of T from observation. Brass constructed a table from which the estimate could be derived for each age group of mother from knowledge of (a-m), where 'a ' is the mid-point of each age group of mothers, and 'm' is the mean of the age specific fertility distribution.

Despite the fact that there could be errors of omission of dead children and misreporting of deaths, child mortality estimates obtained by indirect methods are in general fairly reliable. The problem remaining is adult mortality. This is a much more difficult problem; there is no method that will give completely satisfactory results.

Nevertheless, the orphanhood method seems to be the most reliable method of estimating adult mortality nowadays. Information on orphanhood can be collected using two simple questions that can be included on the interview schedules used in censuses and household surveys. They are 'Is your mother alive? 'and 'Is your father alive ? '. The idea of obtaining indirect estimates of adult mortality from the proportions of people with parents who have died originated from Henry (1960). Henry's idea was taken up by Brass, who developed a variety of approaches for calculating conventional life table indices from proportions of respondents with living parents, before publishing a straightforward method, expressing the life table measures as weighted averages of two adjoining proportions that could be applied to both maternal and paternal orphanhood data (Brass and Hill, 1973). Brass's method takes the mean age of parents at the birth of their children as an index of the age at which exposure to the risk of death starts.

This is used to select appropriate weights for the conversion of the orphanhood data into indices of survival between convenient specified ages. Thus the measures calculated for women are probabilities of surviving from age 25 to 25 plus the current age of the respondents {l(25+N)/l(25)}. Where N is the central age of the adjoining age group being averaged.

A variety of regression-based procedures for estimating adult female mortality have since been developed, using the Princeton and the New UN model life table systems (e.g. UN 1983; Palloni and Helligman 1986). These procedures use the same index of the timing of fertility (i.e. mean age of childbearing) as the original method and produce equivalent measures of conditional survivorship in adulthood. The difficulties involved in modeling male fertility mean that, to date, the original method proposed by Brass and Hill (1973) remains the only way of analyzing paternal orphanhood data. Hill and Trussell (1977) suggested an alternative regression-based method of estimation that produces measures of survivorship from birth to a range of adult ages by incorporating an estimate, derived from other questions, of the probability of surviving to age two, among the independent variables. This method was incorporated in the UN (1983) manual on indirect methods and is still often applied.

Feeney and others have shown in the case of child mortality, that if the trend is linear (on an appropriate scale) the equivalent time point, T, is independent of the steepness of change. T values, which are robust to variations in the unknown factors, can be determined. This principle was taken further by Brass and Bamgboye (1981).

Brass and Bamgboye (1981) developed a method for estimating the time location, T, for adults. They determined for each measure of retrospective, cohort type survivorship the equivalent time point such that the survivorship with the period life table of that time and corresponding exposure to risk would be the same. Of course some assumptions are necessary about the pattern of mortality and the nature of change.

One advantage of the orphanhood method over direct methods of estimating mortality is that the information used is based on the respondent's lifetime experience. Thus fairly precise estimates of the proportions of respondents with living parents can be obtained from surveys of as few as 5000 individuals (Graham and Timaeus 1988). Equally, because the questions involved are simple and can be included on census forms, it is

operationally feasible to collect orphanhood data on a very large scale and to use it for detailed studies of mortality in comparatively small districts of a country.

Opinions on the reliability of the orphanhood method as a way of estimating adult mortality have varied over time. To date, no clear consensus has emerged among demographers as to the validity of the orphanhood method and its applications have met with mixed success. Recent reviews have taken advantage of the development of techniques for locating the time to which the mortality indices refer and on the increasing availability of several sources of information on adult mortality for the same country. These reviews have been more optimistic (Blacker and Mukiza-gapare, 1988, Timaeus, 1986).

In many developing countries successive sets of orphanhood data have indicated consistent levels and trends in adult mortality and agree well with other sources (Moser 1983; Timaeus 1986). In contrast, other countries, such as Kenya and Malawi, offer evidence of errors in the data or method of estimation. In particular the mortality estimates obtained from the reports of young respondents seem too low, exaggerating the apparent decline in the level of mortality. Two factors probably explain these errors. The first is generally termed the adoption effect. Respondents whose parents have died are likely to be reared by another adult and may not even know that this person is not their biological parent. If this foster parent is mistakenly reported on, mortality will be underestimated.

The problem is most severe for young children, whose adopted parent may answer the question on their behalf, or who may be assumed by the interviewer to be the real parent (Palloni 1984; Timaeus 1987).

The adoption effect could underlie the consistent tendency for African orphanhood data to show steep declines. There could be other reasons (other than the adoption effect) for the recent steep declines in adult mortality in developing countries, particularly, Africa. A method for equating the number of living children reported by mothers under a certain age, say ‘w’, with the mothers of children under an equivalent age, say ‘z’, who are alive, has been derived by Brass (1985).

The method has been applied to the 1979 census data of Kenya; and the accuracy of the data on maternal orphanhood has been assessed. Brass deduced from the analysis that the reporting of the number of mothers surviving and, hence, of the residual, the numbers dead, was good.

Although the precision of the check is not sufficient for a refined assessment of the measures at late ages of women or of the ‘adoption’ effect (errors because of foster care when a mother dies at or shortly after a birth) it is high for the middle age group of respondents, where the reports are critical for the estimation of adult female mortality. In his view, the reporting of maternal orphanhood in Kenya was broadly accurate.

Can one then conjecture (in the presence of the latter evidence) that the pattern of adult mortality has not remained fixed in some developing countries, particularly, Africa? If this is so, it is not surprising that problems are encountered in the use of the

orphanhood data; especially when a variety of mortality models have to be used to produce life table measures of mortality. In this case, the choice of wrong models may incorporate an inappropriate age pattern of mortality (Blacker and Mukiza-Gapere, 1988; Kamara, 1988). This seems to be a particular problem in Africa. New techniques have been developed on how to make more accurate inferences about the age patterns of mortality (Brass 1975; Kamara 1988).

Recent developments in demography now allow the use of a greater variety of models and model relationships. Several model life table systems (old as well as new ones) have been developed to date. These include: (1) the empirical model life tables {e.g. The old and new U.N. model life tables; 1956, 1982; the Princeton series prepared by Coale and Demeny (1966)} and (ii) the relational model life tables {e.g. Brass's two parameter logit system (1968) with general and African standards, the Zaba four parameter logit system (1979), and the Ewbank et al. four parameter adaptive system (1983)}. The above models have been used extensively on demographic data; their advantages and disadvantages have also been observed.

In this chapter estimates of mortality will be done both by direct and indirect estimation methods. Direct estimates of crude and standardised age specific death rates are presented by differentials of sex and locality. Indirect methods of infant and child mortality are presented using Brass methods and Adult mortality by Orphanhood method. Maternal mortality estimates will not be provided as the questions, which could ensure calculation of maternal mortality using indirect techniques like the sisterhood method, were not asked. Where ever possible data will be disaggregated by sex, and by region/district.

3.0 ESTIMATES OF MORTALITY FOR SIERRA LEONE (AN INDIRECT APPROACH)

3.1 Introduction:

The estimates are of mortality over different age ranges at different points in time. A series of the same type, for example child mortality cannot be used to specify trends unless each estimate can be translated into a measure, which is equivalent for all. To do this requires a fixing of the age pattern for any level of mortality, in other words, the choice of one parameter set of model life tables.

Each mortality level has a related time location. Although different procedures lead to variations in the estimates of time location T, these are of minor significance compared with the effects of the choice of the set of model life tables on the equivalent measures and hence the derived trends. Obviously a sharp increase in the proportions of children dead as the age of mother rises can be due to falling mortality, relatively high death rates in later childhood as compared with the earlier years or some combination of both.

The Brass logit system of model life tables provides a convenient tool for the more specific investigation of these issues. The system is generated by the logit equation: $Y(x)=\alpha+\beta\gamma_s(x)$, where $\gamma(x) = 0.5 \text{ Ln } \{1-l(x)/l(x)\}$ and the s defines a standard pattern of survivorship values $l_s(x)$. The 'Brass General Standard' $l_s(x)$ constructed to represent an average pattern over all populations, has been the base for many of the time location applications. The factor α (alpha) governs the level of mortality; whilst the factor β (beta) governs the relationship between mortality in youth and adult life.

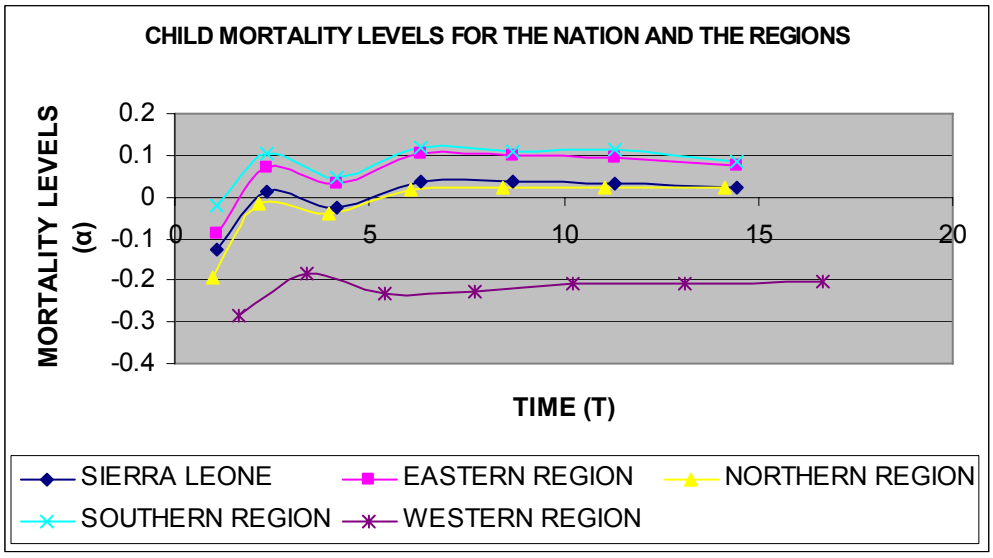
For the purpose of showing trends in child and adult mortality, β is taken to be equal to 1 (β = 1.0), reducing the system to a one-parameter set of model life tables. Each estimate of survivorship from the retrospective reports for children or adults then gives a corresponding α (alpha) at a location in past time. Trends in the α in childhood and in adulthood, if reasonably regular, can be interpreted as changing mortality for the corresponding stage of life.

3.2 Infant and child mortality levels

Sierra Leone has exhibited high levels of infant and childhood mortality over the years. The questions on children ever born and children surviving to the date of the 2004 Population and Housing Census resulted in responses out of which infant and childhood mortality levels were calculated. The results showed that the levels were high but what is more revealing is that child mortality is higher than infant mortality at national, regional and district levels. Mortality levels then stabilise for the other ages as Figure 3.2.1 below shows. Tables showing infant and child mortality level are in Annex 2 of the report.

At regional level, infant and childhood mortality levels are highest in the Southern region followed by the Eastern region. The levels in the Northern region show an improvement even over the national level. The Western region has the lowest level.

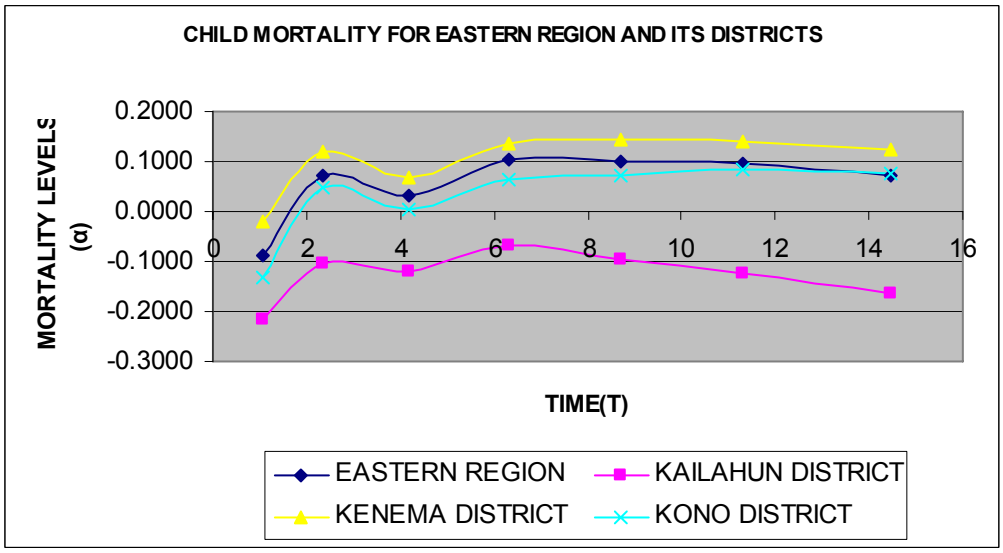
Fig 3.2.1 Infant and childhood mortality levels in Sierra Leone and regions



Source: 2004 Population and Housing Census, Statistics Sierra Leone

The Eastern Region is shown to have high levels of infant and childhood mortality and this is also true of the districts in the region. The levels in Kenema district are even higher than the regional level. The levels in Kailahun are the lowest in the region, followed by Kono district, as Figure 3.2.2 below shows.

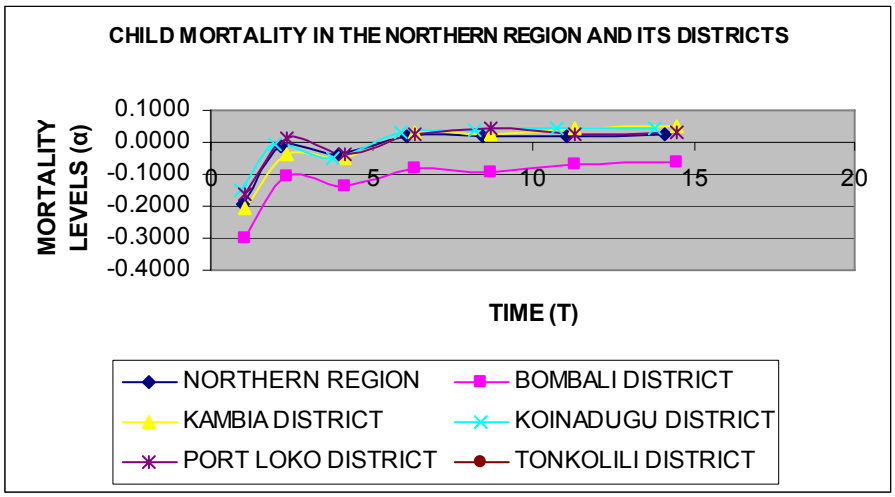
Fig 3.2.2 Infant and child mortality in Eastern region and districts



Source: 2004 Population and Housing Census, Statistics Sierra Leone

Infant and child mortality levels have shown great improvements over the years and the results of the census indicate that apart from the Western region, the north has the lowest level. As Figure 3.2.3 below shows, Kambia, Koinadugu, Port Loko and Tonkolili districts all hover around the regional level, meaning that the levels are similar. Bombali district has the lowest infant and child mortality level in the region and for all of them, infant mortality is lower than child mortality.

Fig 3.2.3 Infant and child mortality in Northern region and districts

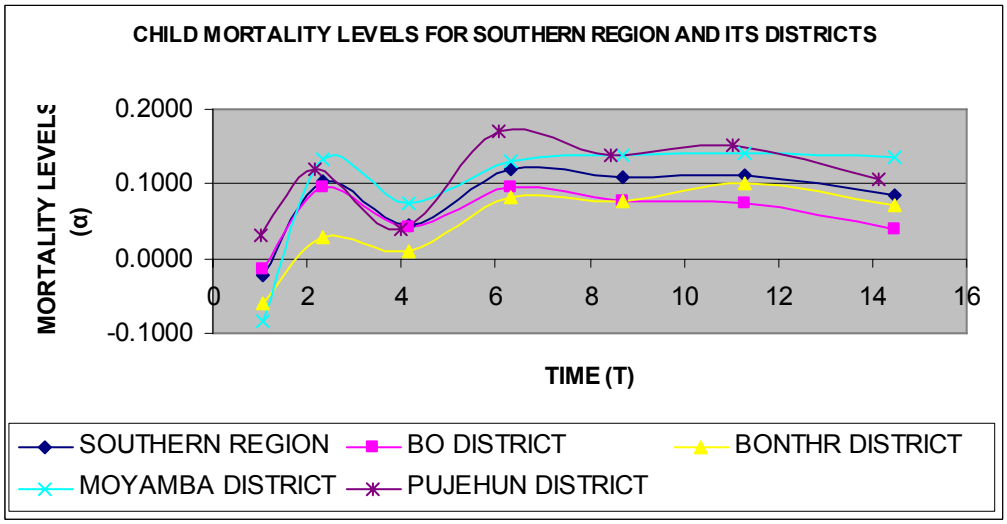


Source: 2004 Population and Housing Census, Statistics Sierra Leone

The results of the census have shown that the Southern region has the highest infant and child mortality levels in the country. Probable reason for this is that infant and child mortality may have been under-reported in the other regions during the census.

As Figure 3.2.4 below indicates, Pujehun and Moyamba districts have the highest infant and child mortality levels in the region. Bo and Bonthe districts have lower levels.

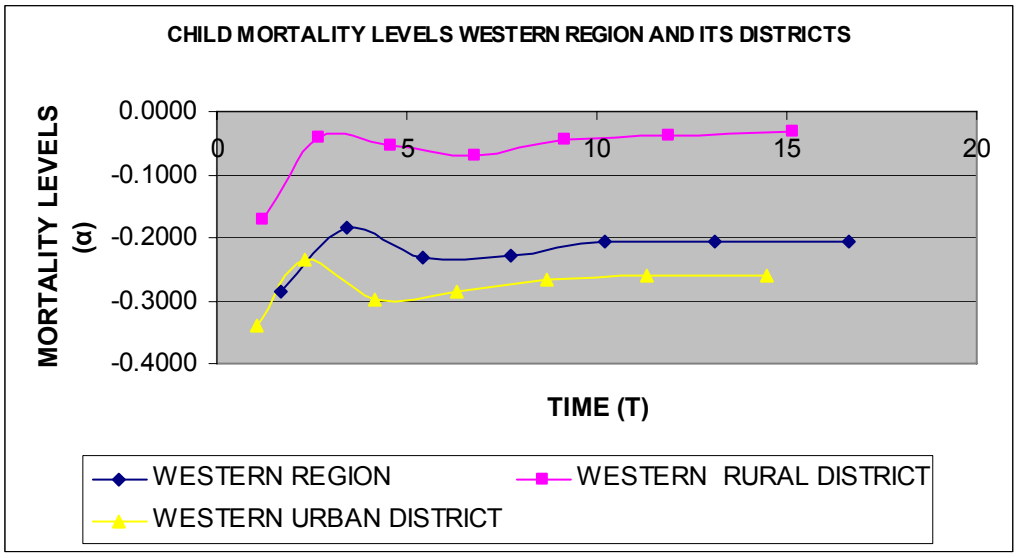
Fig 3.2.4 Infant and child mortality in Southern region and districts



Source: 2004 Population and Housing Census, Statistics Sierra Leone

With the much-improved medical facilities in the Western region, where the capital city is situated, infant and child mortality are shown to be reasonably low and are the lowest in the country. Although the Western rural district has the highest level in the region, it is lower than the levels exhibited in the other regions and districts. This is shown in Figure 3.2.5 below.

Fig 3.2.5 Infant and child mortality in Western region and districts



Source: 2004 Population and Housing Census, Statistics Sierra Leone

3.3 Adult mortality levels

Little is known about adult mortality in this country than about infant and child mortality. A question on 'Orphanhood' was included in the 1985 census but collected information only on maternal orphanhood. Unfortunately, this data is not available and therefore comparative analysis of the 1985 census data on adult mortality with the 2004 census data cannot be done in this report. An improvement over the 1985 census was the inclusion of a question on 'paternal orphanhood' in the 2004 Population and Housing Census questionnaire.

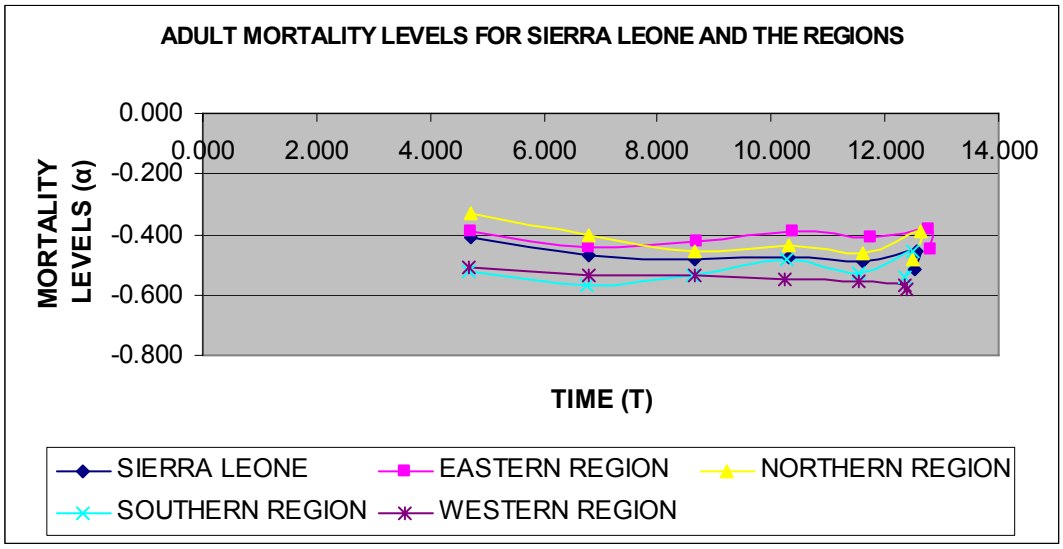
The following questions were asked on orphanhood:

- Is……mother alive?
- Is…….father alive?

Simple answers of 'YES' or 'NO' were expected from the respondents. The results obtained indicate a low level of adult mortality compared with mortality in infancy and childhood in the country as a whole. Tables on levels of adult mortality are in Annex 3 of the report.

Nationally, the overall adult mortality levels are low. At regional level, they are lowest in the Southern and Western regions, and highest in the Eastern region. The Northern region that had relatively lower infant and childhood mortality levels ranks among regions with high adult mortality levels. This is shown in Figure 3.3.1 below.

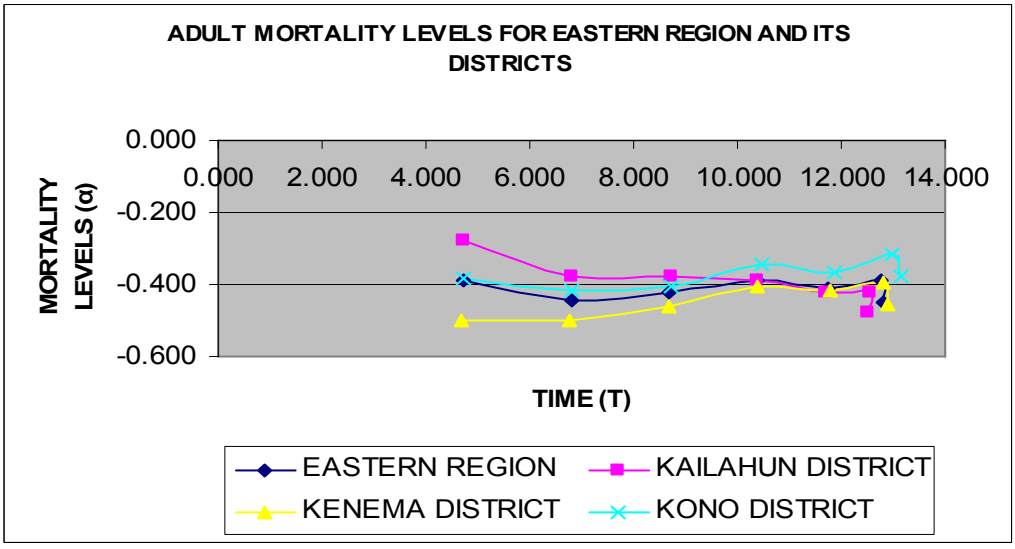
Fig 3.3.1 Adult mortality levels for Sierra Leone and the regions



Source: 2004 Population and Housing Census, Statistics Sierra Leone

Adult mortality levels are also relatively low in the districts. In the Eastern region, Kenema district has the lowest adult mortality level followed by Kono district. Kailahun district is consistent in having the highest mortality levels in the region as is shown in Figure 3.3.2 below.

Fig 3.3.2 Adult mortality levels for Eastern region and districts

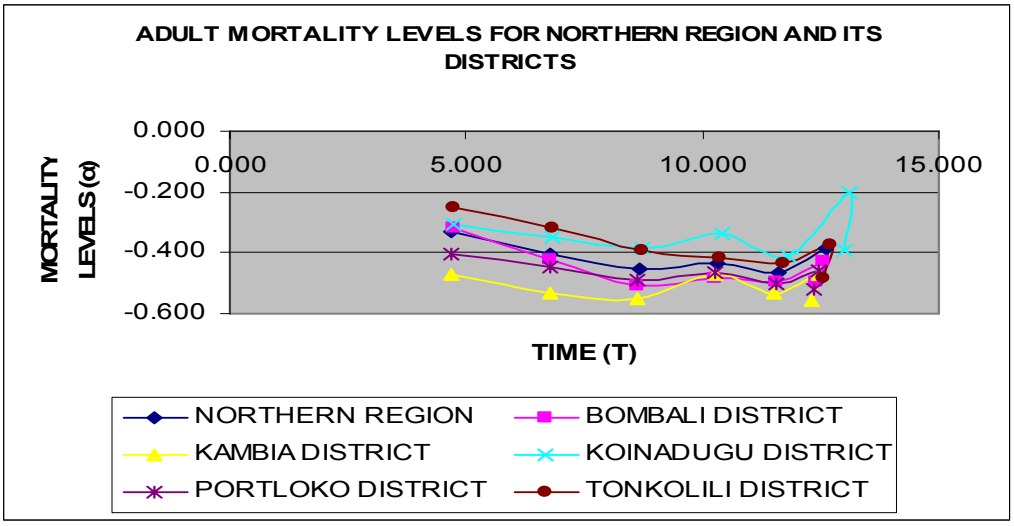


Source: 2004 Population and Housing Census, Statistics Sierra Leone

Although the adult mortality levels are appreciably low in the Northern region, they look higher than those in the other regions. The mortality levels do not seem to be smooth over the adult ages as Figure 3.3.3 below shows. The level is high at the younger adult ages, drops and rises again during older ages.

Kambia district has the lowest level in the region followed by Port Loko and Bombali districts. Tonkolili and Koinadugu districts have the highest levels.

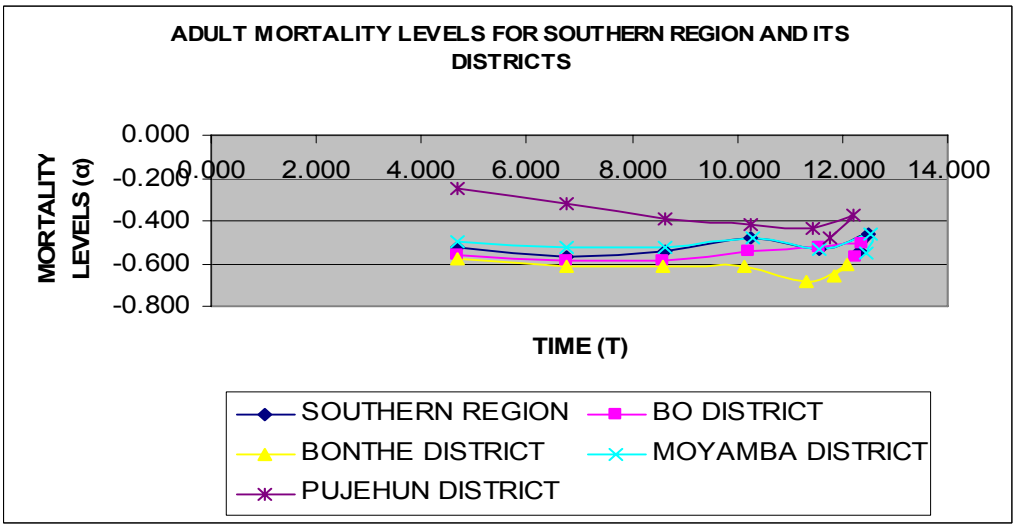
Fig 3.3.3 Adult mortality levels for Northern region and districts



Source: 2004 Population and Housing Census, Statistics Sierra Leone

Adult mortality levels in the Southern region show much improvement compared to the infant and childhood mortality levels. Apart from Pujehun district, which shows higher levels of adult mortality in the region, Bo, Bonthe, and Moyamba districts all have reasonably low levels of adult mortality. As Figure 3.3.4 below shows, apart from being higher, the mortality level for Pujehun district exhibits a pattern quite different from the other districts. While the mortality level for Pujehun district starts from being higher in the early adulthood years, drops sharply and begins to rise in older ages, the levels for the other three districts are shown to be stable over the adulthood ages.

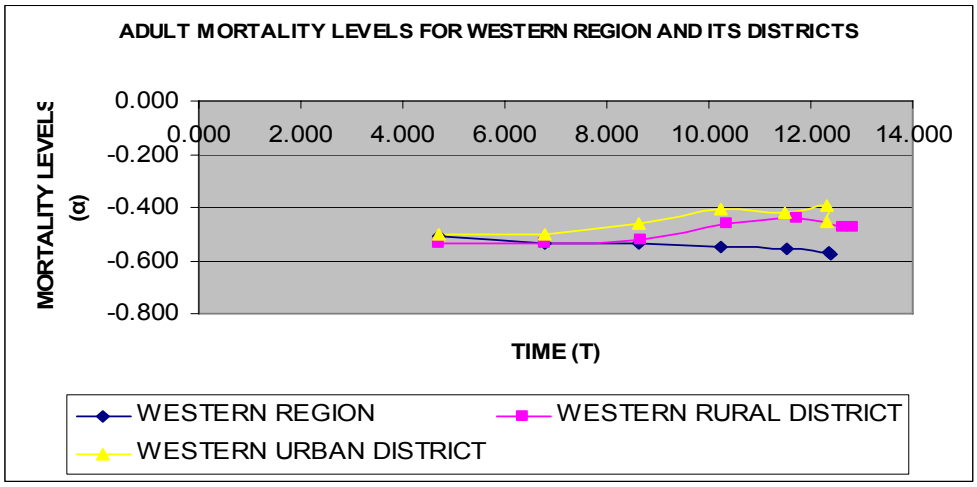
Fig 3.3.4 Adult mortality levels for the Southern region and districts



Source: 2004 Population and Housing Census, Statistics Sierra Leone

The Western region, according to the census results has performed better than the other regions in terms of the mortality levels. Probable reason for this is the much improved health situation of the region as compared to the other regions. As it was with the infant and child mortality levels, so it is that the region has the lowest adult mortality levels in the country. It is shown in Figure 3.3.5 below that the Western Rural district has lower mortality level than the Western Urban district. The regional level, at more advanced ages, is lower than the levels in the two districts.

Fig 3.3.5 Adult mortality level for the Western region and districts

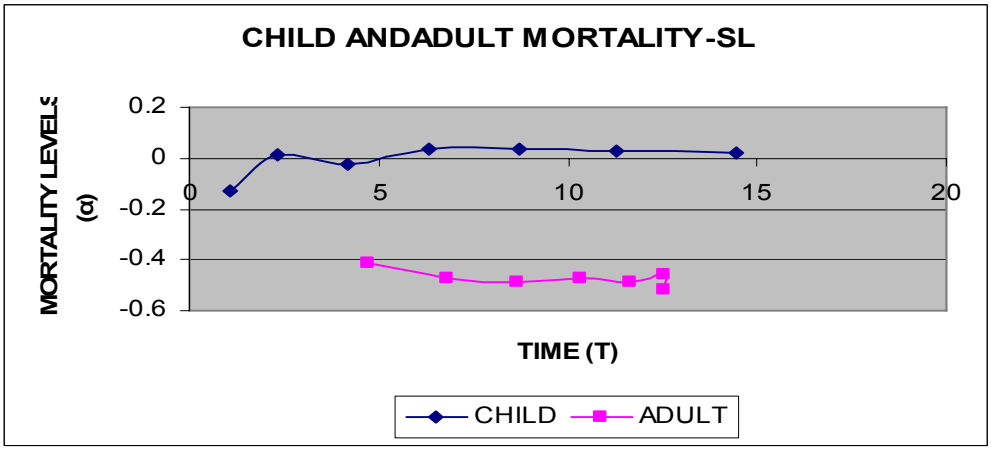


Source: 2004 Population and Housing Census, Statistics Sierra Leone

3.4 Adult and childhood mortality- a comparative analysis:

The results of the 2004 Population and Housing Census indicate clearly that although mortality levels (childhood and adult) are high in the country, childhood mortality levels are higher at national, regional and district levels. At national level, there is a significant difference between the levels as Figure 3.4.1 below shows.

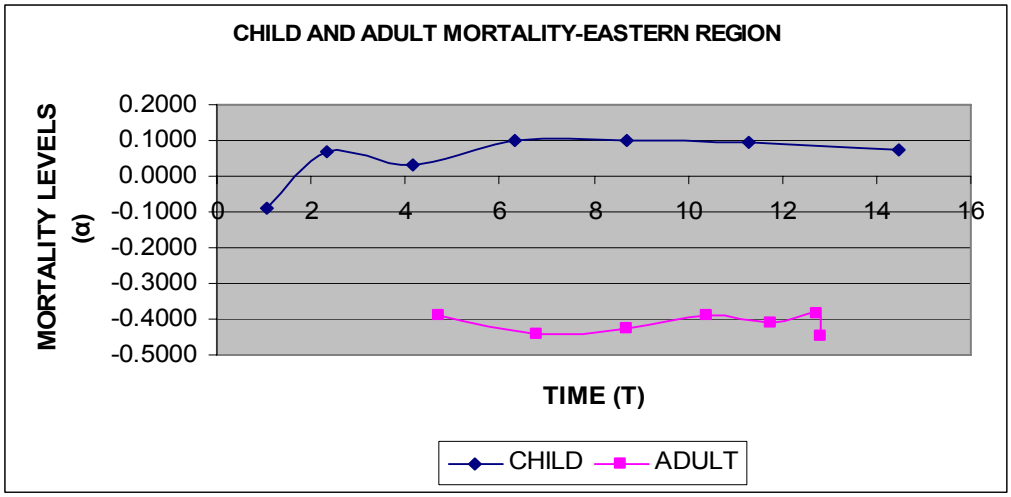
Fig. 3.4.1: Child and adult mortality levels in Sierra Leone



Source: 2004 Population and Housing Census, Statistics Sierra Leone

Differences in mortality levels at regional level follow the national pattern but the differences are more pronounced in some regions than the others. In the Eastern region, for example, child mortality is much higher than adult mortality. While mortality levels rise in the middle age range in childhood, they drop in the corresponding adult age range but level up again in increased ages in both cases as Figure 3.4.2 below indicates.

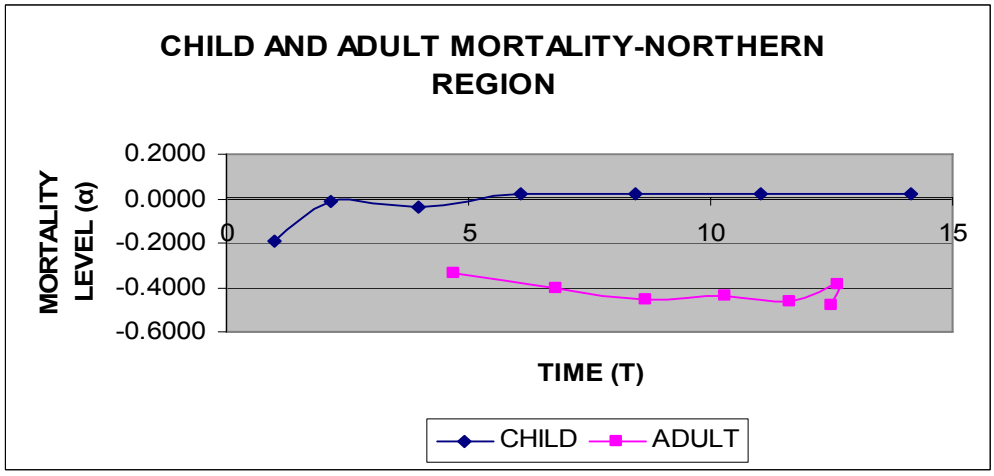
Fig.3.4.2: Child and adult mortality levels in the Eastern Region



Source: 2004 Population and Housing Census, Statistics Sierra Leone

Mortality levels in the Northern Region exhibit similar patterns of levels higher in childhood than in adulthood. However, child mortality levels show a more consistent pattern than adult mortality levels. As Figure 3.4.3 below indicates, the levels in child mortality show some fluctuations at the early childhood years but stabilize in advanced childhood ages. On the other hand, the levels in adult mortality show a steady drop from younger to older adult ages and rise again in advanced ages.

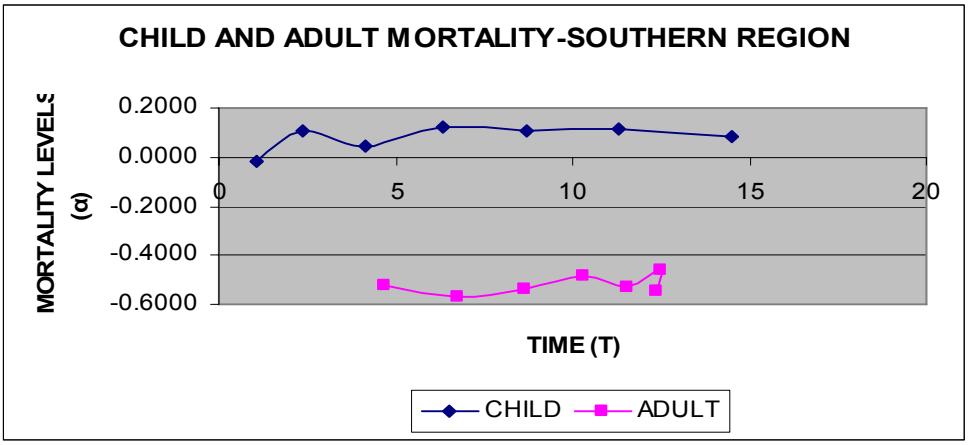
Fig. 3.4.3 Child and adult mortality levels in the Northern Region



Source: 2004 Population and Housing Census, Statistics Sierra Leone

Mortality levels in the Southern Region are similar to those in the Eastern Region, with child mortality levels significantly higher than adult mortality. At early childhood ages, mortality levels fluctuate but level up thereafter. Adult mortality levels show a reasonable stability through the ages as Figure 3.4.4 below shows.

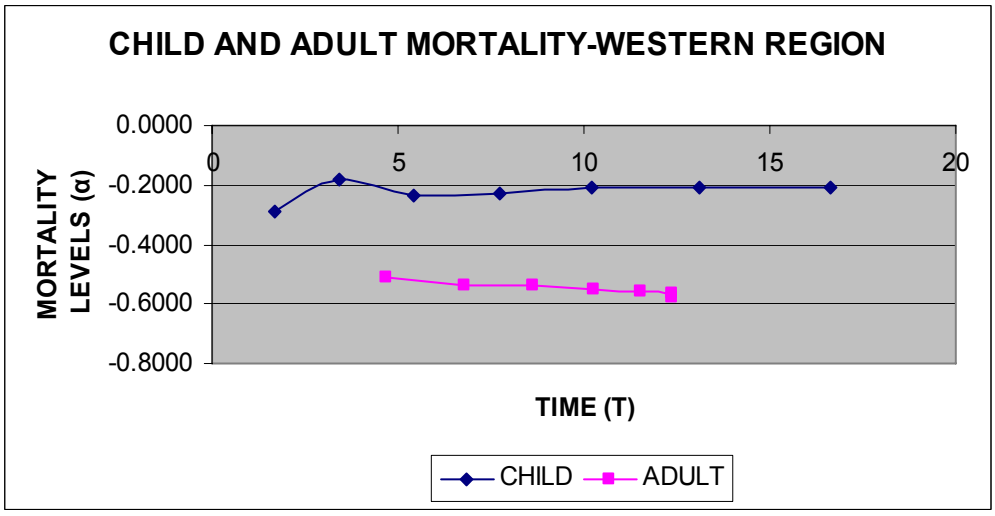
Fig. 3.4.4 Child and adult mortality levels in the Southern Region



Source: 2004 Population and Housing Census, Statistics Sierra Leone

The Western Region and the Northern Region have similar patterns in mortality levels. While differences between child and adult mortality exist, with higher levels for the former, the differences are not as significant as they are in the Southern and Eastern regions. According to Figure 3.4.5 below, childhood mortality levels rise and fall in early childhood but stabilize during advancing childhood ages. The adult mortality levels show an unusual pattern, instead of the levels rising with advance in age, they show a drop.

Fig. 3.4.5 Child and adult mortality levels-Western region



Source: 2004 Population and Housing Census, Statistics Sierra Leone

The pattern in child and adult mortality level differentials in the districts follows the national and regional patterns. Child mortality levels are higher than adult mortality levels in all the districts. The differences are more pronounced in some districts than in others. In the East, for example, differences in mortality levels in Kailahun district are not as significant as they are in Kenema and Kono districts. In the North, the gap between the two levels in Tonkolili district is narrower than it is in the other districts in the region. In the Western region, although there are differences in child and adult mortality levels in the two districts (Western Rural and Western Urban), they are not significant. There are however significant differences in child and adult mortality levels in the districts of Bo, Bonthe, Moyamba and Pujehun in the Southern region. Tables and Figures showing the differentials are in Annex 4 of the report.

4.0 IMMUNIZATION STATUS OF CHILDREN BORN TO MOTHERS 10-49 YEARS WITHIN 12 MONTHS PRECEDING THE CENSUS

4.1 Introduction

Child mortality especially infant mortality is influenced by immunization coverage among infants. Most of the causes of infant and under-five mortality are due to immunisable diseases of Tuberculosis, measles, diphtheria, whooping cough, poliomyelitis and tetanus. Before the age of 12 months a fully immunized child should have been immunized against all the diseases mentioned above. The schedule of Table 4.1.1 below indicates the age at which the child is considered immunized for age:

Table 4.1.1 Immunisation schedule indicating ages at which infants are immunised

Antigen/Vaccine	Disease Protected Against	Prescribed Age at immunisation
BCG	Tuberculosis	1 at birth or shortly after
DPT 1, 2 &3	Diphtheria, Pertusis & Tetanus	6, 10, 14 weeks
OPV 1, 2 &3	Polio	6, 10, 14 weeks
Measles	Measles	39 weeks

Sierra Leone attained the Universal Childhood Immunization (UCI) status with full immunisation coverage of infants at 75% by 1991. The gains in immunization were shattered during the decade old war when the immunization coverage dropped to about 39% in 2000. Since the cessation of the war in 2002 the government in collaboration with donors and UN Agencies like UNICEF and WHO made efforts to make the health system function again as in the years before the UCI. Peripheral Health Units were rehabilitated and needed preventive and curative services put in place. Most notable have been improvements in the immunisation of children to ensure better child survival outcomes with special emphasis on child mortality reduction

4.2 Immunization

During the 2004 Census, indicative questions on the immunization status of infants were asked; Mothers or primary caretakers of all children aged 0 to 11months (children born from December 4th 2003 to December 3rd 2004) were asked whether the child had been immunized for age.

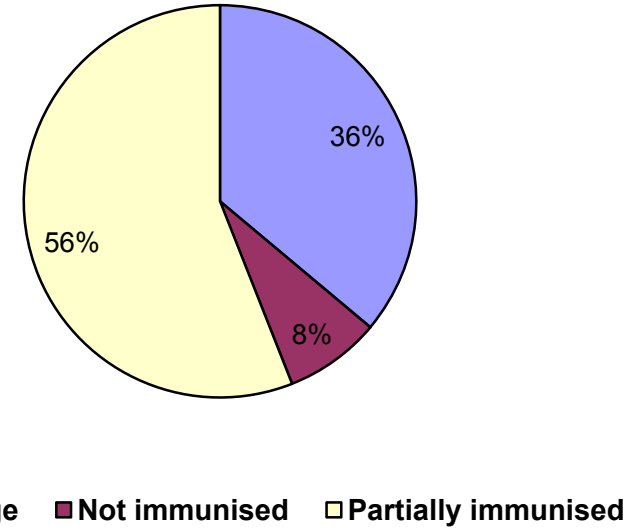
The percentage of infants who have been ***immunized for age*** measures the number of surviving infants that have been fully immunized for their age. Also included in this report is percentage of children who were ***partially immunized*** *and those who were* ***not immunized*** at all.

4.3 Immunization Status

Results of the immunisation status of infants in Sierra Leone during the census show that only 36 % of infants have been immunized for age (Figure 4.3.1). As said earlier this result is indicative of the low level of immunization in the country. A methodological immunisation coverage evaluation is needed to determine the current immunisation coverage in the country.

While 56% of infants were partially immunized, 8% of the children were not vaccinated against any antigen thereby exposing them to the risk of becoming infected with childhood killer diseases. The low level of immunization is probably a major contributing factor to the high levels of infant and early childhood mortality experienced in the country.

Fig 4.3.1: Percentage of Infants Immunised for Age in Sierra Leone, 2004



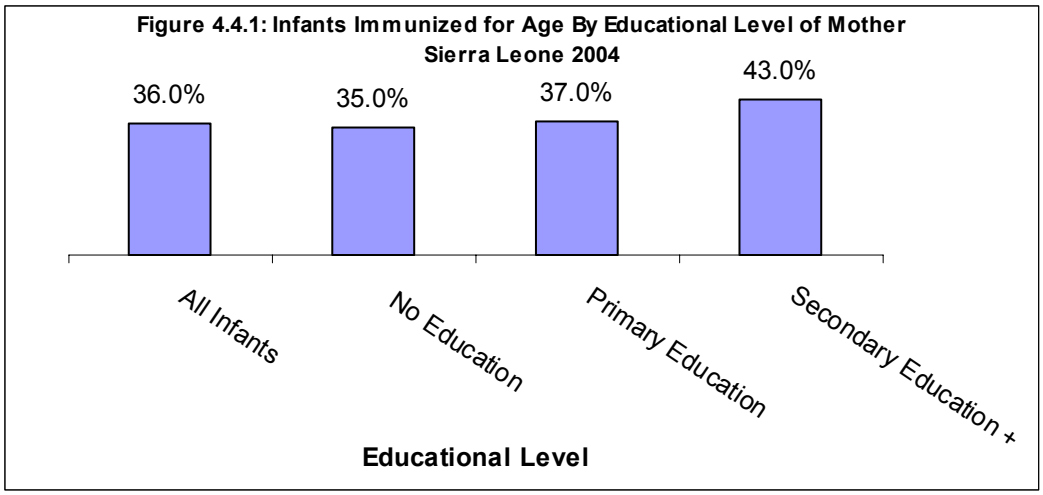
Source: 2004 National Population Census data, Statistics Sierra Leone

4.4 Differentials in immunization status

Differentials in the immunization status of infants by the educational level of mothers and by the administrative area of residence were looked at.

4.4.1 Educational Level of Mother

The data in Figure 4.4.1 show a clear pattern of increasing immunization status of the child to that of a higher level of education of the mother. Immunization status ranges from 35% among children born to mothers with no education to 43.0% among children of mothers with secondary or higher education. Whereas the former is below the national average by 1% difference, the latter is appreciably above the national average by 7%.



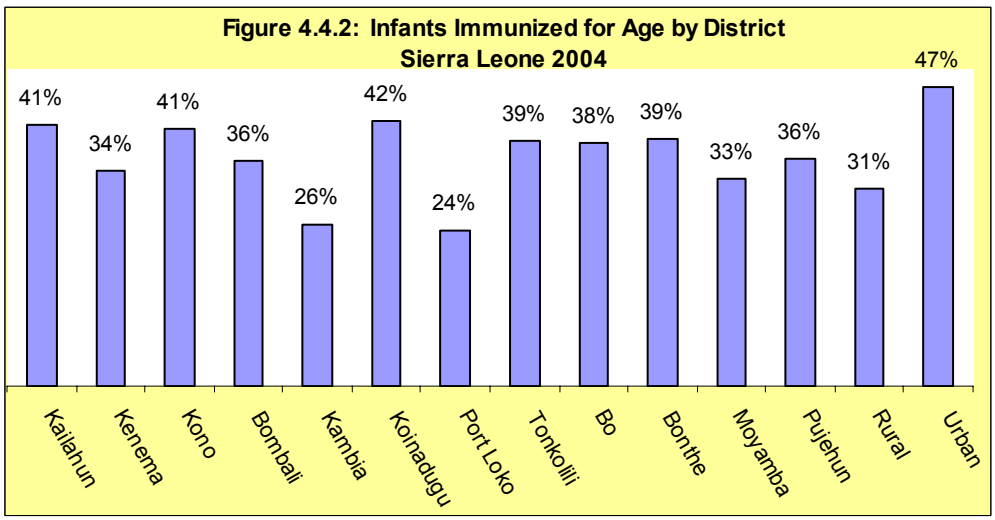
Source: 2004 National Population Census data, Statistics Sierra Leone

4.4.2 Administrative districts

The district results presented in Figure 4.4.2 show the differences in the immunization status among infants by their administrative area of residence. The district data for infants that have been immunized for age ranges from 48.4 percent in Western Area Urban to 21.9 percent in Port Loko district.

It is not surprising that Western Area Urban has the highest percentage of infants that have been immunized for age; it is in this region that Freetown the capital city lies and is seen to have better access to health facilities and information and communication on health service utilization than the other districts.

Tables 4.4.3 to 4.4.6 below give a very detailed picture of the immunization status among infants, by district and by education of mothers.



Source:2004 National Population Census data, Statistics Sierra Leone

Table 4.4.3: Immunization Status among Infants by District

	Imm for Age	Not Immunised	Partially Immunised	No. of Children
SIERRA LEONE	**36.1%**	**7.9%**	**56.0%**	**127640**
East	**38.4%**	**5.7%**	**55.9%**	**34365**
Kailahun	44.1%	5.8%	50.1%	9877
Kenema	34.1%	4.9%	61.0%	14534
Kono	39.1%	6.6%	54.3%	9954
North	**31.7%**	**10.8%**	**57.4%**	**44166**
Bombali	35.7%	6.8%	57.5%	9437
Kambia	28.0%	9.0%	63.0%	7501
Koinadugu	33.4%	19.2%	47.5%	5895
Port Loko	23.6%	12.4%	63.9%	11611
Tonkolili	39.4%	9.3%	51.3%	9722
South	**35.5%**	**7.7%**	**56.9%**	**31840**
Bo	35.9%	6.9%	57.2%	12751
Bonthe	33.1%	9.2%	57.7%	4673
Moyamba	34.3%	9.0%	56.6%	8109
Pujehun	37.8%	6.4%	55.8%	6307
West	**43.8%**	**5.3%**	**50.9%**	**17269**
Rural	32.7%	7.2%	60.1%	4125
Urban	47.3%	4.7%	48.0%	13144

Source: 2004 National Population Census data, Statistics Sierra Leone

Table 4.4.4: Mothers with No Education

Region	Imm for Age	Not Immunised	Partially Immunised	No. of Children
SIERRA LEONE	**34.9%**	**8.7%**	**56.3%**	**96713**
East	**38.2%**	**5.9%**	**55.9%**	**26590**
Kailahun	44.4%	6.0%	49.7%	7409
Kenema	33.5%	5.2%	61.3%	11114
Kono	39.0%	6.9%	54.1%	8067
North	**31.4%**	**11.6%**	**57.0%**	**37567**
Bombali	35.6%	7.2%	57.2%	7674
Kambia	28.0%	9.5%	62.4%	6450
Koinadugu	32.5%	19.9%	47.6%	5435
Port Loko	22.9%	13.2%	63.9%	9656
Tonkolili	39.2%	9.9%	50.9%	8352
South	**34.6%**	**8.2%**	**57.2%**	**24244**
Bo	34.6%	7.5%	57.9%	9195
Bonthe	31.1%	10.3%	58.6%	3701
Moyamba	33.9%	9.4%	56.8%	6391
Pujehun	38.1%	6.6%	55.3%	4957
West	**41.5%**	**6.3%**	**52.2%**	**8312**
Rural	31.2%	8.4%	60.4%	2296
Urban	45.4%	5.5%	49.1%	6016

Source: 2004 Population and Housing Census, Statistics Sierra Leone

Table 4.4.5: Mothers with Primary Education

Region	Imm for Age	Not Immunised	Partially Immunised	No. of Children
SIERRA LEONE	**37.0%**	**5.9%**	**57.1%**	**17273**
East	**38.2%**	**4.8%**	**57.0%**	**5132**
Kailahun	41.3%	5.2%	53.5%	1831
Kenema	33.9%	4.1%	62.0%	2055
Kono	40.6%	5.4%	54.0%	1246
North	**31.7%**	**6.9%**	**61.4%**	**4169**
Bombali	35.6%	5.2%	59.2%	1048
Kambia	25.5%	5.8%	68.7%	690
Koinadugu	42.0%	8.2%	49.8%	255
Port Loko	24.5%	10.0%	65.5%	1241
Tonkolili	38.7%	5.0%	56.3%	935
South	**36.6%**	**6.5%**	**56.9%**	**4841**
Bo	38.5%	5.8%	55.7%	2077
Bonthe	39.1%	5.3%	55.7%	627
Moyamba	32.6%	8.7%	58.7%	1163
Pujehun	35.8%	6.2%	58.0%	974
West	**42.7%**	**5.3%**	**52.0%**	**3131**
Rural	31.0%	7.7%	61.3%	874
Urban	47.2%	4.4%	48.3%	2257

Source: 2004 Population and Housing Census, Statistics Sierra Leone

Table 4.4.6: Mothers with Secondary Education +

Region	Imm for age	Not immunised	Partially immunised	No. of Children
SIERRA LEONE	**43.2%**	**4.6%**	**52.2%**	**13654**
East	**41.1%**	**4.5%**	**54.4%**	**2643**
Kailahun	48.2%	5.8%	46.0%	637
Kenema	39.6%	3.7%	56.7%	1365
Kono	37.4%	4.7%	57.9%	641
North	**36.9%**	**6.3%**	**56.8%**	**2430**
Bombali	37.6%	4.3%	58.0%	715
Kambia	31.6%	6.6%	61.8%	361
Koinadugu	45.4%	12.7%	42.0%	205
Port Loko	32.2%	6.4%	61.3%	714
Tonkolili	43.9%	6.0%	50.1%	435
South	**41.0%**	**4.8%**	**54.2%**	**2755**
Bo	39.9%	4.8%	55.3%	1479
Bonthe	44.1%	3.8%	52.2%	345
Moyamba	43.6%	5.6%	50.8%	555
Pujehun	38.6%	4.5%	56.9%	376
West	**47.8%**	**3.9%**	**48.3%**	**5826**
Rural	37.8%	4.0%	58.2%	955
Urban	49.8%	3.8%	46.4%	4871

Source: 2004 Population and Housing Census, Statistics Sierra Leone

5.0: DISABILITY PARTERNS WITHIN THE POPULATION

5.1 Introduction

In 1980, the World Health Organisation published the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) which provides a common framework and definitions of disability-related issues.

A person with a disability is defined as one who experiences any limitation in performing a daily-life activity in a manner considered normal for a person of his age, because of a long-term physical condition, mental condition or health problem. Disabilities are considered as long-term if they have lasted or are expected to last for more than six months.

The ICIDH distinguishes three dimensions to monitor the situation of people suffering from disabilities: impairment, disability and handicap.
The manual "Principles and Recommendations for Housing and Population Censuses" recommends that focus be on the disability dimension. The reasons given are as follows:

(i) In the impairment approach, the focus is at the organ or body level and therefore requires knowledge of specific medical details. Respondents would have the tendency to report only severe impairments. This approach will underestimate the population with disabilities;

(ii) The disability approach focuses on the person's experience in participating in daily life activities. Persons easily recognize mild and moderate limitations in daily life activities as well as severe ones;

(iii) The handicap approach examines the relationship between a person with a disability and the social and physical environment in which he lives. Some aspects of handicap can be measured by comparing the disabled persons with the non-disabled with respect to other social and economic characteristics.

Questions on disability in the 2004 Housing and Population Census were therefore in accordance with the recommendations set out in the manual "Principles and Recommendations for Housing and Population Censuses – Revision 1 of the United Nations Statistics Division" of 1998.

The questions asked at the Population Census were as follows:

a) "Is ----- disabled?"

If the person stated "Yes", he was then asked the following questions:

b) "Type of disability?"
c) "Cause of disability"
d) "Are you receiving any assistance?"

5.2 Prevalence of Disability

Analysis of the 2004 Population Census data revealed that 119,260 persons were reported as being disabled. Among the disabled population enumerated, 62,730 were males and 56,530 were females. The prevalence rate of disability within the population was 2.4%, comprising 2.6 among the males and 2.2 among the females. The male: female ratio of disability was 111:100. Even though the general male: female population ratio (95:100) indicates more females than males, the disability ratio has shown the reverse with more males than females being disabled.

The crude disability rate, defined as the number of disabled per 1,000 mid-year population, was 24.2 (26.0 for the males and 22.0 for the females).

The largest proportions of disabled were found in the Southern and Eastern Provinces with Bonthe district having the highest 37/1,000 and the least from Western Urban district 14/1,000 population (Table 5.2.1) below

Nevertheless, given that the number of disabled is also affected by the age structure of the population, it would be more appropriate to use the standardised disability rates to compare disability prevalence among districts. The standardised disability rate per 1,000 populations using the total population as the standard was therefore calculated for each district. The results showed that the districts of Kenema and Western Urban Bo, Kailahun and Bombali all had SDRs greater than or equal 2/1,000 population. Bonthe district had the least SDR of 1.05/1,000 population.

Regional variation in disability rates was also observed. The Southern Region had the highest percentage of disabled population in the country (2.9%) followed by the East (2.8%), the North (2.2%) and the West (1.7%) as shown in figure 5.2.1 and Table 5.2.1 below.

Figure 5.2.1: Percentage of disabilities in the Regions in Sierra Leone, 2004

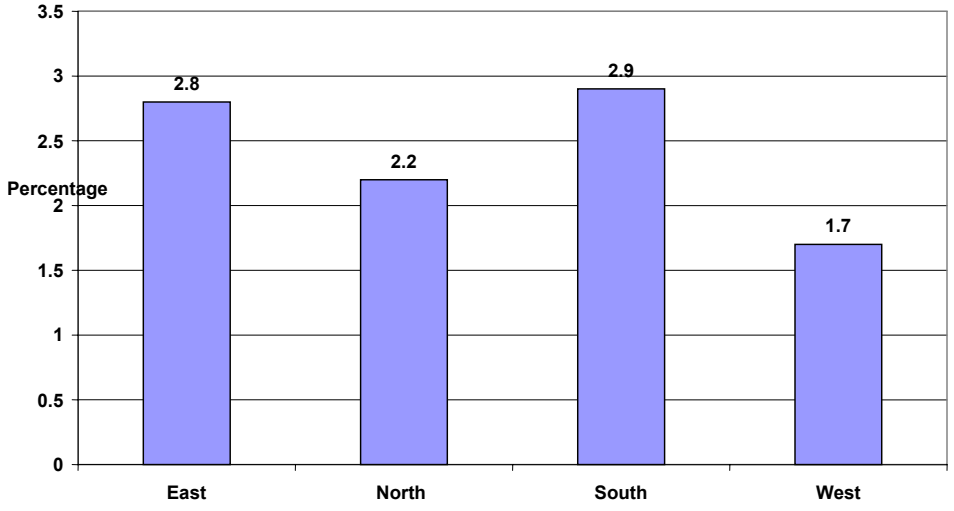


Table 5.2.1: Disabled Population by Region, District and Sex

Location	Number Disabled			Crude Disability Rate	Standard Disability Rate
	Male	Female	Both Sexes		
East	1,534	1,292	2,826	25.37	5.84
Kailahun	437	361	798	22.40	1.65
Kenema	654	569	1,223	25.75	2.53
Kono	443	362	805	28.44	1.66
North	1,801	1,756	3557	21.39	7.35
Bombali	508	505	1,013	25.84	2.09
Kambia	279	323	602	21.61	1.24
Koinadugu	205	223	428	17.96	0.88
Port Loko	416	379	795	18.99	1.64
Tonkolili	393	326	719	21.44	1.49
South	1,576	1,484	3,060	28.26	6.32
Bo	516	452	968	21.86	2.00
Bonthe	230	265	495	33.98	1.02
Moyamba	341	267	608	21.77	1.26
Pujehun	489	500	989	46.01	2.04
West	890	786	1,676	17.11	3.46
Rural	235	215	450	22.77	0.93
Urban	655	571	1,226	15.68	2.53
Total	**5,801**	**5,318**	**11,119**	**22.98**	**22.98**

Source: 2004 National Population Census data, Statistics Sierra Leone

5.3 Disability by Type, Sex and District

According to Table 5.3.1 below, the most common type of reported disability was "Limited use of legs" 21% (25630) of all disabled persons. This was followed by "Sight difficulty" 19.0% (22667), and Blindness 7 %(8916).

Table 5.3.1: Distribution of disability by type and Sex

Type of Disability	Male		Female		Total	
	#	%	#	%	#	%
Limited use of legs	13598	22%	12032	21%	25630	21%
Loss of Legs	1828	3%	1532	3%	3360	3%
Limited use of Arm	4481	7%	2968	5%	7449	6%
Loss of Arms	775	1%	481	1%	1256	1%
Back spine	3725	6%	3374	6%	7099	6%
Hearing difficulty	4150	7%	4308	8%	8458	7%
Deafness	1367	2%	1561	3%	2928	2%
Sight difficulty	12239	20%	10428	18%	22667	19%
Blindness	5170	8%	3746	7%	8916	7%
Speech difficulty	1461	2%	1025	2%	2486	2%
Mute	1731	3%	1611	3%	3342	3%
Mental problem	1707	3%	1722	3%	3429	3%
Strange behaviour	1452	2%	1433	3%	2885	2%
Epileptic	1408	2%	1384	2%	2792	2%
Rheumatism	2581	4%	3492	6%	6073	5%
Others	5057	8%	5433	10%	10490	9%
Total	**62730**	100%	**56530**	100%	**119260**	100%

Source: 2004 National Population Census data, Statistics Sierra Leone

The table also indicates that sight difficulty (including blindness), limited use of arms and limited use of legs were more prevalent among the males than female population. Conversely hearing difficulty was more prevalent among the female than the male population, represented by 8% and 7% respectively. Loss of limb (arm or leg) accounted for 3% of the disabilities among both males and females

Table 5.3.2 below shows the prevalence of different causes of disabilities by sex and age group. According to the table, cause of most forms of disabilities increases with increase in age. Consistently there were greater disabilities among the male population than the female population in most of the types of disabilities except in the cases of natural illness and disability from aging

Table 5.3.2: Distribution of disability in the population by cause, sex and age group

	Total Persons	Not disabled	Disabled	From birth	Natural Illness	Trans. Accident	Occ. Injury	Other Accidents	War	Aging	Others	Number disabled
Sierra Leone	**4928578**	**97.6%**	**2.4%**	**11.8%**	**45.2%**	**2.9%**	**4.6%**	**8.9%**	**9.5%**	**11.7%**	**5.4%**	**119260**
00-04.	751518	15.2%	0.1%	32.2%	39.2%	1.0%	0.7%	5.1%	2.6%	6.6%	12.7%	4453
05-14.	1303915	26.1%	0.3%	25.7%	44.0%	1.8%	1.3%	9.3%	5.3%	6.7%	5.9%	16890
15-24.	950482	19.0%	0.3%	18.6%	46.5%	2.5%	2.5%	9.3%	8.3%	6.5%	5.6%	15306
25+	1922663	37.3%	1.7%	6.6%	45.6%	3.2%	5.8%	8.9%	10.9%	14.0%	4.9%	82611
Males	**2390977**	**47.2%**	**1.3%**	**11.9%**	**42.5%**	**3.5%**	**6.0%**	**10.3%**	**10.8%**	**9.9%**	**5.2%**	**62730**
00-04.	373855	7.5%	0.0%	32.8%	38.8%	0.9%	0.6%	5.3%	2.5%	6.4%	12.8%	2376
05-14.	657582	13.2%	0.2%	25.6%	42.8%	2.0%	1.6%	10.0%	5.3%	6.8%	5.9%	9340
15-24.	450543	9.0%	0.2%	19.1%	43.8%	2.8%	2.9%	10.7%	8.9%	6.6%	5.3%	8093
25+	908997	17.6%	0.9%	6.5%	42.4%	4.1%	7.9%	10.5%	12.7%	11.3%	4.6%	42921
Females	**2537601**	**50.3%**	**1.1%**	**11.7%**	**48.3%**	**2.2%**	**2.9%**	**7.4%**	**8.1%**	**13.8%**	**5.7%**	**56530**
00-04.	377663	7.6%	0.0%	31.5%	39.7%	1.1%	0.7%	4.9%	2.6%	6.8%	12.7%	2077
05-14.	646333	13.0%	0.2%	25.7%	45.5%	1.6%	1.0%	8.5%	5.3%	6.5%	5.9%	7550
15-24.	499939	10.0%	0.1%	18.2%	49.4%	2.3%	2.1%	7.8%	7.7%	6.5%	6.0%	7213
25+	1013666	19.8%	0.8%	6.8%	49.0%	2.3%	3.5%	7.2%	9.0%	16.9%	5.2%	39690

Source: 2004 National Population Census data, Statistics Sierra Leone

Table 5.3.3 below shows the distribution of some common disabilities in the regions and districts by sex. Though the table shows no clear pattern in the distribution of disability by district, the Western Urban, Koinadugu and Bonthe districts consistently show lower levels of disability than the other districts. Also, the Western Urban district has the highest percentage of persons suffering from loss of limbs followed by districts in the North. A possible reason for this is due to the presence of a disability centre in the Western Area.

Table 5.3.3: Distribution of common disabilities in the regions, districts by sex

Location	Number		Limited use of Legs		Limited use of Arms		Loss of limbs		Hearing difficulties and deafness		Sight Difficulties and blindness		Others	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
SIERRA LEONE	**62730**	**56530**	**21.7%**	**21.3%**	**7.1%**	**5.3%**	**4.1%**	**3.6%**	**8.8%**	**10.4%**	**27.8%**	**25.1%**	**30.5%**	**34.4%**
EAST	**18150**	**15422**	**21.2%**	**20.9%**	**7.3%**	**5.1%**	**3.7%**	**3.3%**	**10.3%**	**11.7%**	**26.3%**	**22.1%**	**31.3%**	**36.8%**
Kailahun	5474	4862	24.3%	25.0%	8.8%	6.0%	4.7%	4.1%	11.2%	12.1%	22.4%	20.9%	28.6%	31.9%
Kenema	7343	6287	18.8%	17.8%	5.7%	3.9%	2.8%	2.6%	9.7%	11.6%	27.9%	21.7%	35.1%	42.4%
Kono	5333	4273	21.3%	20.9%	7.9%	5.8%	3.9%	3.5%	10.1%	11.5%	28.0%	24.2%	28.8%	34.2%
NORTH	**19656**	**17974**	**22.6%**	**23.1%**	**7.5%**	**5.8%**	**5.0%**	**4.6%**	**8.6%**	**9.7%**	**29.3%**	**28.1%**	**26.9%**	**28.6%**
Bombali	5174	4695	23.3%	24.2%	7.5%	5.2%	5.3%	4.5%	8.8%	10.5%	28.2%	27.7%	26.8%	27.8%
Kambia	2762	2713	23.5%	22.2%	8.2%	5.6%	5.3%	4.0%	8.5%	10.9%	30.4%	30.3%	24.1%	26.9%
Koinadugu	2841	2710	20.6%	21.1%	6.9%	5.5%	5.4%	5.1%	8.4%	8.5%	26.1%	24.2%	32.5%	35.6%
Port Loko	5047	4434	22.3%	22.9%	7.2%	6.1%	4.5%	4.1%	8.3%	9.7%	29.1%	27.5%	28.7%	29.6%
Tonkolili	3832	3422	22.8%	24.0%	7.8%	6.8%	4.9%	5.3%	9.1%	8.7%	32.7%	31.0%	22.7%	24.2%
SOUTH	**16444**	**15527**	**18.4%**	**18.6%**	**6.6%**	**4.9%**	**2.9%**	**2.6%**	**8.4%**	**10.6%**	**31.0%**	**25.4%**	**32.6%**	**38.0%**
Bo	5796	5051	20.3%	20.6%	7.2%	5.3%	3.2%	3.1%	8.6%	11.7%	30.7%	25.2%	30.1%	34.0%
Bonthe	2511	2656	18.8%	18.0%	6.3%	4.1%	2.7%	2.3%	5.8%	7.8%	26.9%	25.1%	39.6%	42.7%
Moyamba	3922	3714	17.4%	18.2%	5.3%	5.3%	3.4%	2.7%	8.0%	10.2%	36.7%	29.1%	29.2%	34.5%
Pujehun	4215	4106	16.6%	16.9%	7.2%	4.4%	2.4%	2.2%	10.2%	11.3%	28.6%	22.4%	35.0%	42.9%
WESTERN AREA	**8480**	**7607**	**26.9%**	**23.3%**	**7.1%**	**4.9%**	**5.4%**	**3.5%**	**6.8%**	**8.8%**	**20.9%**	**23.1%**	**32.9%**	**36.2%**
WR	2715	2715	19.5%	19.5%	6.0%	6.0%	4.2%	4.2%	6.6%	6.6%	16.6%	16.6%	47.1%	47.1%
WU	5765	5014	30.3%	26.4%	7.6%	5.9%	5.9%	3.9%	6.8%	10.1%	22.9%	25.0%	26.3%	28.7%

Source: 2004 National Population Census data, Statistics Sierra Leone

5.4 Disability by Cause

Table 5.4.1: Cause of disabilities by region and by sex

Location	Sex	From Birth	Illness	Motor Accident	Occ. Injury	Other Accident	War	Aging	Others	Number with disability
SIERRA LEONE	**Total**	**11.8%**	**45.2%**	**3%**	**4.6%**	**9%**	**9.5%**	**12%**	**5.4%**	**119,260**
	Male	11.9	42.5%	4%	6%	10%	10.8%	10%	5.2%	62,730
	Female	11.7%	48.3%	2%	3%	7.4%	8.1%	14%	5.7%	56,530
EAST	**Total**	**11.5%**	**43.6%**	**3%**	**4.8%**	**8.3%**	**13.1%**	**10.8%**	**5.2%**	**33,572**
	Male	11.5%	40.4%	3.4%	6.2%	9.6%	15%	9.3%	5%	18,150
	Female	11.5%	47.3%	2%	3.1%	6.7%	11%	12.7%	5.9%	15,422
NORTH	**Total**	**12.9%**	**47.4%**	**3%**	**4.4%**	**9.2%**	**6.2%**	**11.2%**	**6%**	**37,630**
	Male	1.9%	45.2%	3.4%	5.7%	10.7%	7.1%	9.3%	6%	19,656
	Female	12.9%	49.9%	2.5%	2.9%	7.6%	5.3%	13.2%	6%	17,974
SOUTH	**Total**	**10.0%**	**46.4%**	**2.2%**	**5.2%**	**8.6%**	**10.2%**	**13%**	**5%**	**31,971**
	Male	10.0%	43.2%	3%	7.2%	10.1%	11.4%	11%	5%	16,444
	Female	10.0%	49.7%	2%	3.1%	6.9%	9%	14.8%	5%	15,527
WEST	**Total**	**13.7%**	**41.3%**	**4.2%**	**3.4%**	**10%**	**8.1%**	**12.7%**	**6.6%**	**16,087**
	Male	14.5%	39.3%	5.2%	4.2%	11.1%	9.2%	10.1%	6.3%	8480
	Female	12.7%	43.5%	3.0%	2.5%	8.9%	6.9%	15.6%	6.8%	7607

Source: 2004 National Population Census data, Statistics Sierra Leone

Table 5.4.1 above shows the distribution of causes of disability by region and by sex. Apart from illness, which accounts for the highest cause of disability, congenital, Aging, Accidents (including motor accidents) and war were the major causes of disability in the country. War as a cause of disability was highest in the Eastern province (13%), followed by Southern province (10%), then Western Area (8%) and Northern province (6%), which showed war as the least cause of disability.

There were sex differentials in the cause of disability, which was skewed towards males. There were higher levels of disability in males than females in accidents, occupational injuries and war. Causes of disability from aging and illness were more pronounced in females than males.

5.5: School Attendance and Disability

This section attempts to shed light on the educational profile of the population of disabled persons.

From table 5.5.1 below, it can be seen that disabled persons are less likely to attend school than non-disabled persons. The proportion of disabled aged 6 -29 years who were not attending school was 68% compared to 56% for non-disabled persons. These differences were more pronounced among children aged 10-14 years of age: 41% versus 25% of non-school attendance among disabled and non-disabled children respectively. Similar to the situation among normal children, non-school attendance is more common among disabled females (73%) than disabled males 64%.

Table 5.5.1: Percentage of school attendance among disabled and non-disabled persons, by age and by sex

Age groups/ Sex	% Not Attending		% Attending		Total Number	
	Not disabled	Disabled	Not disabled	Disabled	Not disabled	Disabled
Both Sexes	**56%**	**68%**	**44%**	**32%**	**2618914**	**40703**
06-09	48%	57%	52%	43%	729262	8814
10-14	25%	41%	75%	59%	557763	8400
15-19	50%	61%	50%	39%	528124	8383
20-24	83%	88%	17%	12%	407052	7065
25-29	97%	98%	3%	2%	396713	8041
Males	**51%**	**64%**	**49%**	**36%**	**1267461**	**21968**
06-09	48%	56%	52%	44%	361546	4878
10-14	23%	38%	77%	62%	286696	4644
15-19	38%	52%	62%	48%	257306	4476
20-24	74%	82%	26%	18%	185144	3689
25-29	96%	97%	4%	3%	176769	4281
Females	**62%**	**73%**	**38%**	**27%**	**1351453**	**18735**
06-09	48%	59%	52%	41%	367716	3936
10-14	28%	45%	72%	55%	271067	3756
15-19	61%	72%	39%	28%	270818	3907
20-24	90%	94%	10%	6%	221908	3376
25-29	99%	99%	1%	1%	219944	3760

Source: 2004 National Population Census data, Statistics Sierra Leone

Table 5.5.2: Percentage distribution of cause of disability among non-school going disabled 6-29 year olds by sex

Sex/Age group	Congen-ital from Birth	Natural Illness	Motor Accident	Occu. Injury	Other Accidents	War	Aging	Others	Total disabled not attending school
Both Sexes	**20.4%**	**45.3%**	**2.4%**	**2.6%**	**8.2%**	**8.0%**	**6.9%**	**6.2%**	**27718**
06-09	5.3%	8.0%	0.2%	0.2%	1.2%	0.7%	1.2%	1.4%	5040
10-14	3.5%	5.5%	0.2%	0.1%	0.8%	0.6%	1.0%	0.7%	3466
15-19	3.7%	8.7%	0.4%	0.4%	1.5%	1.4%	1.3%	1.0%	5119
20-24	3.8%	10.5%	0.6%	0.7%	1.9%	2.1%	1.5%	1.4%	6210
25-29	4.0%	12.5%	1.0%	1.2%	2.8%	3.2%	1.8%	1.8%	7883
Males	**10.5%**	**21.4%**	**1.4%**	**1.7%**	**4.6%**	**4.6%**	**3.6%**	**3.0%**	**14045**
06-09	2.9%	4.3%	0.1%	0.1%	0.7%	0.4%	0.7%	0.7%	2736
10-14	1.9%	2.7%	0.1%	0.1%	0.4%	0.4%	0.6%	0.4%	1778
15-19	1.8%	3.7%	0.2%	0.2%	0.8%	0.7%	0.6%	0.5%	2325
20-24	1.9%	4.8%	0.3%	0.5%	1.0%	1.2%	0.8%	0.6%	3043
25-29	2.1%	5.9%	0.7%	0.9%	1.7%	2.0%	1.0%	0.8%	4163
Females	**10.0%**	**23.9%**	**1.0%**	**0.9%**	**3.6%**	**3.4%**	**3.3%**	**3.2%**	**13673**
06-09	2.4%	3.7%	0.1%	0.1%	0.5%	0.3%	0.6%	0.6%	2304
10-14	1.7%	2.9%	0.1%	0.1%	0.4%	0.3%	0.4%	0.3%	1688
15-19	1.9%	5.0%	0.2%	0.2%	0.7%	0.7%	0.7%	0.5%	2794
20-24	1.9%	5.7%	0.3%	0.3%	0.9%	0.9%	0.7%	0.7%	3167
25-29	2.0%	6.5%	0.4%	0.3%	1.1%	1.2%	0.9%	1.0%	3720

Source: 2004 National Population Census data, Statistics Sierra Leone

Table 5.5.2 above indicates that natural illness, congenital, accidents (motor, occupational and other accidents), and war accounted for the major causes of disability among non school going persons. While more females reported natural illness (23.9%) as major cause of their disabilities than males (21.4%), there were slight differences between the two sexes in terms of other causes of disability

5.6 Level of education

Table 5.6.1 below shows the distribution of the disabled population aged 10 years and over by educational attainment. Level of formal educational attainment for all ages in the population is low. However level of formal education in the disabled population is significantly lower than that in the non-disabled population. This difference is more distinct in the population that attained formal education beyond the primary school. Similarly female level of educational attainment is lower than that of males beyond the primary schools.

Table 5.6.1: Educational attainment of disabled and non-disabled population

Level of Education Attained	Non Disabled			Disabled		
	Both Sexes	Male	Female	Both Sexes	Male	Female
None/others	71.4%	62.0%	79.1%	77.5%	69.5%	85.9%
Primary	11.1%	12.4%	10.0%	9.8%	11.7%	7.8%
JSS.	6.6%	8.6%	4.9%	4.6%	6.3%	2.8%
SSS.	5.4%	8.3%	3.1%	3.2%	4.8%	1.6%
Voc/Commercial	2.2%	2.8%	1.7%	1.6%	2.1%	1.0%
Teachers	0.8%	1.2%	0.4%	0.5%	0.8%	0.3%
Technical.	0.2%	0.4%	0.1%	0.1%	0.2%	0.0%
Nursing.	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%
Cert/Diploma	0.4%	0.6%	0.2%	0.3%	0.4%	0.1%
First Degree	0.4%	0.8%	0.2%	0.2%	0.3%	0.1%
Post Graduate	0.1%	0.3%	0.0%	0.1%	0.1%	0.0%
Koranic	1.4%	2.7%	0.3%	2.0%	3.7%	0.3%

5.7: Activity status among disabled population ten years and above by sex and type of disability

Tables 5.7.1 a, b, and c below indicate that most of the disabled are either self employed or not formally working for a livelihood; most of them are involved in street begging. Out of 17% of those not working, only 2% are looking for employment. There is a significant difference between male paid workers (2.2%) and female paid workers (0.5%). Generally disabled females are engaged in unpaid household work (12.6%), significantly greater than the disabled males (6.9%) who were engaged in unpaid household work

Table 5.7.1a (Both sexes)

Disability	Paid Work	Self Employed	Unpaid Work	Looking, Not Working,	Not Looking, not Working	HH Work	Student	Retired	Others	Total Number
Both Sexes	**2.6%**	**35.7%**	**9.4%**	**1.7%**	**15.6%**	**10.1%**	**8.2%**	**1.7%**	**15.1%**	**113827**
In Use of Legs	0.8%	7.6%	1.9%	0.5%	3.0%	2.2%	2.7%	0.4%	3.5%	25630
In Loss of Legs	0.1%	0.9%	0.2%	0.1%	0.4%	0.2%	0.3%	0.0%	0.7%	3360
Use of Arms	0.2%	2.3%	0.6%	0.1%	0.7%	0.6%	0.8%	0.1%	1.1%	7449
Loss of Arms	0.0%	0.4%	0.1%	0.0%	0.2%	0.1%	0.1%	0.0%	0.1%	1256
Back Spine	0.2%	2.9%	0.7%	0.1%	0.8%	0.8%	0.3%	0.1%	0.4%	7099
Hearing Difficulty	0.1%	2.6%	0.7%	0.1%	0.5%	0.8%	0.8%	0.1%	1.6%	8458
Deafness	0.0%	0.9%	0.3%	0.0%	0.3%	0.3%	0.2%	0.0%	0.5%	2928
Sight Difficulty	0.6%	8.5%	2.0%	0.3%	3.3%	2.1%	1.0%	0.5%	1.6%	22667
Blindness	0.1%	1.9%	0.6%	0.1%	3.2%	0.7%	0.2%	0.3%	0.8%	8916
Speech Impairment	0.1%	0.6%	0.2%	0.0%	0.2%	0.2%	0.3%	0.0%	0.6%	2486
Unable to Speak	0.0%	0.7%	0.3%	0.0%	0.3%	0.3%	0.3%	0.0%	1.0%	3342
Mental Retardation	0.0%	0.7%	0.3%	0.1%	0.6%	0.4%	0.2%	0.0%	0.7%	3429
Mental illness	0.0%	0.6%	0.2%	0.0%	0.7%	0.3%	0.2%	0.0%	0.4%	2885
Epileptic	0.0%	0.7%	0.3%	0.0%	0.4%	0.3%	0.2%	0.0%	0.5%	2792
Rheumatism	0.1%	2.4%	0.5%	0.0%	0.6%	0.7%	0.3%	0.1%	0.7%	6073
Others	0.2%	3.7%	1.0%	0.1%	0.9%	1.1%	0.6%	0.1%	1.5%	10490

Source: 2004 Population and Housing Census, Statistics Sierra Leone

Table 5.7.1b (Males)

Disability	Paid Work	Self Employed	Unpaid Work	Looking, Not Working,	Not Looking, not Working	HH Work	Student	Retired	Others	Total Number
Males	**2.2%**	**22.4%**	**4.9%**	**1.2%**	**7.6%**	**2.0%**	**5.3%**	**0.9%**	**8.7%**	**62730**
In Use of Legs	0.6%	4.6%	0.9%	0.3%	1.3%	0.4%	1.7%	0.2%	1.8%	13598
In Loss of Legs	0.1%	0.5%	0.1%	0.1%	0.2%	0.1%	0.2%	0.0%	0.4%	1828
Use of Arms	0.2%	1.6%	0.4%	0.1%	0.4%	0.1%	0.5%	0.0%	0.6%	4481
Loss of Arms	0.0%	0.3%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	775
Back Spine	0.1%	1.8%	0.4%	0.1%	0.3%	0.1%	0.1%	0.0%	0.2%	3725
Hearing Difficulty	0.1%	1.4%	0.3%	0.1%	0.2%	0.1%	0.5%	0.0%	0.9%	4150
Deafness	0.0%	0.4%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.3%	1367
Sight Difficulty	0.5%	5.5%	1.0%	0.2%	1.4%	0.3%	0.6%	0.3%	0.9%	12239
Blindness	0.1%	1.2%	0.3%	0.0%	1.9%	0.2%	0.1%	0.2%	0.5%	5170
Speech Impairment	0.1%	0.4%	0.1%	0.0%	0.1%	0.1%	0.2%	0.0%	0.4%	1461
Unable to Speak	0.0%	0.4%	0.2%	0.0%	0.1%	0.1%	0.2%	0.0%	0.6%	1731
Mental Retardation	0.0%	0.3%	0.1%	0.0%	0.3%	0.1%	0.1%	0.0%	0.4%	1707
Mental illness	0.0%	0.3%	0.1%	0.0%	0.4%	0.1%	0.1%	0.0%	0.2%	1452
Epileptic	0.0%	0.4%	0.1%	0.0%	0.2%	0.1%	0.1%	0.0%	0.3%	1408
Rheumatism	0.1%	1.2%	0.2%	0.0%	0.2%	0.1%	0.2%	0.0%	0.3%	2581
Others	0.2%	2.1%	0.5%	0.1%	0.3%	0.1%	0.3%	0.0%	0.8%	5057

Source: 2004 Population and Housing Census, Statistics Sierra Leone

Table 5.7.1c (Females)

Disability	Paid Work	Self Employed	Unpaid Work	Looking , Not Working,	Not Looking, not Working	HH Work	Student	Retired	Others	Total Number
Females	**0.5%**	**13.3%**	**4.5%**	**0.5%**	**8.0%**	**8.1%**	**2.9%**	**0.7%**	**6.5%**	**51097**
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
In Use of Legs	0.1%	3.0%	1.0%	0.2%	1.7%	1.8%	1.0%	0.2%	1.6%	12032
In Loss of Legs	0.0%	0.3%	0.1%	0.0%	0.2%	0.2%	0.1%	0.0%	0.3%	1532
Use of Arms	0.0%	0.7%	0.2%	0.0%	0.3%	0.4%	0.3%	0.0%	0.5%	2968
Loss of Arms	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%	481
Back Spine	0.0%	1.1%	0.4%	0.0%	0.5%	0.6%	0.1%	0.0%	0.2%	3374
Hearing Difficulty	0.0%	1.2%	0.4%	0.0%	0.4%	0.7%	0.3%	0.0%	0.7%	4308
Deafness	0.0%	0.4%	0.2%	0.0%	0.2%	0.2%	0.1%	0.0%	0.2%	1561
Sight Difficulty	0.1%	3.0%	0.9%	0.1%	1.9%	1.8%	0.4%	0.2%	0.8%	10428
Blindness	0.0%	0.7%	0.3%	0.0%	1.3%	0.5%	0.1%	0.1%	0.3%	3746
Speech Impairment	0.0%	0.2%	0.1%	0.0%	0.1%	0.2%	0.1%	0.0%	0.2%	1025
Unable to Speak	0.0%	0.3%	0.1%	0.0%	0.1%	0.2%	0.1%	0.0%	0.5%	1611
Mental Retardation	0.0%	0.3%	0.1%	0.0%	0.3%	0.3%	0.1%	0.0%	0.3%	1722
Mental illness	0.0%	0.3%	0.1%	0.0%	0.3%	0.2%	0.1%	0.0%	0.2%	1433
Epileptic	0.0%	0.3%	0.2%	0.0%	0.2%	0.2%	0.1%	0.0%	0.2%	1384
Rheumatism	0.0%	1.2%	0.3%	0.0%	0.4%	0.6%	0.1%	0.1%	0.4%	3492
Others	0.0%	1.7%	0.5%	0.0%	0.5%	1.0%	0.2%	0.0%	0.7%	5433

Source: 2004 Population and Housing Census, Statistics Sierra Leone

6.0 CONCLUSIONS AND IMPLICATIONS

The country has exhibited high infant and child mortality over the years. Although there is evidence of gradual improvement in infant and child mortality during the intercensal periods (1974 – 1985, 1985 - 2004), the improvements have been gradual. There is the need to step up policies geared towards the reduction of infant and child mortality. These would take the form of measures to improve pre-natal and post natal medical facilities; the prevention of killer deceases like malaria, diarrhea and measles. More attention should be paid to the Southern Province and in particular Pujehun district that has consistently exhibited the highest infant and child mortality rates over the period under consideration.

In the area of the life expectancy at birth, there is moderate improvement over the years and the life expectancy of the people has increased from an average of 38.5 years in 1985 to 48.4 years in 2004. This is however way below figures exhibited in most African countries and there is need for improvement in this area. This can be achieved by improvements in the living standards of the people.

Up to date, about 36.1% of children in the country have been fully immunized and the figure is far from the achievement of the millennium development goal 4 aimed at reducing under-five mortality rates by two thirds between 1990 and 2015. Measures must be put in place to achieve at least the 75% target as stipulated by the millennium development goals. This can be done by building the capacity of the Ministry of Heath and Sanitation and embarking on a vigorous nation-wide campaign to educate the masses of the benefits of immunization.

Disability rate, recorded as 2.4% for the country, is considered relatively high for a population of about five million persons. In the area of infant and childhood disability, mostly caused by polio and measles, measures to reduce the incidence are crucial for the growth of a healthy child. Such measures include pre-natal medical care for the mother and timely immunization of the newborn baby. Adulthood disabilities are often caused by accidents (road and occupational) It is important to regulate road traffic rules, especially those related to ‘speed limits’. Like the mortality rates, attention has to be given to the Southern Province exhibiting the highest rate of disability in the country.

ANNEX 1: BRASS GROWTH BALANCE METHOD

Table A1.1: Partial births and partial deaths, Sierra Leone

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0357	0.0155
10 – 14 . . .	0.0379	0.0169
15 – 19 . . .	0.0384	0.0191
20 – 24 . . .	0.0407	0.0218
25 – 29 . . .	0.0426	0.0240
30 – 34 . . .	0.0472	0.0277
35 – 39 . . .	0.0507	0.0316
40-44..	0.0566	0.0381
45-49..	0.0563	0.0442
50-54..	0.0591	0.0530
55-59…	0.0549	0.0610
60-64..	0.0569	0.0712

Fig A1.1

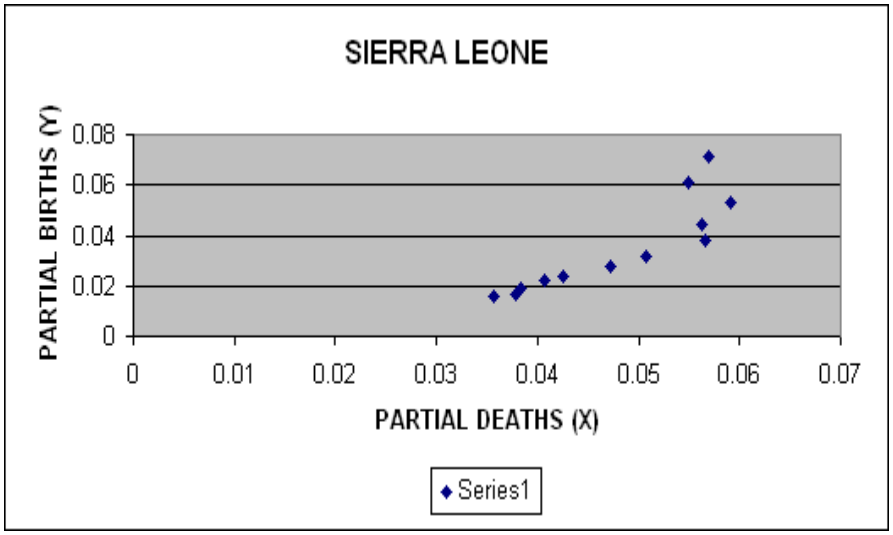


Table A1.2: Partial births and partial deaths, Eastern Region

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0356	0.0183
10 – 14 . . .	0.0356	0.0195
15 – 19 . . .	0.0358	0.0217
20 – 24 . . .	0.0396	0.0245
25 – 29 . . .	0.0436	0.0269
30 – 34 . . .	0.0505	0.0315
35 – 39 . . .	0.0540	0.0361
40 – 44 . . .	0.0599	0.0444
45 – 49 . . .	0.0579	0.0514
50 – 54 . . .	0.0618	0.0625
55 – 59 . . .	0.0538	0.0717
60 – 64 . . .	0.0544	0.0833

Fig. A1.2

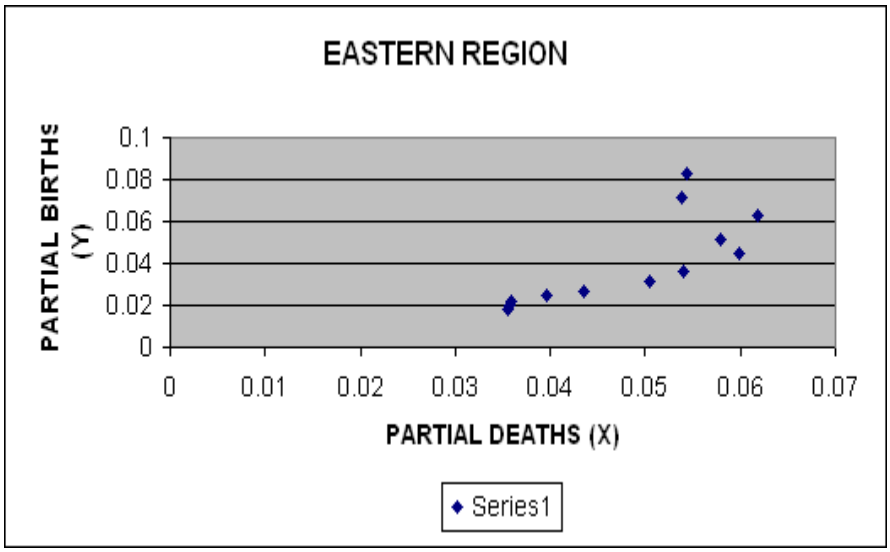


Table A1.3: Partial births and partial deaths, Northern Region

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0391	0.0146
10 – 14 . . .	0.0424	0.0163
15 – 19 . . .	0.0401	0.0186
20 – 24 . . .	0.0391	0.0212
25 – 29 . . .	0.0379	0.0226
30 – 34 . . .	0.0424	0.0253
35 – 39 . . .	0.0467	0.0284
40 – 44 . . .	0.0531	0.0336
45 – 49 . . .	0.0539	0.0380
50 – 54 . . .	0.0571	0.0446
55 – 59 . . .	0.0532	0.0498
60 – 64 . . .	0.0565	0.0573

Fig. A1.3

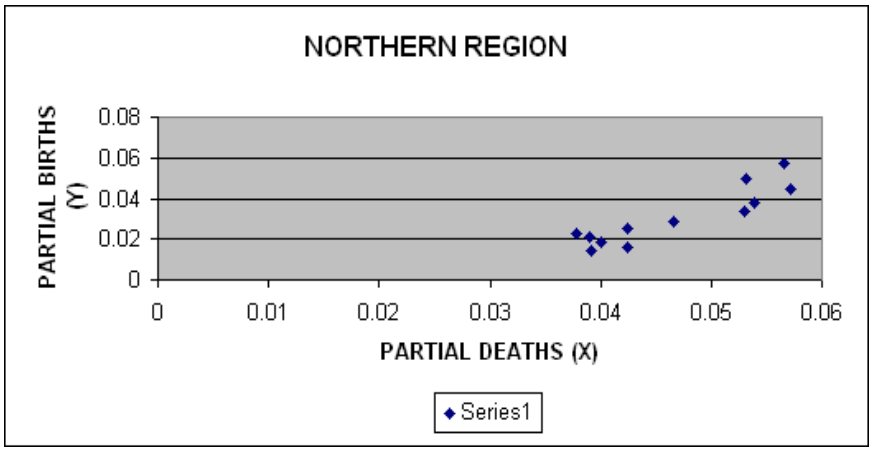


Table A1.4: Partial births and partial deaths, Southern Region

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0377	0.0180
10 – 14 . . .	0.0375	0.0194
15 – 19 . . .	0.0365	0.0218
20 – 24 . . .	0.0380	0.0249
25 – 29 . . .	0.0384	0.0271
30 – 34 . . .	0.0429	0.0311
35 – 39 . . .	0.0479	0.0356
40 – 44 . . .	0.0533	0.0427
45 – 49 . . .	0.0514	0.0494
50 – 54 . . .	0.0532	0.0592
55 – 59 . . .	0.0498	0.0682
60 – 64 . . .	0.0522	0.0797

FigA1.4

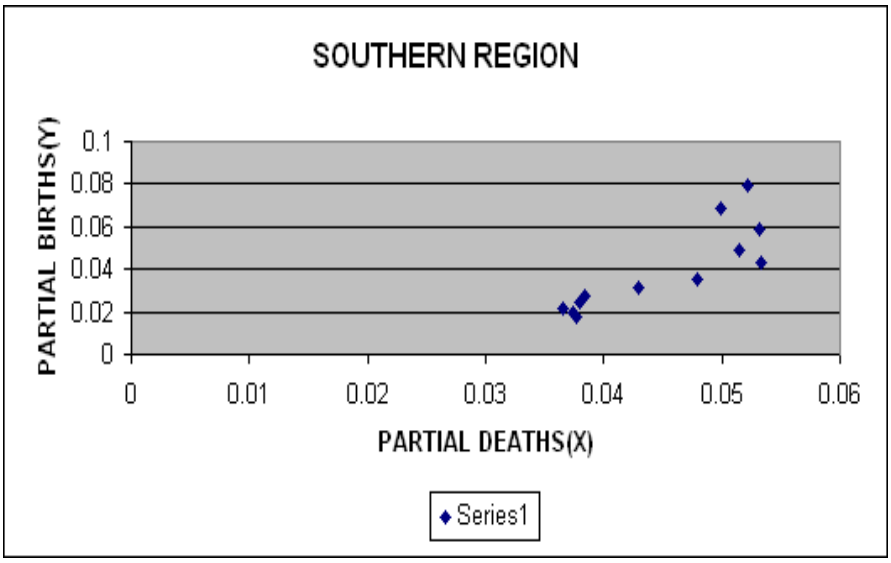


Table A1.5: Partial births and partial deaths, Western Region

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9....	0.0275	0.0113
10 – 14 . . .	0.0336	0.0121
15 – 19 . . .	0.0406	0.0140
20 – 24 . . .	0.0476	0.0165
25 – 29 . . .	0.0548	0.0190
30 – 34 . . .	0.0577	0.0229
35 – 39 . . .	0.0584	0.0270
40 – 44 . . .	0.0641	0.0328
45 – 49 . . .	0.0666	0.0401
50 – 54 . . .	0.0696	0.0493
55 – 59 . . .	0.0705	0.0604
60 – 64 . . .	0.0715	0.0732

Fig. A1.5

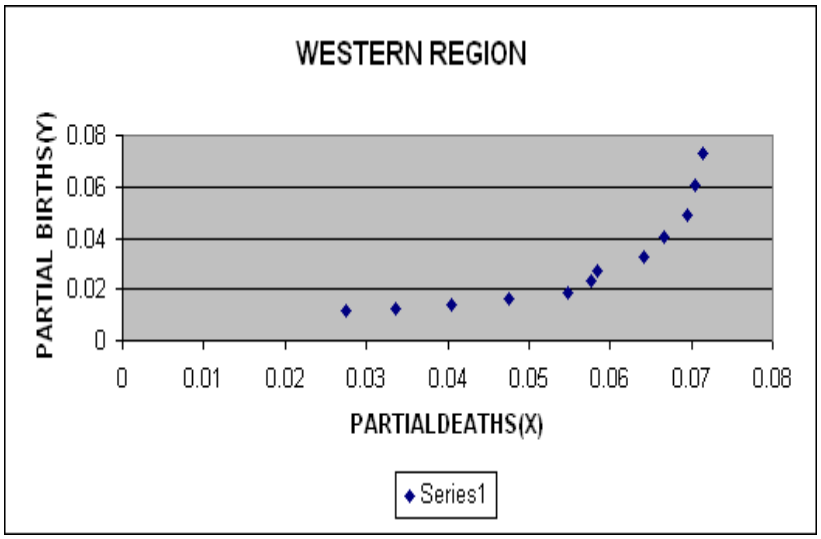


Table A1.6: Partial births and partial deaths, Kailahun District

POP. AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0381	0.0209
10 – 14 . . .	0.0392	0.0229
15 – 19 . . .	0.0388	0.0254
20 – 24 . . .	0.0427	0.0295
25 – 29 . . .	0.0417	0.0322
30 – 34 . . .	0.0476	0.0372
35 – 39 . . .	0.0517	0.0425
40 – 44 . . .	0.0564	0.0518
45 – 49 . . .	0.0540	0.0591
50 – 54 . . .	0.0576	0.0703
55 – 59 . . .	0.0490	0.0790
60 – 64 . . .	0.0496	0.0897

Fig.A1.6

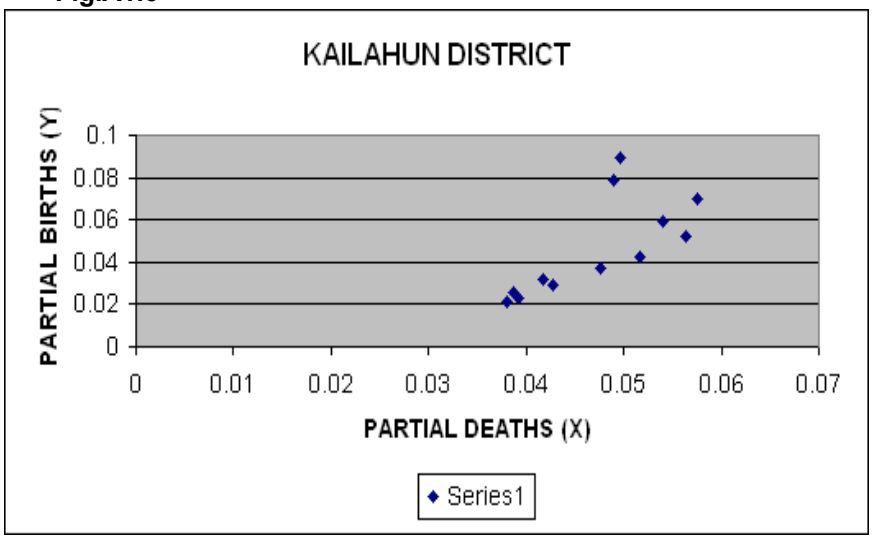


Table A1.7: Partial births and partial deaths, Kenema District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9…	0.0345	0.0186
10 – 14 . . .	0.0338	0.0199
15 – 19 . . .	0.0344	0.0221
20 – 24 . . .	0.0384	0.0246
25 – 29 . . .	0.0441	0.0272
30 – 34 . . .	0.0507	0.0319
35 – 39 . . .	0.0542	0.0365
40 – 44 . . .	0.0607	0.0451
45 – 49 . . .	0.0583	0.0528
50 – 54 . . .	0.0609	0.0647
55 – 59 . . .	0.0542	0.0751
60 – 64 . . .	0.0550	0.0883

Fig. A1.7

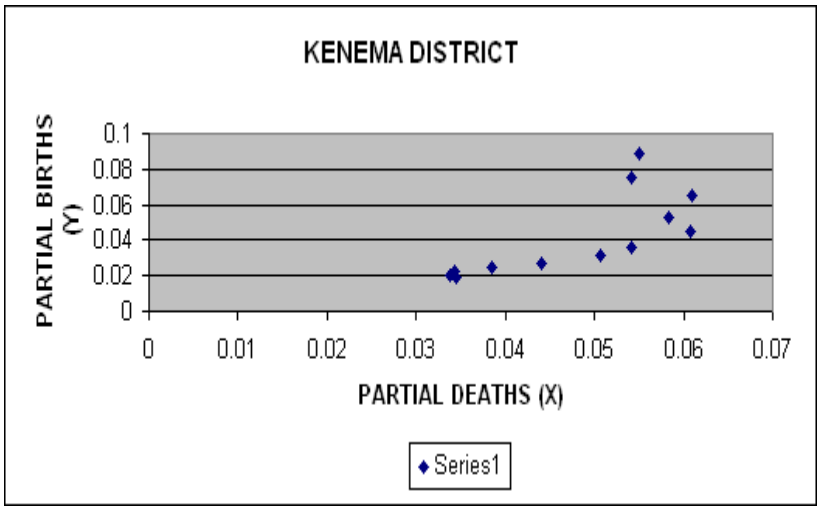


Table A1.8: Partial births and partial deaths, Kono District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9…	0.0347	0.0151
10 – 14 . . .	0.0347	0.0156
15 – 19 . . .	0.0350	0.0172
20 – 24 . . .	0.0384	0.0194
25 – 29 . . .	0.0447	0.0212
30 – 34 . . .	0.0530	0.0250
35 – 39 . . .	0.0559	0.0288
40 – 44 . . .	0.0625	0.0353
45 – 49 . . .	0.0617	0.0408
50 – 54 . . .	0.0682	0.0498
55 – 59 . . .	0.0589	0.0576
60 – 64 . . .	0.0595	0.0668

Fig. A1.8

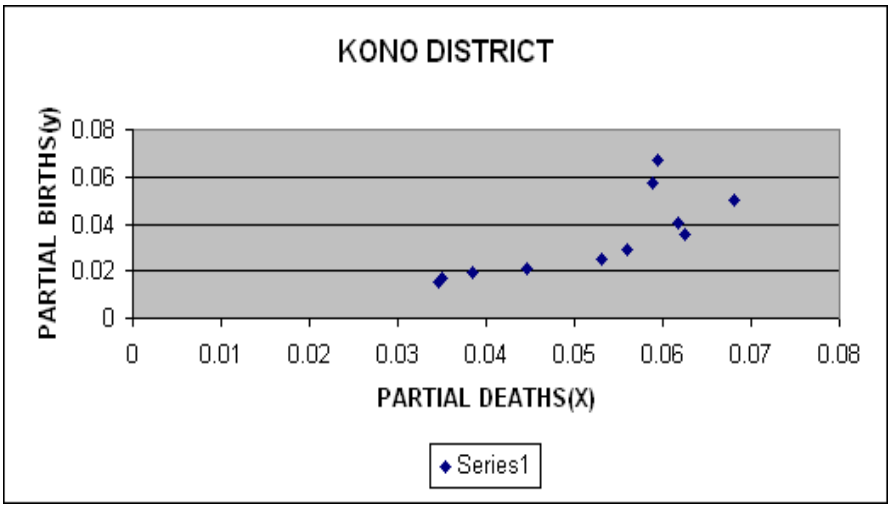


Table A1.9: Partial births and partial deaths, Bombali District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0368	0.0111
10 – 14 . . .	0.0413	0.0121
15 – 19 . . .	0.0411	0.0138
20 – 24 . . .	0.0405	0.0158
25 – 29 . . .	0.0382	0.0167
30 – 34 . . .	0.0413	0.0187
35 – 39 . . .	0.0450	0.0210
40 – 44 . . .	0.0514	0.0245
45 – 49 . . .	0.0543	0.0277
50 – 54 . . .	0.0586	0.0329
55 – 59 . . .	0.0538	0.0367
60 – 64 . . .	0.0576	0.0423

Fig. A1.9

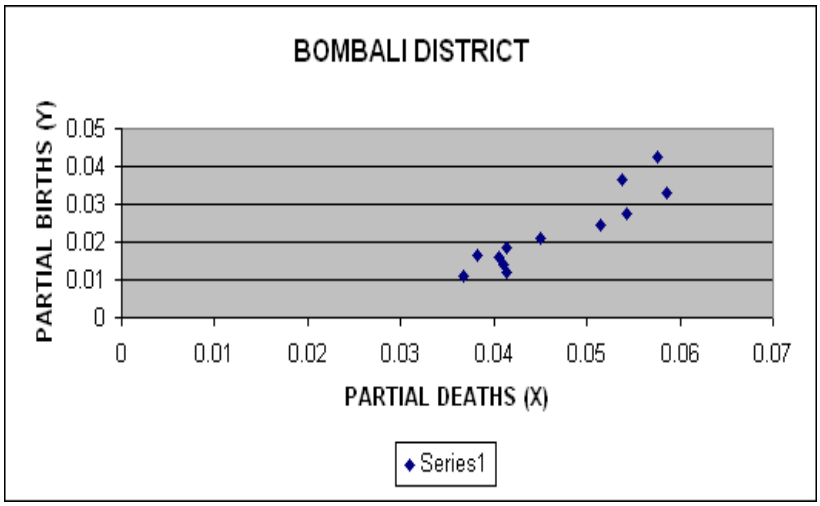


Table A1.10: Partial births and partial deaths, Kambia District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0428	0.0136
10 – 14 . . .	0.0450	0.0156
15 – 19 . . .	0.0382	0.0179
20 – 24 . . .	0.0372	0.0204
25 – 29 . . .	0.0374	0.0224
30 – 34 . . .	0.0426	0.0255
35 – 39 . . .	0.0468	0.0294
40 – 44 . . .	0.0515	0.0352
45 – 49 . . .	0.0501	0.0404
50 – 54 . . .	0.0514	0.0465
55 – 59 . . .	0.0493	0.0518
60 – 64 . . .	0.0531	0.0589

Fig.A1.10

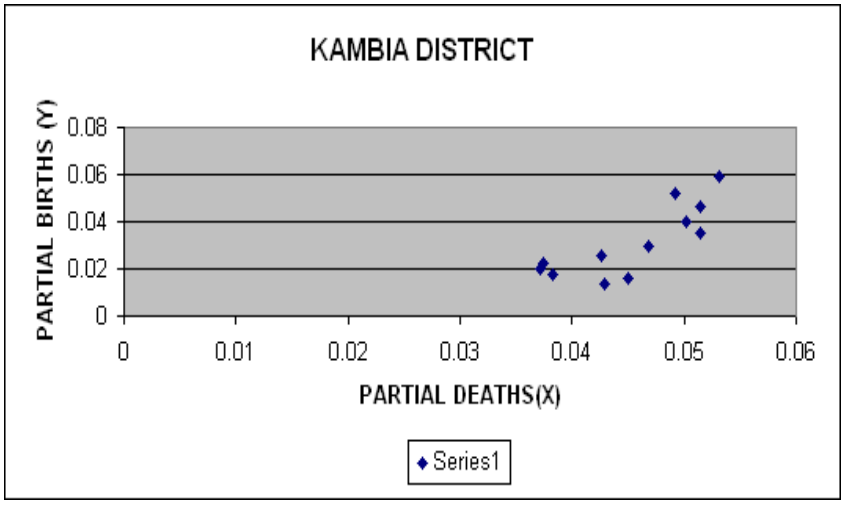


Table A1.11: Partial births and partial deaths, Koinadugu District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0382	0.0138
10 - 14 . . .	0.0443	0.0152
15 - 19 . . .	0.0413	0.0171
20 - 24 . . .	0.0393	0.0192
25 - 29 . . .	0.0376	0.0198
30 - 34 . . .	0.0435	0.0220
35 - 39 . . .	0.0476	0.0244
40 - 44 . . .	0.0550	0.0288
45 - 49 . . .	0.0590	0.0327
50 - 54 . . .	0.0623	0.0389
55 - 59 . . .	0.0582	0.0431
60 - 64 . . .	0.0597	0.0500

Fig. A1.11

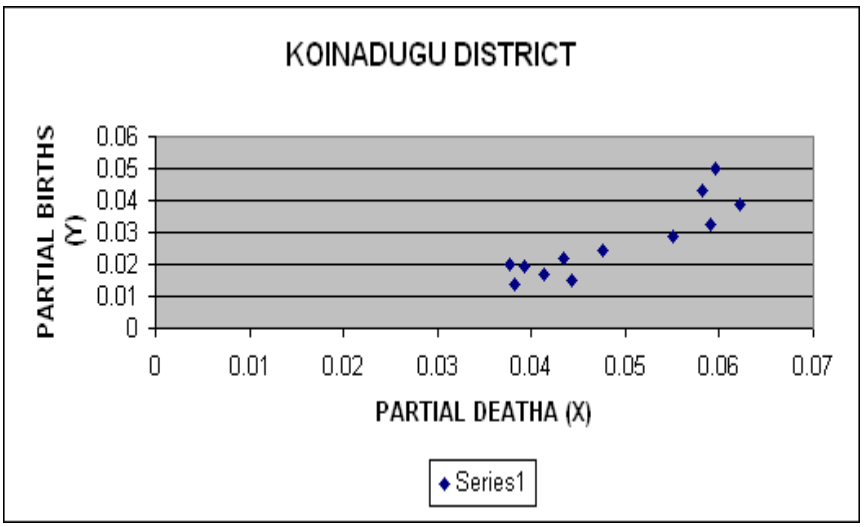


Table A1.12: Partial births and partial deaths, Port Loko District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0396	0.0171
10 - 14 . . .	0.0413	0.0196
15 - 19 . . .	0.0385	0.0225
20 - 24 . . .	0.0375	0.0254
25 - 29 . . .	0.0381	0.0276
30 - 34 . . .	0.0427	0.0310
35 - 39 . . .	0.0469	0.0350
40 - 44 . . .	0.0525	0.0412
45 - 49 . . .	0.0523	0.0466
50 - 54 . . .	0.0544	0.0544
55 - 59 . . .	0.0514	0.0607
60 - 64 . . .	0.0551	0.0700

Fig. A1.12

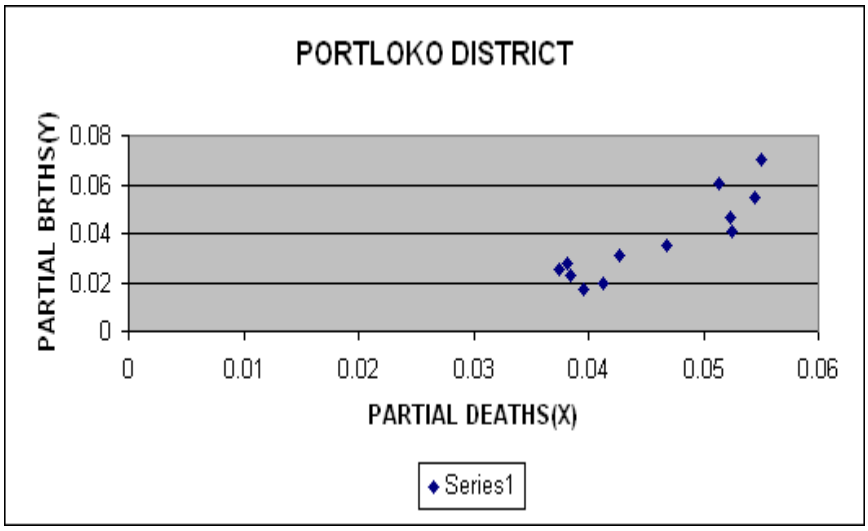


Table A1.13: Partial births and partial deaths, Tonkolili District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0391	0.0168
10 - 14 . . .	0.0418	0.0185
15 - 19 . . .	0.0416	0.0209
20 - 24 . . .	0.0407	0.0239
25 - 29 . . .	0.0377	0.0250
30 - 34 . . .	0.0423	0.0280
35 - 39 . . .	0.0475	0.0308
40 - 44 . . .	0.0557	0.0369
45 - 49 . . .	0.0547	0.0414
50 - 54 . . .	0.0599	0.0480
55 - 59 . . .	0.0547	0.0540
60 - 64 . . .	0.0580	0.0616

Fig. A1.13

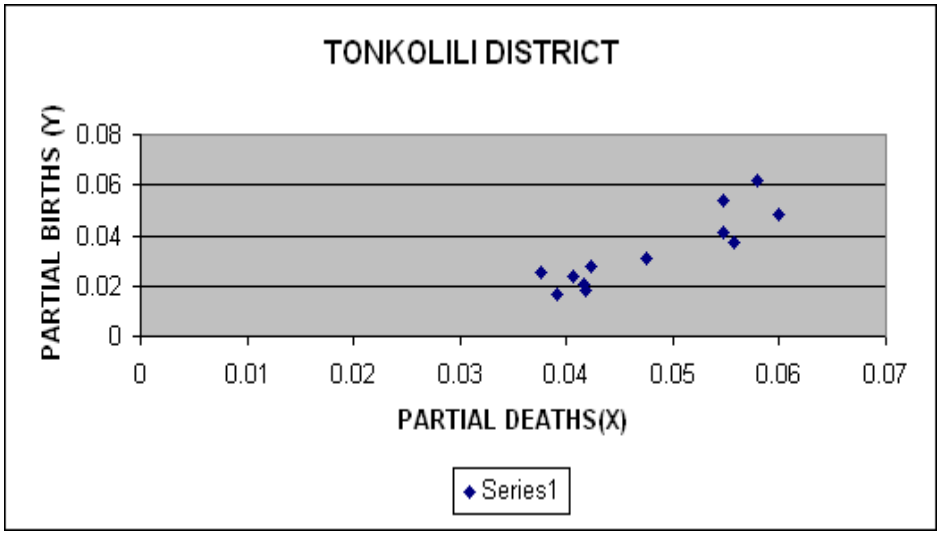


Table A1.14: Partial births and partial deaths, Bo District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9…	0.0345	0.0170
10 - 14 . . .	0.0362	0.0180
15 - 19 . . .	0.0387	0.0205
20 - 24 . . .	0.0415	0.0237
25 - 29 . . .	0.0425	0.0265
30 - 34 . . .	0.0465	0.0308
35 - 39 . . .	0.0507	0.0358
40 - 44 . . .	0.0560	0.0432
45 - 49 . . .	0.0543	0.0505
50 - 54 . . .	0.0563	0.0609
55 - 59 . . .	0.0519	0.0709
60 - 64 . . .	0.0529	0.0826

Fig. A1.14

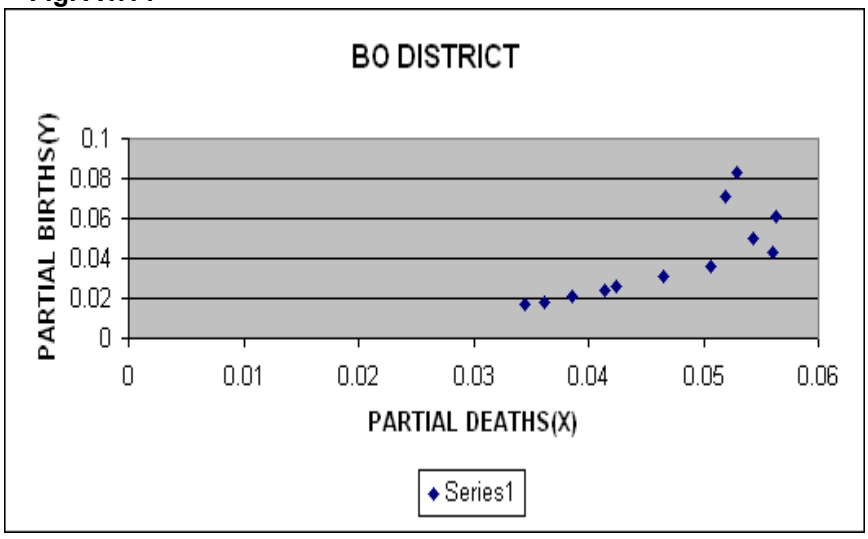


Table A1.15: Partial births and partial deaths, Bonthe District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0402	0.0164
10 - 14 . . .	0.0364	0.0178
15 - 19 . . .	0.0332	0.0199
20 - 24 . . .	0.0340	0.0223
25 - 29 . . .	0.0340	0.0237
30 - 34 . . .	0.0392	0.0268
35 - 39 . . .	0.0445	0.0296
40 - 44 . . .	0.0486	0.0356
45 - 49 . . .	0.0460	0.0404
50 - 54 . . .	0.0462	0.0473
55 - 59 . . .	0.0438	0.0539
60 - 64 . . .	0.0467	0.0618

Fig. A1.15

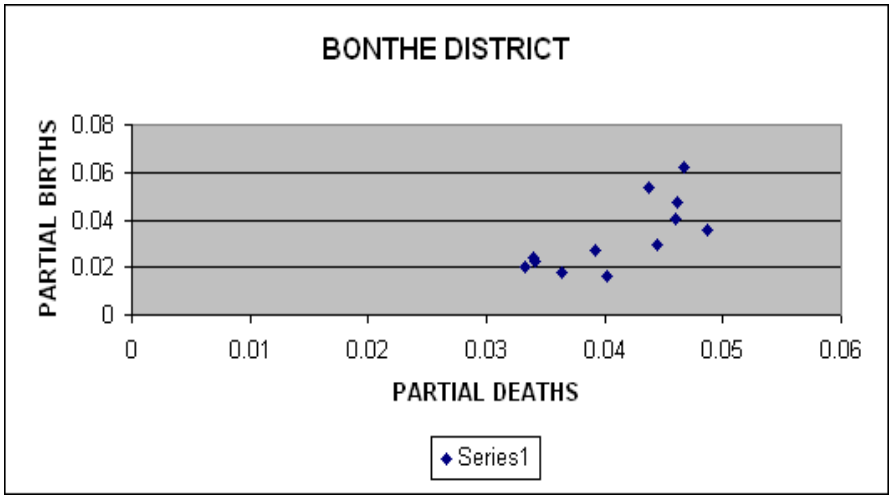


Table A1.16: Partial births and partial deaths, Moyamba District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0386	0.0158
10 - 14 . . .	0.0380	0.0171
15 - 19 . . .	0.0350	0.0194
20 - 24 . . .	0.0331	0.0217
25 - 29 . . .	0.0332	0.0229
30 - 34 . . .	0.0374	0.0255
35 - 39 . . .	0.0428	0.0289
40 - 44 . . .	0.0490	0.0339
45 - 49 . . .	0.0489	0.0388
50 - 54 . . .	0.0521	0.0465
55 - 59 . . .	0.0499	0.0529
60 - 64 . . .	0.0539	0.0625

Fig. A1.16

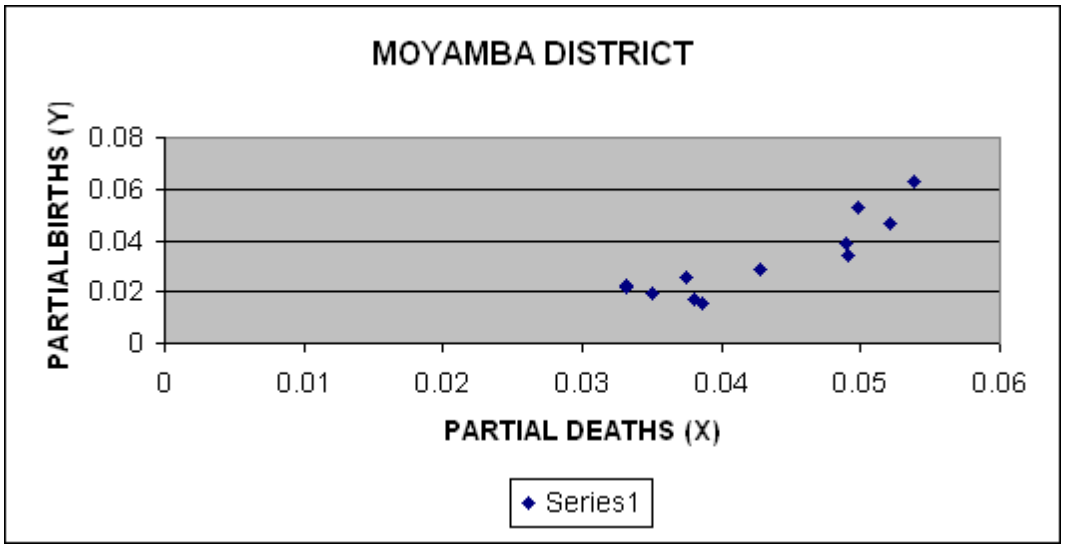


Table A1.17: Partial births and partial deaths, Pujehun District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9….	0.0414	0.0235
10 - 14 . . .	0.0402	0.0260
15 - 19 . . .	0.0357	0.0288
20 - 24 . . .	0.0391	0.0328
25 - 29 . . .	0.0393	0.0359
30 - 34 . . .	0.0453	0.0417
35 - 39 . . .	0.0516	0.0482
40 - 44 . . .	0.0570	0.0595
45 - 49 . . .	0.0533	0.0696
50 - 54 . . .	0.0541	0.0839
55 - 59 . . .	0.0506	0.0969
60 - 64 . . .	0.0533	0.1141

Fig. A1.17

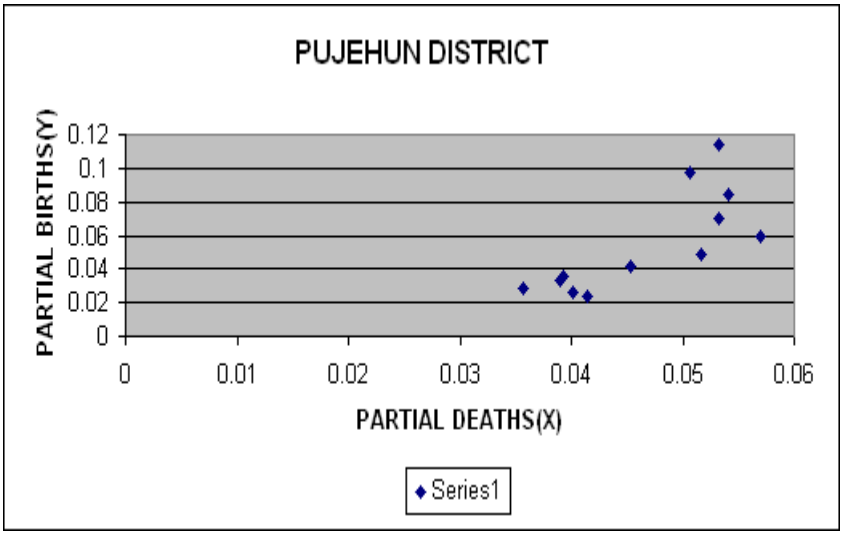


Table A1.18: Partial births and partial deaths, Western Rural District

POPULATION AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9.....	0.0335	0.0173
10 - 14 . . .	0.0365	0.0191
15 - 19 . . .	0.0387	0.0219
20 - 24 . . .	0.0412	0.0251
25 - 29 . . .	0.0466	0.0279
30 - 34 . . .	0.0522	0.0329
35 - 39 . . .	0.0561	0.0381
40 - 44 . . .	0.0637	0.0463
45 - 49 . . .	0.0655	0.0552
50 - 54 . . .	0.0674	0.0663
55 - 59 . . .	0.0655	0.0793
60 - 64 . . .	0.0662	0.0932

Fig. A1.18

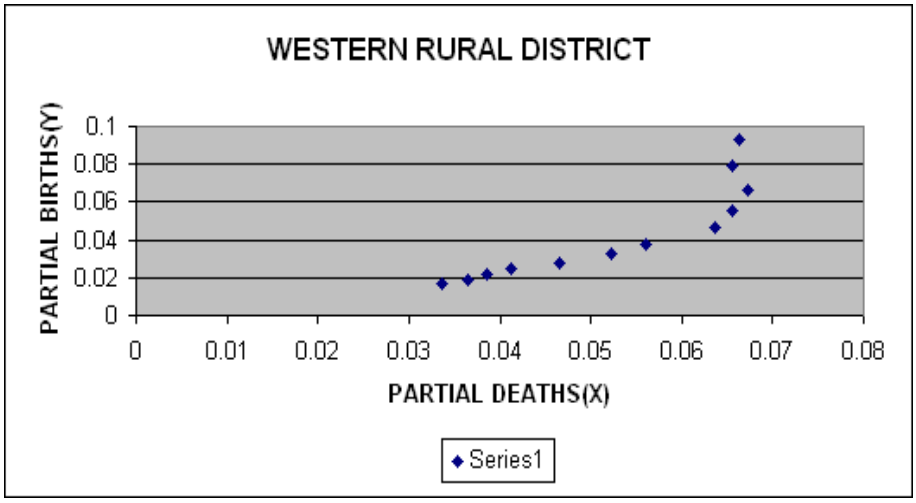
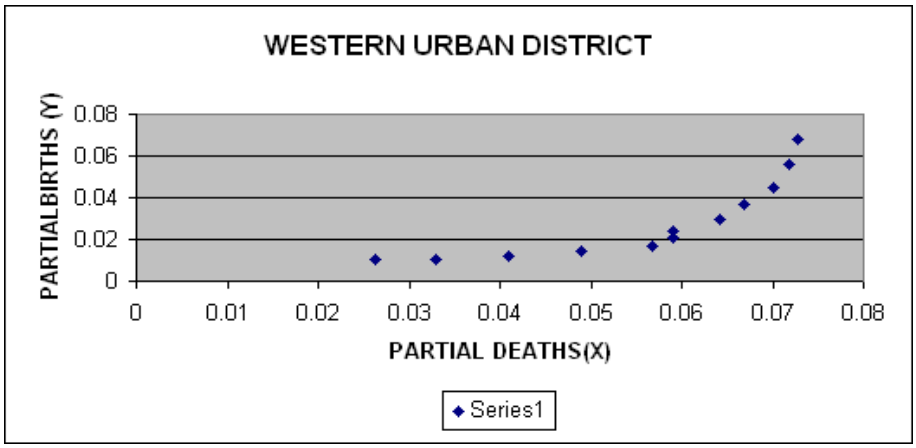


Table A1.19: Partial births and partial deaths, Western Urban District

POP. AGE GROUP	PARTIAL b+(Y)	PARTIAL d+(X)
5-9.....	0.0262	0.0100
10 - 14 . . .	0.0330	0.0107
15 - 19 . . .	0.0410	0.0123
20 - 24 . . .	0.0489	0.0146
25 - 29 . . .	0.0567	0.0170
30 - 34 . . .	0.0590	0.0206
35 - 39 . . .	0.0590	0.0243
40 - 44 . . .	0.0642	0.0296
45 - 49 . . .	0.0669	0.0365
50 - 54 . . .	0.0701	0.0451
55 - 59 . . .	0.0718	0.0557
60 - 64 . . .	0.0728	0.0680

Fig. A1.19



ANNEX 2: INFANT AND CHILD MORTALITY LEVELS

Table A2.1 Infant and child mortality levels: Sierra Leone

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1208	-0.12565	1.06
2	0.1971	0.013126	2.34
3	0.2034	-0.02725	4.17
5	0.2438	0.03573	6.32
10	0.2637	0.036341	8.69
15	0.2761	0.031155	11.31
20	0.2959	0.021615	14.47

Table A2.2 Infant and child mortality levels: Eastern Region

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1291	-0.0876	1.06
2	0.2159	0.070353	2.34
3	0.2226	0.030117	4.17
5	0.2692	0.102307	6.32
10	0.2893	0.100452	8.69
15	0.3022	0.094707	11.31
20	0.3180	0.07353	14.47

Table A2.3, Infant and child mortality levels: Northern Region

Age (X)	Probability q(x) For Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1072	-0.19272	1
2	0.1888	-0.0137	2.17
3	0.1994	-0.03985	3.97
5	0.2377	0.019064	6.09
10	0.2575	0.020296	8.44
15	0.2721	0.021083	11.03
20	0.2969	0.023962	14.12

Table A2.4 Infant and child mortality levels: Southern Region

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1447	-0.02134	1.06
2	0.2274	0.103722	2.34
3	0.2277	0.044571	4.17
5	0.2764	0.120302	6.32
10	0.2924	0.107888	8.69
15	0.3092	0.111284	11.31
20	0.3230	0.084981	14.47

Table A2.5 Infant and child mortality levels: Western Region

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.0906	-0.2863	1.67
2	0.1418	-0.1847	3.4
3	0.1447	-0.23304	5.42
5	0.1595	-0.22929	7.72
10	0.1806	-0.20636	10.22
15	0.1918	-0.20612	13.13
20	0.2106	-0.20553	16.64

Table A2.6 Infant and child mortality levels: Kailahun District

Age (X)	Probability q(x) for age X	α=Y(X)-βYs(X)	Time (T)
1	0.1145	-0.21659	1.06
2	0.1950	-0.10208	2.34
3	0.2115	-0.12147	4.17
5	0.2621	-0.06791	6.32
10	0.2739	-0.0977	8.69
15	0.2801	-0.1232	11.31
20	0.2899	-0.16401	14.47

Table A2.7 Infant and child mortality levels: Kenema District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1447	-0.02134	1.06
2	0.2336	0.121414	2.34
3	0.2358	0.067445	4.17
5	0.2835	0.137924	6.32
10	0.3078	0.144622	8.69
15	0.3223	0.141406	11.31
20	0.3400	0.1235	14.47

Table A2.8 Infant and child mortality levels: Kono District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1197	-0.13055	1.06
2	0.2086	0.048639	2.34
3	0.2135	0.003403	4.17
5	0.2540	0.06293	6.32
10	0.2780	0.072674	8.69
15	0.2972	0.082672	11.31
20	0.3190	0.075777	14.47

Table A2.9 Infant and child mortality levels: Bombali District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.0885	-0.29901	1.06
2	0.1617	-0.10775	2.34
3	0.1700	-0.13756	4.17
5	0.2042	-0.07852	6.32
10	0.2155	-0.09642	8.69
15	0.2379	-0.06896	11.31
20	0.2628	-0.06061	14.47

Table A2.10, Infant and child mortality levels: Kambia District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1041	-0.20922	1.06
2	0.181482	-0.03792	2.34
3	0.196328	-0.04938	4.17
5	0.241808	0.030161	6.32
10	0.259578	0.025745	8.69
15	0.28112	0.043704	11.31
20	0.308924	0.052502	14.47

Table A2.11, Infant and child mortality levels: Koinadugu District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1156	-0.15081	0.95
2	0.1909	-0.00687	2
3	0.1963	-0.04938	3.78
5	0.2428	0.032975	5.87
10	0.2637	0.036328	8.2
15	0.2811	0.043704	10.76
20	0.3059	0.045405	13.79

Table A2.12, Infant and child mortality levels: Port Loko District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1135	-0.16086	1.06
2	0.1961	0.009802	2.34
3	0.2004	-0.03665	4.17
5	0.2408	0.027489	6.32
10	0.2657	0.041606	8.69
15	0.2731	0.023618	11.31
20	0.2989	0.028794	14.47

Table A2.14, Infant and child mortality

Table A2.13, Infant and child mortality levels: Tonkolili District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1145	-0.21659	1
2	0.2107	-0.06336	2.17
3	0.2297	-0.08019	3.97
5	0.2611	-0.06983	6.09
10	0.2842	-0.07924	8.44
15	0.2962	-0.09526	11.03
20	0.3200	-0.11462	14.12

levels: Bo District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1468	-0.01313	1.06
2	0.2242	0.094809	2.34
3	0.2267	0.041679	4.17
5	0.2662	0.094648	6.32
10	0.2801	0.077841	8.69
15	0.2932	0.073121	11.31
20	0.3029	0.03832	14.47

Table A2.15, Infant and child mortality levels: Bonthe District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1353	-0.06035	1.06
2	0.2023	0.029499	2.34
3	0.2156	0.009444	4.17
5	0.2611	0.081523	6.32
10	0.2801	0.077841	8.69
15	0.3052	0.101814	11.31
20	0.3169	0.071165	14.47

Table A2.16, Infant and child mortality levels: Moyamba District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1301	-0.0829	1.06
2	0.2378	0.132924	2.34
3	0.2378	0.072924	4.17
5	0.2804	0.130411	6.32
10	0.3047	0.137374	8.69
15	0.3223	0.141406	11.31
20	0.3450	0.134633	14.47

Table A2.17 Infant and child mortality levels: Pujehun District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1582	0.031343	1
2	0.2326	0.118454	2.17
3	0.2257	0.038771	3.97
5	0.2967	0.169988	6.09
10	0.3047	0.137374	8.44
15	0.3263	0.150575	11.03
20	0.3320	0.105517	14.12

Table A2.18, Infant and child mortality levels: Western Rural District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.1114	-0.17152	1.2
2	0.1804	-0.04131	2.68
3	0.1953	-0.05266	4.58
5	0.2073	-0.06906	6.78
10	0.2339	-0.04327	9.18
15	0.2490	-0.03896	11.89
20	0.2738	-0.03252	15.18

Table A2.19 Infant and child mortality levels: Western Urban District

Age (X)	Probability q(x) for Age X	α=Y(X)-βYs(X)	Time (T)
1	0.0822	-0.3392	1.06
2	0.1304	-0.23359	2.34
3	0.1295	-0.29728	4.17
5	0.1453	-0.28438	6.32
10	0.1631	-0.26783	8.69
15	0.1757	-0.25966	11.31
20	0.1926	-0.26159	14.47

ANNEX 3 ADULT MORTALITY LEVELS

Table A3.1, Adult mortality levels: Sierra Leone

EXACT AGE(X)	PROBABILITY L(25+N)/L25=P(X)	α(β=1.0)	TIME (β=1.0)
35	0.9508	-0.4121	4.7016
40	0.9292	-0.4698	6.7846
45	0.9008	-0.4852	8.6611
50	0.8605	-0.4736	10.3029
55	0.8140	-0.4908	11.6209
60	0.7360	-0.4546	12.5543
65	0.6652	-0.5173	12.5236
70	0.5382	-0.5012	10.4630

Table A3.2, Adult mortality levels: Eastern Region

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9492	-0.392	4.704
40	0.9262	-0.443	6.791
45	0.8913	-0.425	8.699
50	0.8429	-0.390	10.394
55	0.7928	-0.411	11.761
60	0.7135	-0.387	12.752
65	0.6390	-0.449	12.805
70	0.5146	-0.445	10.824

Table A3.3, Adult mortality levels: Northern Region

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9444	-0.3331	4.7087
40	0.9216	-0.4039	6.7971
45	0.8962	-0.4558	8.6612
50	0.8525	-0.4352	10.3105
55	0.8071	-0.4645	11.6254
60	0.7139	-0.3881	12.6175
65	0.6511	-0.4807	12.4921
70	0.5096	-0.4334	10.2625

Table A3.4, Adult mortality levels: Southern Region

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9587	-0.5212	4.6875
40	0.9393	-0.5654	6.7529
45	0.9086	-0.5385	8.6246
50	0.8620	-0.4810	10.2730
55	0.8237	-0.5289	11.5403
60	0.7372	-0.4581	12.4776
65	0.6758	-0.5451	12.3494
70	0.5348	-0.4931	10.2464

Table A3.5, Adult mortality levels: Western Region

EXACT AGE(X)	PROBABILTY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9580	-0.51103	4.6917
40	0.9362	-0.5353	6.7725
45	0.9081	-0.53496	8.6438
50	0.8757	-0.55132	10.2446
55	0.8308	-0.5576	11.5249
60	0.7718	-0.56735	12.3457
65	0.6884	-0.57865	12.3738
70	0.5772	-0.59249	10.3792

Table A3.6, Adult mortality levels: Kailahun District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9393	-0.27503	4.7201
40	0.9186	-0.37903	6.8054
45	0.8837	-0.37874	8.7120
50	0.8426	-0.38914	10.3651
55	0.7959	-0.4224	11.6816
60	0.7252	-0.42175	12.5694
65	0.6496	-0.47678	12.5110
70	0.5246	-0.46898	10.1879

Table A3.7, Adult mortality levels: Kenema District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9573	-0.5004	4.6919
40	0.9328	-0.5024	6.7793
45	0.8973	-0.4628	8.6875
50	0.8467	-0.4081	10.3945
55	0.7949	-0.4188	11.7764
60	0.7159	-0.3938	12.7892
65	0.6416	-0.4561	12.8985
70	0.5204	-0.4590	11.1858

Table A3.8 Adult mortality levels: Kono District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9487	-0.3854	4.7042
40	0.9232	-0.4177	6.8005
45	0.8884	-0.4067	8.7151
50	0.8327	-0.3444	10.4544
55	0.7806	-0.3669	11.8682
60	0.6903	-0.3185	12.9819
65	0.6121	-0.3802	13.1590
70	0.4822	-0.3669	11.4216

Table A3.9 Adult mortality levels: Bombali District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9431	-0.3177	4.7134
40	0.9235	-0.4196	6.7956
45	0.9040	-0.5065	8.6364
50	0.8623	-0.4825	10.2717
55	0.8146	-0.4932	11.5848
60	0.7267	-0.4262	12.5380
65	0.6574	-0.4970	12.4100
70	0.5423	-0.5108	10.0014

Table A3.10 Adult mortality levels: Kambia District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9552	-0.4708	4.6936
40	0.9361	-0.5343	6.7622
45	0.9101	-0.5488	8.6198
50	0.8605	-0.4740	10.2773
55	0.8245	-0.5322	11.5293
60	0.7417	-0.4721	12.4391
65	0.6793	-0.5545	12.2969
70	0.5335	-0.4899	10.1265

Table A3.11 Adult mortality levels: Koinadugu District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9421	-0.3068	4.7194
40	0.9150	-0.3502	6.8099
45	0.8844	-0.3827	8.7072
50	0.8314	-0.3386	10.4205
55	0.7932	-0.4124	11.8057
60	0.6502	-0.2026	13.1297
65	0.6169	-0.3927	12.9906
70	0.4325	-0.2415	11.0478

Table A3.12 Adult mortality levels: Port Loko District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9500	-0.4020	4.6993
40	0.9265	-0.4458	6.7862
45	0.9014	-0.4895	8.6457
50	0.8592	-0.4674	10.2806
55	0.8166	-0.5010	11.5602
60	0.7381	-0.4609	12.4573
65	0.6665	-0.5208	12.3519
70	0.5321	-0.4868	10.0501

Table A3.13 Adult mortality levels: Tonkolili District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9370	-0.2499	4.7197
40	0.9106	-0.3158	6.8277
45	0.8860	-0.3926	8.7017
50	0.8484	-0.4157	10.3450
55	0.7985	-0.4321	11.6988
60	0.7080	-0.3706	12.6914
65	0.6514	-0.4813	12.5693
70	0.5054	-0.4232	10.3576

Table A3.14 Adult mortality levels: Bo District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9611	-0.5561	4.6839
40	0.9413	-0.5857	6.7509
45	0.9152	-0.5857	8.6039
50	0.8734	-0.5394	10.2334
55	0.8220	-0.5224	11.5397
60	0.7531	-0.5075	12.3794
65	0.6833	-0.5651	12.2559
70	0.5654	-0.5648	9.9687

Table A3.15 Adult mortality levels: Bonthe District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9623	-0.5761	4.6813
40	0.9435	-0.6096	6.7432
45	0.9188	-0.6122	8.5826
50	0.8867	-0.6113	10.1420
55	0.8593	-0.6816	11.3042
60	0.7841	-0.6079	12.1000
65	0.7162	-0.6540	11.8589
70	0.5987	-0.6430	9.3451

Table A3.16 Adult mortality levels: Moyamba District

EXACT AGE(X)	PROBABILITY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9574	-0.5022	4.6905
40	0.9352	-0.5249	6.7703
45	0.9067	-0.5248	8.6431
50	0.8614	-0.4782	10.2960
55	0.8249	-0.5337	11.5696
60	0.7390	-0.4637	12.5319
65	0.6771	-0.5485	12.4651
70	0.5389	-0.5028	10.5647

Table A3.17 Adult mortality levels: Pujehun District

EXACT AGE(X)	PROBABILTY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9370	-0.2499	4.6981
40	0.9106	-0.3158	6.7753
45	0.8860	-0.3926	8.6437
50	0.8484	-0.4157	10.2539
55	0.7985	-0.4321	11.4285
60	0.7080	-0.3706	12.2237
65	0.6514	-0.4813	11.7727
70	0.5054	-0.4232	9.2136

Table A3.18 Adult mortality levels: Western Rural District

EXACT AGE(X)	PROBABILTY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9599	-0.5377	4.6888
40	0.9359	-0.5323	6.7758
45	0.9063	-0.5226	8.6587
50	0.8584	-0.4637	10.3472
55	0.8013	-0.4424	11.7295
60	0.7415	-0.4713	12.6301
65	0.6480	-0.4725	12.8139
70	0.5527	-0.5352	10.8868

Table A3.19 Adult mortality levels: Western Urban District

EXACT AGE(X)	PROBABILTY L(25+N)/L25	α(β=1.0)	TIME (β=1.0)
35	0.9573	-0.5004	4.6929
40	0.9328	-0.5024	6.7727
45	0.8973	-0.4628	8.6426
50	0.8467	-0.4081	10.2298
55	0.7949	-0.4188	11.4907
60	0.7159	-0.3938	12.2964
65	0.6416	-0.4561	12.2951
70	0.5204	-0.4590	10.3185

ANNEX 4 CHILD AND ADULT MORTALITY LEVELS

Table A4.1 Child and Adult mortality levels: Sierra Leone

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.12565	4.701639	-0.41213
2.34	0.013126	6.784638	-0.46979
4.17	-0.02725	8.661123	-0.48524
6.32	0.03573	10.3029	-0.47356
8.69	0.036341	11.62088	-0.49083
11.31	0.031155	12.55427	-0.45456
14.47	0.021615	12.52358	-0.51728

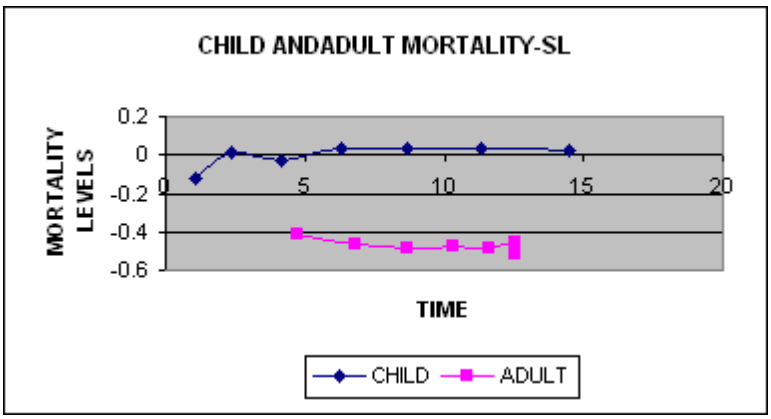


Table A4.2 Child and adult mortality levels: Eastern Region

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.0876	4.704036	-0.39153
2.34	0.0704	6.791045	-0.44345
4.17	0.0301	8.699124	-0.42482
6.32	0.1023	10.39375	-0.3905
8.69	0.1005	11.76079	-0.41112
11.31	0.0947	12.75209	-0.38673
14.47	0.0735	12.80464	-0.44926

Fig. A4.2

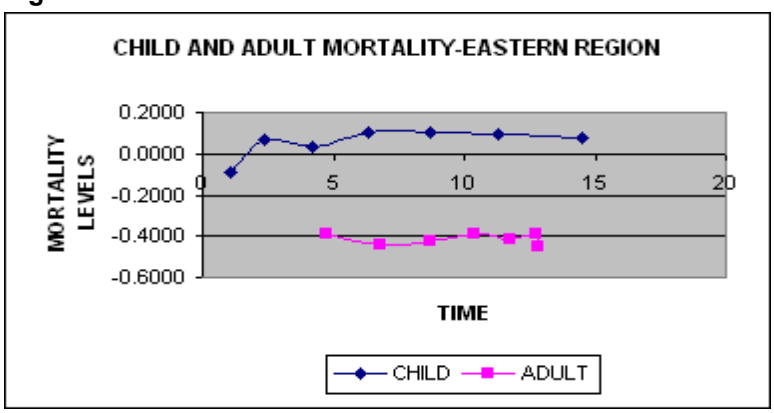


Table A4.3 Child and adult mortality levels: Northern Region

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1	-0.1927	4.7087	-0.3331
2.17	-0.0137	6.7971	-0.4039
3.97	-0.0399	8.6612	-0.4558
6.09	0.0191	10.3105	-0.4352
8.44	0.0203	11.6254	-0.4645
11.03	0.0211	12.6175	-0.3881
14.12	0.0240	12.4921	-0.4807

Fig. A4.3

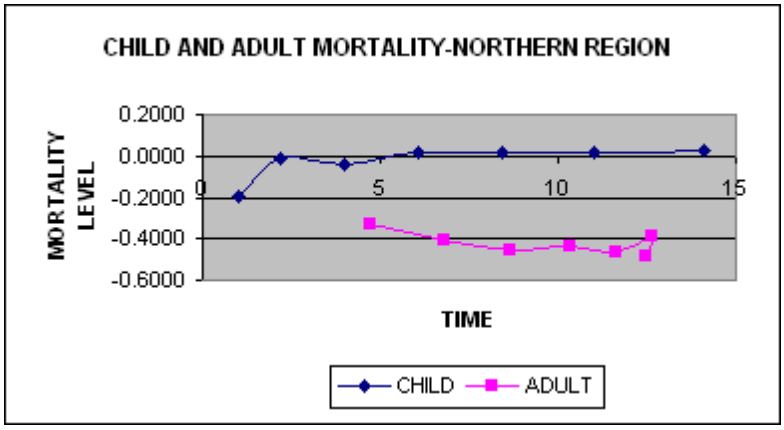


Table A4.4 Child and adult mortality levels: Southern Region

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.0213	4.68747	-0.52121
2.34	0.1037	6.752926	-0.56536
4.17	0.0446	8.624574	-0.5385
6.32	0.1203	10.27304	-0.48103
8.69	0.1079	11.54034	-0.52894
11.31	0.1113	12.47764	-0.45812
14.47	0.0850	12.34941	-0.54506

Fig. A4.4

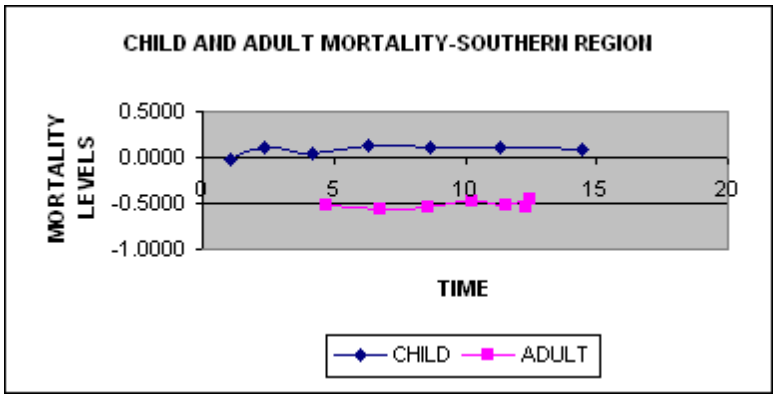


Table A4.5 Child and adult mortality levels: Western Region

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.67	-0.2863	4.6917	-0.51103
3.4	-0.1847	6.7725	-0.5353
5.42	-0.2330	8.6438	-0.53496
7.72	-0.2293	10.2446	-0.55132
10.22	-0.2064	11.5249	-0.5576
13.13	-0.2061	12.3457	-0.56735
16.64	-0.2055	12.3738	-0.57865

Fig. A4.5

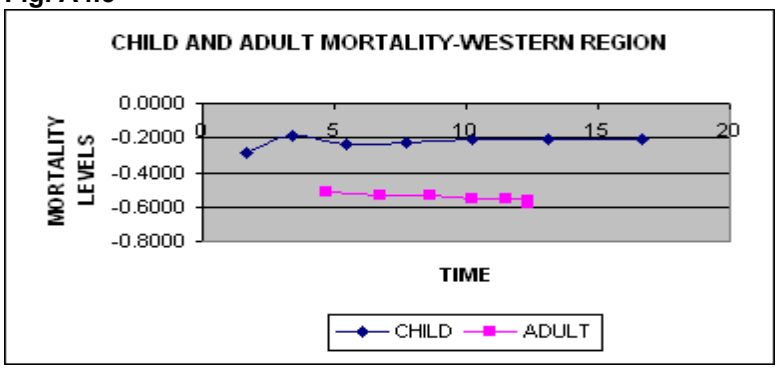


Table A4.6 Child and adult mortality levels: Western Urban District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.3392	4.6929	-0.5004
2.34	-0.2336	6.7727	-0.5024
4.17	-0.2973	8.6426	-0.4628
6.32	-0.2844	10.2298	-0.4081
8.69	-0.2678	11.4907	-0.4188
11.31	-0.2597	12.2964	-0.3938
14.47	-0.2616	12.2951	-0.4561

Fig. A4.6

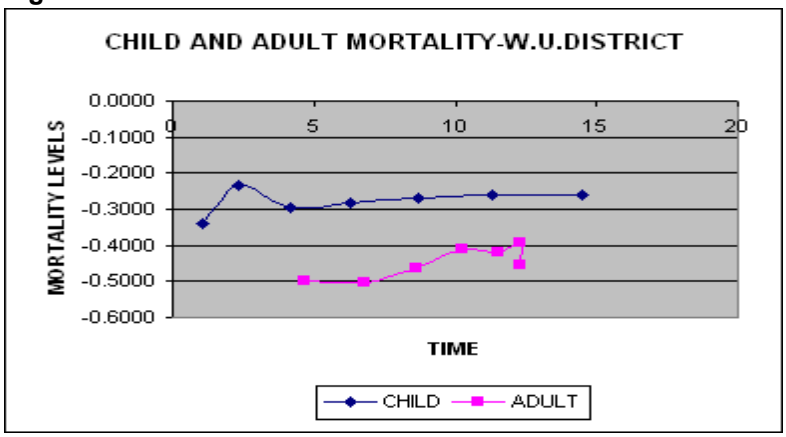


Table A4.7 Child and adult mortality levels: Western Rural District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.2	-0.1715	4.6888	-0.5377
2.68	-0.0413	6.7758	-0.5323
4.58	-0.0527	8.6587	-0.5226
6.78	-0.0691	10.3472	-0.4637
9.18	-0.0433	11.7295	-0.4424
11.89	-0.0390	12.6301	-0.4713
15.18	-0.0325	12.8139	-0.4725

Fig. A4.7

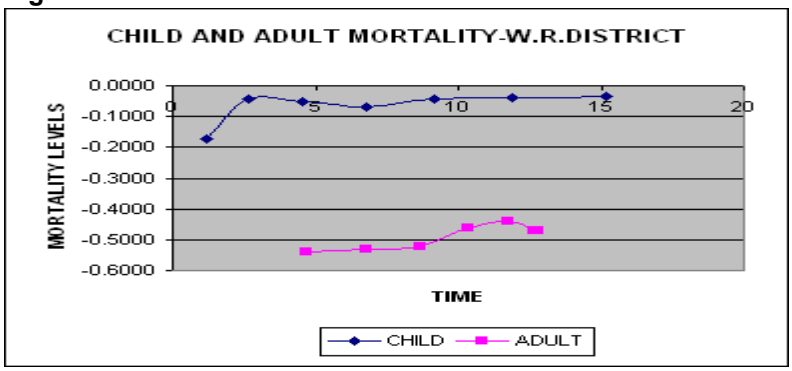


Table A4.8 Child and adult mortality levels: Bo District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.0131	4.6839	-0.5561
2.34	0.0948	6.7509	-0.5857
4.17	0.0417	8.6039	-0.5857
6.32	0.0946	10.2334	-0.5394
8.69	0.0778	11.5397	-0.5224
11.31	0.0731	12.3794	-0.5075
14.47	0.0383	12.2559	-0.5651

Fig. A4.8

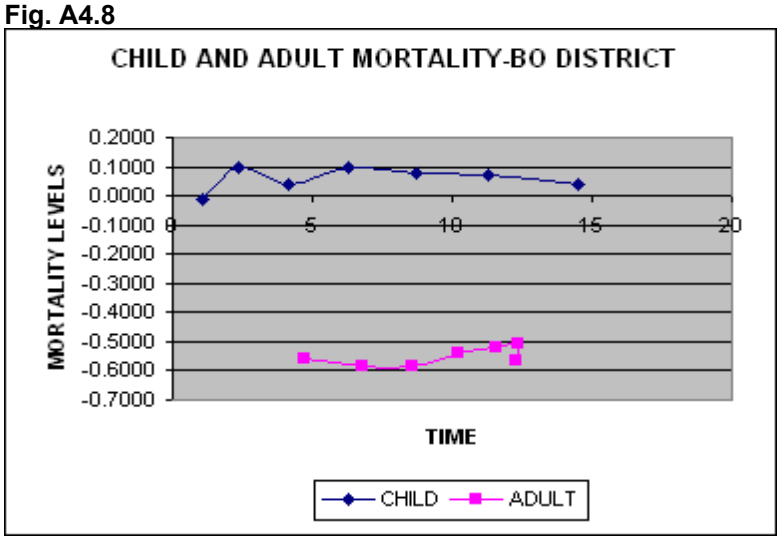


Table A4.9 Child and adult mortality levels: Bonthe District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.0603	4.6813	-0.5761
2.34	0.0295	6.7432	-0.6096
4.17	0.0094	8.5826	-0.6122
6.32	0.0815	10.1420	-0.6113
8.69	0.0778	11.3042	-0.6816
11.31	0.1018	12.1000	-0.6079
14.47	0.0712	11.8589	-0.6540

Fig.A4.9

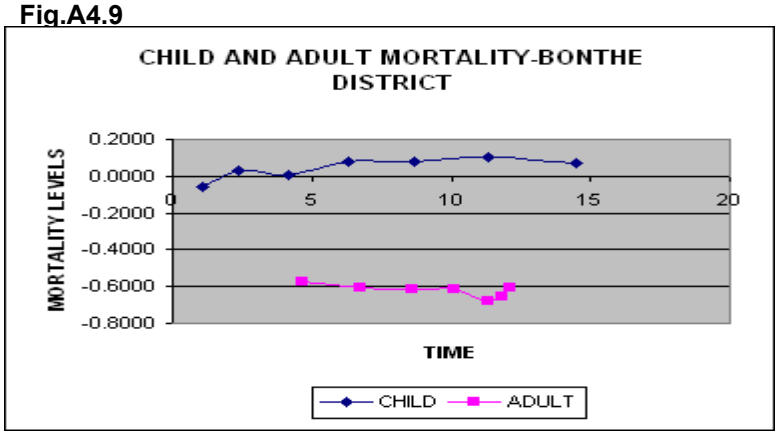


Table A4.10 Child and adult mortality levels: Moyamba District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.0829	4.6905	-0.5022
2.34	0.1329	6.7703	-0.5249
4.17	0.0729	8.6431	-0.5248
6.32	0.1304	10.2960	-0.4782
8.69	0.1374	11.5696	-0.5337
11.31	0.1414	12.5319	-0.4637
14.47	0.1346	12.4651	-0.5485

Fig. A4.10

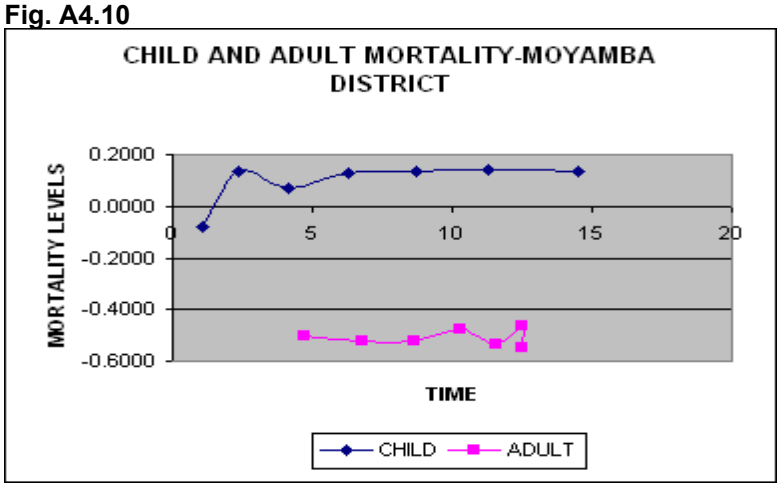


Table A4.11 Child and adult mortality levels: Pujehun District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1	0.0313	4.6981	-0.2499
2.17	0.1185	6.7753	-0.3158
3.97	0.0388	8.6437	-0.3926
6.09	0.1700	10.2539	-0.4157
8.44	0.1374	11.4285	-0.4321
11.03	0.1506	12.2237	-0.3706
14.12	0.1055	11.7727	-0.4813

Fig. A4.11

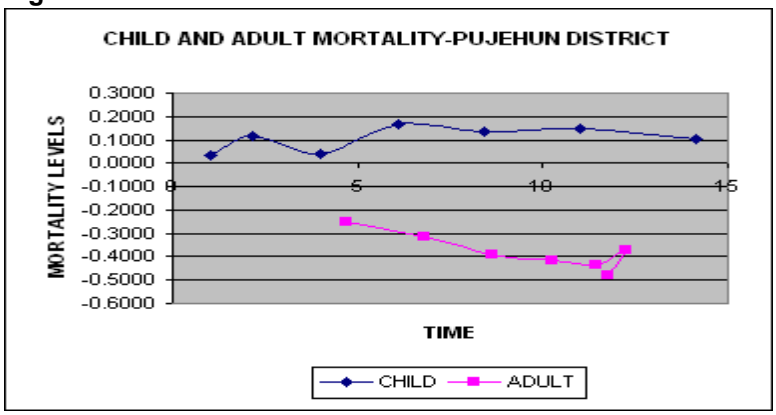


Table A4.12 Child and adult mortality levels: Bombali District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.2990	4.7134	-0.3177
2.34	-0.1078	6.7956	-0.4196
4.17	-0.1376	8.6364	-0.5065
6.32	-0.0785	10.2717	-0.4825
8.69	-0.0964	11.5848	-0.4932
11.31	-0.0690	12.5380	-0.4262
14.47	-0.0606	12.4100	-0.4970

Fig. A4.12

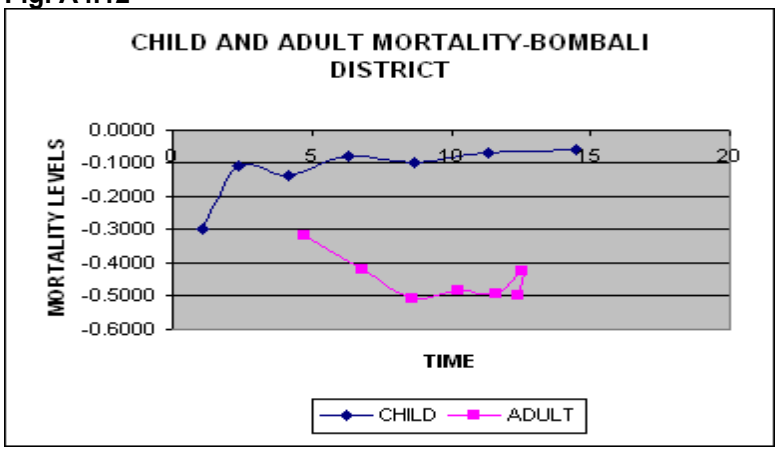


Table A4.13 Child and adult mortality levels: Kambia District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.2092	4.6936	-0.4708
2.34	-0.0379	6.7622	-0.5343
4.17	-0.0494	8.6198	-0.5488
6.32	0.0302	10.2773	-0.4740
8.69	0.0257	11.5293	-0.5322
11.31	0.0437	12.4391	-0.4721
14.47	0.0525	12.2969	-0.5545

Fig. A4.13

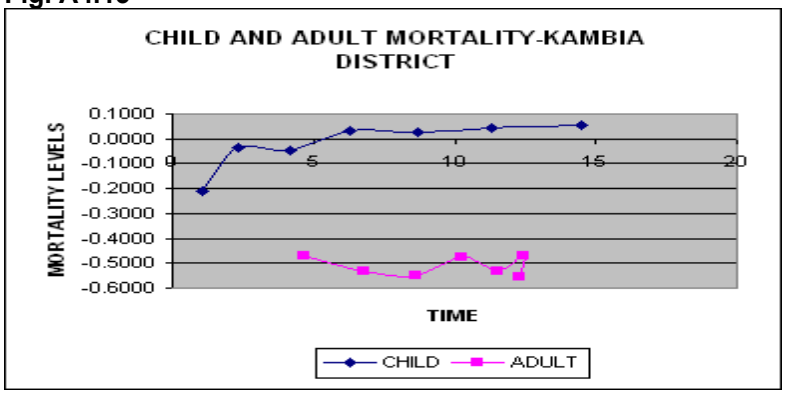


Table A4.14 Child and adult mortality levels: Koinadugu District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
0.95	-0.1508	4.7194	-0.3068
2	-0.0069	6.8099	-0.3502
3.78	-0.0494	8.7072	-0.3827
5.87	0.0330	10.4205	-0.3386
8.2	0.0363	11.8057	-0.4124
10.76	0.0437	13.1297	-0.2026
13.79	0.0454	12.9906	-0.3927

Fig. A4.14

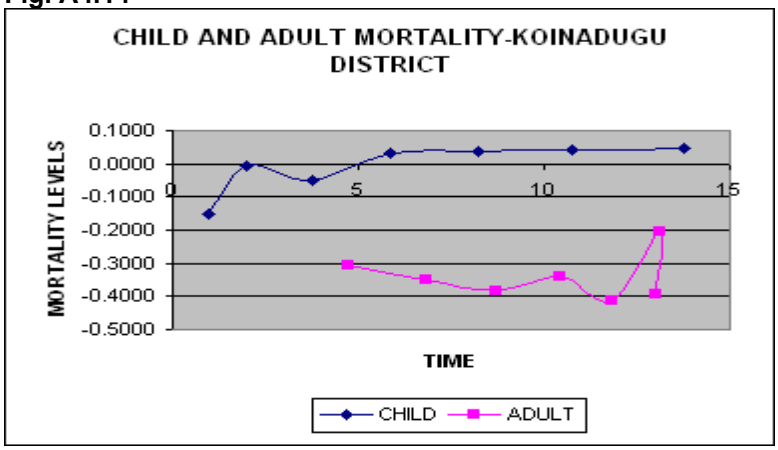


Table A4.15 Child and adult mortality levels: Port Loko District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.1609	4.6993	-0.4020
2.34	0.0098	6.7862	-0.4458
4.17	-0.0366	8.6457	-0.4895
6.32	0.0275	10.2806	-0.4674
8.69	0.0416	11.5602	-0.5010
11.31	0.0236	12.4573	-0.4609
14.47	0.0288	12.3519	-0.5208

Fig. A4.15

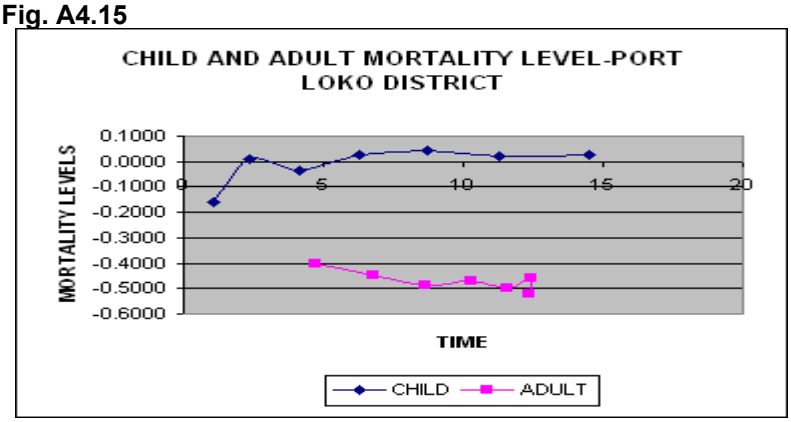


Table A4.16 Child and adult mortality levels: Tonkolili District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1	-0.2166	4.7197	-0.2499
2.17	-0.0634	6.8277	-0.3158
3.97	-0.0802	8.7017	-0.3926
6.09	-0.0698	10.3450	-0.4157
8.44	-0.0792	11.6988	-0.4321
11.03	-0.0953	12.6914	-0.3706
14.12	-0.1146	12.5693	-0.4813

Fig. A4.16

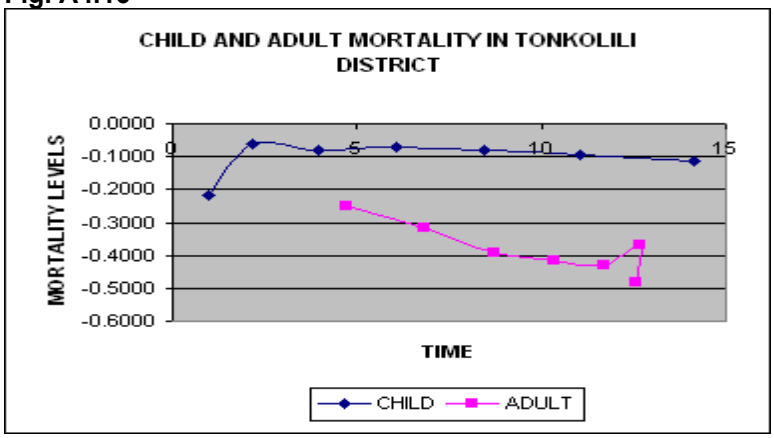


Table A4.17 Child and adult mortality levels: Kailahun District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.2166	4.7201	-0.27503
2.34	-0.1021	6.8054	-0.37903
4.17	-0.1215	8.7120	-0.37874
6.32	-0.0679	10.3651	-0.38914
8.69	-0.0977	11.6816	-0.4224
11.31	-0.1232	12.5694	-0.42175
14.47	-0.1640	12.5110	-0.47678

Fig. A4.17

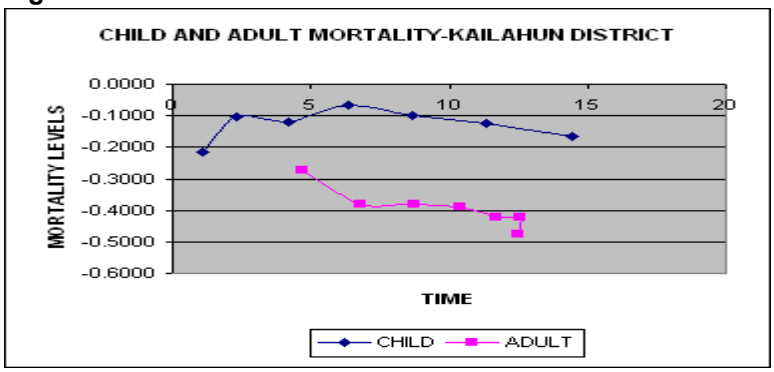


Fig.A4.18 Child and Adult Mortality – Kenema District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.0213	4.6919	-0.5004
2.34	0.1214	6.7793	-0.5024
4.17	0.0674	8.6875	-0.4628
6.32	0.1379	10.3945	-0.4081
8.69	0.1446	11.7764	-0.4188
11.31	0.1414	12.7892	-0.3938
14.47	0.1235	12.8985	-0.4561

Fig. A4.18

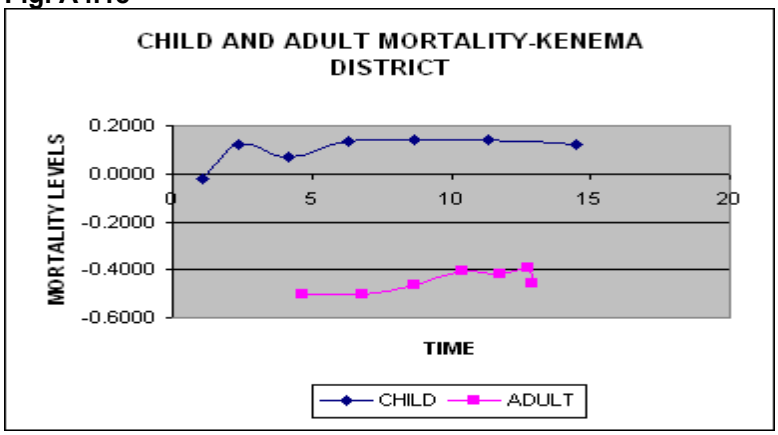
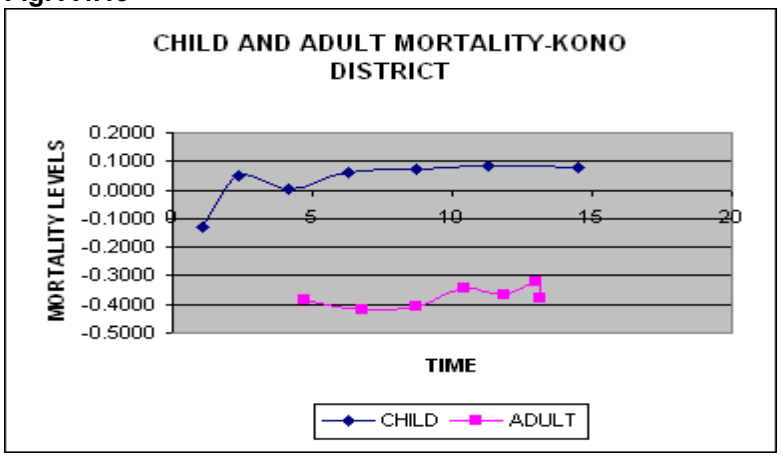


Table A4.19 Child and adult mortality levels: Kono District

TIME (T)	α (β= 1.0) CHILD	TIME (β=1.0)	α(β=1.0) ADULT
1.06	-0.1306	4.7042	-0.3854
2.34	0.0486	6.8005	-0.4177
4.17	0.0034	8.7151	-0.4067
6.32	0.0629	10.4544	-0.3444
8.69	0.0727	11.8682	-0.3669
11.31	0.0827	12.9819	-0.3185
14.47	0.0758	13.1590	-0.3802

Fig. A4.19



ANNEX 5: AGE SPECIFIC DEATH RATES

Table A5.1 Sierra Leone: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.107	0.114	0.099	0.015	0.015	0.014
01-04	0.034	0.036	0.032	0.005	0.006	0.005
05-09	0.009	0.010	0.009	0.003	0.003	0.003
10-14	0.005	0.006	0.005	0.004	0.003	0.004
15-19	0.007	0.007	0.007	0.004	0.004	0.005
20-24	0.013	0.010	0.015	0.005	0.005	0.005
25-29	0.009	0.010	0.009	0.005	0.005	0.005
30-34	0.012	0.013	0.011	0.006	0.006	0.006
35-39	0.011	0.012	0.011	0.007	0.007	0.007
40-44	0.017	0.019	0.016	0.009	0.010	0.009
45-49	0.017	0.018	0.016	0.010	0.011	0.010
50-54	0.027	0.031	0.023	0.014	0.016	0.013
55-59	0.024	0.026	0.022	0.016	0.017	0.015
60-64	0.044	0.053	0.037	0.022	0.025	0.020
65-69	0.040	0.043	0.037	0.025	0.027	0.023
70-74	0.063	0.074	0.053	0.034	0.038	0.031
75-79	0.065	0.069	0.061	0.045	0.048	0.043
80-84	0.103	0.118	0.090	0.055	0.059	0.052
85+	0.142	0.149	0.135	0.065	0.067	0.064

Table A5.2 Eastern Province: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.109	0.118	0.100	0.018	0.018	0.017
01-04	0.043	0.046	0.041	0.007	0.007	0.007
05-09	0.012	0.013	0.012	0.004	0.004	0.004
10-14	0.008	0.008	0.007	0.004	0.004	0.005
15-19	0.009	0.009	0.009	0.005	0.004	0.005
20-24	0.013	0.010	0.016	0.006	0.005	0.006
25-29	0.011	0.012	0.010	0.006	0.006	0.006
30-34	0.015	0.014	0.015	0.007	0.007	0.008
35-39	0.013	0.013	0.014	0.008	0.008	0.009
40-44	0.022	0.021	0.022	0.012	0.011	0.012
45-49	0.022	0.020	0.024	0.013	0.012	0.014
50-54	0.034	0.036	0.032	0.018	0.017	0.018
55-59	0.028	0.025	0.032	0.020	0.018	0.021
60-64	0.061	0.064	0.058	0.028	0.029	0.028
65-69	0.046	0.043	0.049	0.030	0.030	0.030
70-74	0.084	0.095	0.072	0.043	0.046	0.040
75-79	0.074	0.077	0.072	0.054	0.057	0.052
80-84	0.133	0.153	0.115	0.068	0.073	0.064
85+	0.166	0.172	0.159	0.076	0.077	0.075

Table A5.3 Kailahun District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.122	0.130	0.114	0.040	0.042	0.039
01-04	0.044	0.045	0.043	0.017	0.018	0.017
05-09	0.012	0.013	0.012	0.010	0.010	0.011
10-14	0.009	0.009	0.009	0.011	0.010	0.012
15-19	0.010	0.009	0.011	0.013	0.012	0.013
20-24	0.017	0.013	0.019	0.016	0.016	0.015
25-29	0.013	0.016	0.011	0.015	0.017	0.014
30-34	0.017	0.018	0.016	0.019	0.021	0.018
35-39	0.015	0.017	0.014	0.022	0.024	0.020
40-44	0.026	0.029	0.024	0.031	0.034	0.027
45-49	0.026	0.028	0.024	0.033	0.035	0.030
50-54	0.042	0.050	0.035	0.044	0.048	0.040
55-59	0.031	0.031	0.032	0.047	0.047	0.047
60-64	0.065	0.072	0.060	0.066	0.071	0.063
65-69	0.051	0.048	0.054	0.072	0.074	0.070
70-74	0.089	0.104	0.077	0.100	0.115	0.087
75-79	0.082	0.081	0.083	0.123	0.139	0.110
80-84	0.137	0.181	0.104	0.151	0.181	0.126
85+	0.167	0.181	0.151	0.167	0.181	0.151

Table A5.4 Kenema District: Age Specific Death Rates

Table A5.5 Kono District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.122	0.133	0.110	0.019	0.019	0.018
01-04	0.046	0.049	0.043	0.007	0.007	0.007
05-09	0.012	0.012	0.011	0.004	0.004	0.004
10-14	0.007	0.007	0.007	0.004	0.004	0.005
15-19	0.010	0.009	0.010	0.005	0.004	0.006
20-24	0.013	0.010	0.016	0.006	0.005	0.007
25-29	0.011	0.010	0.012	0.006	0.005	0.007
30-34	0.015	0.014	0.016	0.007	0.007	0.008
35-39	0.013	0.012	0.014	0.008	0.007	0.009
40-44	0.021	0.020	0.022	0.011	0.010	0.012
45-49	0.020	0.018	0.023	0.012	0.011	0.013
50-54	0.033	0.035	0.030	0.018	0.018	0.018
55-59	0.026	0.026	0.026	0.020	0.019	0.021
60-64	0.066	0.068	0.064	0.029	0.030	0.029
65-69	0.048	0.046	0.050	0.031	0.032	0.030
70-74	0.083	0.093	0.072	0.045	0.048	0.040
75-79	0.077	0.084	0.068	0.057	0.060	0.053
80-84	0.142	0.158	0.127	0.072	0.075	0.068
85+	0.172	0.180	0.162	0.079	0.080	0.077

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.077	0.083	0.072	0.015	0.016	0.014
01-04	0.038	0.042	0.034	0.007	0.007	0.006
05-09	0.013	0.014	0.012	0.004	0.004	0.003
10-14	0.006	0.007	0.005	0.004	0.004	0.003
15-19	0.007	0.008	0.006	0.004	0.004	0.004
20-24	0.010	0.008	0.012	0.005	0.004	0.005
25-29	0.009	0.011	0.008	0.005	0.005	0.005
30-34	0.011	0.011	0.011	0.006	0.006	0.007
35-39	0.012	0.011	0.012	0.007	0.007	0.009
40-44	0.018	0.017	0.020	0.010	0.009	0.012
45-49	0.019	0.016	0.024	0.011	0.009	0.015
50-54	0.028	0.026	0.031	0.015	0.013	0.018
55-59	0.028	0.020	0.041	0.017	0.015	0.020
60-64	0.049	0.050	0.047	0.024	0.024	0.024
65-69	0.038	0.034	0.042	0.026	0.025	0.026
70-74	0.077	0.088	0.067	0.037	0.037	0.036
75-79	0.061	0.061	0.062	0.046	0.043	0.049
80-84	0.107	0.105	0.109	0.058	0.054	0.063
85+	0.149	0.138	0.163	0.068	0.062	0.077

Table A5.6 Northern Province: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.054	0.059	0.049	0.010	0.010	0.010
01-04	0.026	0.028	0.024	0.005	0.005	0.004
05-09	0.007	0.008	0.007	0.003	0.003	0.003
10-14	0.005	0.005	0.005	0.003	0.004	0.004
15-19	0.007	0.007	0.006	0.004	0.005	0.004
20-24	0.012	0.014	0.017	0.005	0.006	0.005
25-29	0.009	0.011	0.007	0.004	0.005	0.004
30-34	0.011	0.013	0.009	0.005	0.006	0.005
35-39	0.009	0.011	0.007	0.006	0.007	0.005
40-44	0.015	0.018	0.013	0.008	0.009	0.007
45-49	0.015	0.016	0.014	0.009	0.010	0.007
50-54	0.024	0.030	0.020	0.011	0.013	0.009
55-59	0.018	0.021	0.014	0.012	0.014	0.010
60-64	0.033	0.043	0.025	0.016	0.019	0.014
65-69	0.029	0.030	0.027	0.018	0.019	0.016
70-74	0.046	0.056	0.038	0.024	0.026	0.022
75-79	0.042	0.046	0.039	0.029	0.031	0.028
80-84	0.069	0.074	0.064	0.036	0.037	0.035
85+	0.090	0.095	0.085	0.041	0.042	0.040

Table A5.7 Bombali District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.047	0.048	0.045	0.009	0.009	0.009
01-04	0.023	0.025	0.022	0.004	0.004	0.004
05-09	0.007	0.007	0.006	0.002	0.002	0.003
10-14	0.004	0.004	0.004	0.003	0.002	0.003
15-19	0.006	0.005	0.006	0.004	0.003	0.004
20-24	0.011	0.007	0.015	0.004	0.004	0.004
25-29	0.008	0.009	0.007	0.004	0.004	0.003
30-34	0.009	0.011	0.007	0.005	0.005	0.004
35-39	0.009	0.011	0.008	0.005	0.006	0.005
40-44	0.014	0.016	0.012	0.007	0.008	0.006
45-49	0.013	0.014	0.011	0.008	0.009	0.006
50-54	0.021	0.024	0.018	0.010	0.012	0.008
55-59	0.017	0.023	0.012	0.011	0.014	0.009
60-64	0.030	0.039	0.023	0.015	0.018	0.013
65-69	0.029	0.033	0.025	0.016	0.018	0.015
70-74	0.039	0.047	0.033	0.021	0.021	0.021
75-79	0.038	0.040	0.035	0.028	0.026	0.030
80-84	0.066	0.056	0.075	0.035	0.031	0.041
85+	0.091	0.085	0.099	0.042	0.038	0.047

Table A5.8 Kambia District: Age Specific Death Rates

Table A5.9 Koinadugu District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.046	0.052	0.041	0.009	0.009	0.009
01-04	0.025	0.026	0.023	0.004	0.004	0.004
05-09	0.006	0.006	0.007	0.003	0.003	0.003
10-14	0.005	0.005	0.005	0.003	0.003	0.003
15-19	0.006	0.007	0.006	0.004	0.004	0.004
20-24	0.009	0.008	0.011	0.004	0.004	0.004
25-29	0.009	0.011	0.008	0.004	0.005	0.004
30-34	0.009	0.010	0.009	0.005	0.006	0.005
35-39	0.010	0.010	0.009	0.007	0.007	0.006
40-44	0.017	0.019	0.014	0.010	0.011	0.008
45-49	0.019	0.020	0.018	0.011	0.012	0.010
50-54	0.028	0.037	0.021	0.014	0.016	0.012
55-59	0.024	0.026	0.022	0.015	0.017	0.013
60-64	0.039	0.050	0.032	0.019	0.023	0.016
65-69	0.034	0.040	0.029	0.021	0.024	0.018
70-74	0.055	0.070	0.043	0.030	0.034	0.026
75-79	0.051	0.054	0.047	0.038	0.040	0.036
80-84	0.100	0.121	0.082	0.049	0.052	0.046
85+	0.115	0.112	0.118	0.053	0.050	0.056

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.068	0.076	0.060	0.012	0.012	0.012
01-04	0.031	0.031	0.031	0.005	0.006	0.005
05-09	0.009	0.009	0.008	0.004	0.004	0.003
10-14	0.006	0.007	0.006	0.004	0.005	0.005
15-19	0.008	0.009	0.007	0.005	0.007	0.006
20-24	0.014	0.026	0.028	0.006	0.008	0.006
25-29	0.010	0.014	0.008	0.005	0.006	0.004
30-34	0.013	0.016	0.011	0.006	0.007	0.005
35-39	0.009	0.013	0.007	0.006	0.007	0.005
40-44	0.017	0.020	0.015	0.009	0.010	0.008
45-49	0.014	0.015	0.013	0.009	0.010	0.008
50-54	0.029	0.034	0.025	0.012	0.014	0.010
55-59	0.017	0.020	0.014	0.013	0.014	0.012
60-64	0.040	0.048	0.031	0.019	0.020	0.019
65-69	0.034	0.029	0.040	0.022	0.021	0.022
70-74	0.058	0.063	0.053	0.027	0.028	0.025
75-79	0.056	0.060	0.051	0.031	0.033	0.029
80-84	0.060	0.065	0.055	0.034	0.036	0.031
85+	0.093	0.101	0.081	0.042	0.045	0.038

Table A5.10 Port Loko District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.033	0.036	0.030	0.007	0.007	0.007
01-04	0.016	0.016	0.016	0.003	0.003	0.003
05-09	0.006	0.006	0.005	0.002	0.002	0.002
10-14	0.004	0.004	0.004	0.003	0.003	0.003
15-19	0.005	0.006	0.005	0.003	0.004	0.003
20-24	0.008	0.015	0.015	0.003	0.005	0.004
25-29	0.006	0.008	0.005	0.003	0.004	0.002
30-34	0.008	0.009	0.007	0.004	0.004	0.003
35-39	0.005	0.007	0.004	0.004	0.004	0.003
40-44	0.011	0.013	0.009	0.006	0.006	0.005
45-49	0.009	0.010	0.008	0.005	0.006	0.004
50-54	0.018	0.023	0.014	0.007	0.009	0.005
55-59	0.009	0.011	0.007	0.007	0.008	0.006
60-64	0.023	0.033	0.016	0.010	0.012	0.009
65-69	0.016	0.016	0.016	0.010	0.012	0.009
70-74	0.031	0.037	0.026	0.013	0.015	0.011
75-79	0.024	0.029	0.018	0.014	0.017	0.011
80-84	0.031	0.037	0.026	0.016	0.019	0.013
85+	0.039	0.048	0.030	0.018	0.021	0.014

Table A5.11 Tonkolili District Age: Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.086	0.095	0.078	0.015	0.016	0.013
01-04	0.039	0.044	0.034	0.007	0.007	0.006
05-09	0.010	0.011	0.009	0.004	0.004	0.004
10-14	0.007	0.008	0.007	0.005	0.005	0.005
15-19	0.009	0.008	0.009	0.006	0.006	0.005
20-24	0.018	0.019	0.017	0.007	0.009	0.006
25-29	0.013	0.017	0.010	0.006	0.008	0.005
30-34	0.016	0.021	0.012	0.007	0.009	0.006
35-39	0.013	0.017	0.010	0.008	0.009	0.008
40-44	0.021	0.024	0.018	0.011	0.012	0.010
45-49	0.022	0.023	0.022	0.012	0.013	0.011
50-54	0.030	0.037	0.024	0.014	0.017	0.012
55-59	0.027	0.030	0.023	0.016	0.017	0.014
60-64	0.038	0.048	0.031	0.021	0.024	0.018
65-69	0.039	0.041	0.037	0.024	0.026	0.022
70-74	0.061	0.076	0.048	0.033	0.036	0.031
75-79	0.059	0.060	0.059	0.044	0.046	0.042
80-84	0.106	0.114	0.099	0.057	0.061	0.052
85+	0.144	0.164	0.121	0.066	0.073	0.057

Table A5.12 Southern Province: Age Specific Death Rates

Table A5.13 Bo District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.132	0.142	0.122	0.018	0.019	0.018
01-04	0.042	0.044	0.039	0.007	0.007	0.007
05-09	0.012	0.012	0.011	0.004	0.004	0.004
10-14	0.006	0.006	0.006	0.004	0.003	0.004
15-19	0.008	0.007	0.008	0.005	0.004	0.005
20-24	0.013	0.010	0.016	0.005	0.005	0.006
25-29	0.010	0.010	0.010	0.005	0.005	0.005
30-34	0.013	0.013	0.012	0.007	0.007	0.006
35-39	0.013	0.013	0.012	0.007	0.008	0.007
40-44	0.019	0.020	0.018	0.010	0.010	0.009
45-49	0.017	0.018	0.016	0.010	0.011	0.010
50-54	0.029	0.033	0.026	0.015	0.016	0.013
55-59	0.022	0.023	0.021	0.017	0.019	0.015
60-64	0.050	0.063	0.041	0.025	0.029	0.022
65-69	0.044	0.052	0.038	0.028	0.031	0.026
70-74	0.070	0.080	0.061	0.040	0.044	0.036
75-79	0.075	0.083	0.067	0.054	0.059	0.050
80-84	0.123	0.148	0.105	0.068	0.075	0.063
85+	0.178	0.191	0.166	0.082	0.086	0.079

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.149	0.135	0.109	0.020	0.018	0.016
01-04	0.047	0.041	0.036	0.007	0.006	0.006
05-09	0.012	0.011	0.010	0.003	0.003	0.003
10-14	0.005	0.005	0.005	0.003	0.003	0.004
15-19	0.007	0.007	0.008	0.004	0.004	0.005
20-24	0.010	0.013	0.014	0.005	0.005	0.006
25-29	0.010	0.010	0.009	0.005	0.005	0.005
30-34	0.012	0.011	0.014	0.007	0.006	0.006
35-39	0.014	0.012	0.008	0.008	0.007	0.006
40-44	0.019	0.019	0.017	0.010	0.009	0.008
45-49	0.018	0.019	0.013	0.011	0.010	0.008
50-54	0.032	0.026	0.023	0.017	0.013	0.011
55-59	0.026	0.026	0.016	0.020	0.015	0.013
60-64	0.059	0.039	0.035	0.031	0.020	0.018
65-69	0.053	0.038	0.034	0.034	0.024	0.021
70-74	0.096	0.057	0.048	0.049	0.034	0.030
75-79	0.081	0.071	0.054	0.063	0.050	0.042
80-84	0.156	0.106	0.098	0.083	0.062	0.054
85+	0.211	0.182	0.136	0.097	0.081	0.064

Table A5.14 Bonthe District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.109	0.117	0.101	0.016	0.015	0.016
01-04	0.036	0.036	0.035	0.006	0.005	0.006
05-09	0.010	0.010	0.011	0.003	0.003	0.004
10-14	0.005	0.004	0.006	0.004	0.003	0.005
15-19	0.008	0.006	0.009	0.004	0.003	0.005
20-24	0.014	0.008	0.018	0.006	0.004	0.006
25-29	0.009	0.008	0.009	0.005	0.004	0.005
30-34	0.014	0.014	0.014	0.006	0.006	0.006
35-39	0.008	0.008	0.009	0.006	0.005	0.006
40-44	0.017	0.017	0.017	0.008	0.007	0.008
45-49	0.013	0.012	0.014	0.008	0.007	0.008
50-54	0.023	0.020	0.025	0.011	0.011	0.010
55-59	0.016	0.018	0.014	0.012	0.015	0.010
60-64	0.035	0.046	0.026	0.018	0.020	0.016
65-69	0.034	0.043	0.028	0.020	0.022	0.019
70-74	0.048	0.046	0.049	0.029	0.030	0.029
75-79	0.054	0.057	0.051	0.041	0.043	0.040
80-84	0.098	0.110	0.089	0.053	0.056	0.051
85+	0.136	0.143	0.130	0.062	0.064	0.061

Table A5.15, Moyamba District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.091	0.099	0.083	0.014	0.015	0.013
01-04	0.033	0.035	0.030	0.005	0.006	0.005
05-09	0.010	0.011	0.008	0.003	0.003	0.003
10-14	0.005	0.005	0.005	0.004	0.003	0.004
15-19	0.007	0.006	0.008	0.005	0.004	0.005
20-24	0.015	0.010	0.018	0.005	0.005	0.005
25-29	0.010	0.012	0.009	0.005	0.005	0.004
30-34	0.009	0.011	0.007	0.005	0.006	0.005
35-39	0.011	0.012	0.010	0.006	0.006	0.006
40-44	0.015	0.016	0.014	0.008	0.008	0.007
45-49	0.013	0.015	0.012	0.008	0.009	0.007
50-54	0.024	0.028	0.021	0.011	0.013	0.010
55-59	0.016	0.018	0.014	0.014	0.016	0.012
60-64	0.039	0.050	0.033	0.021	0.024	0.019
65-69	0.041	0.048	0.035	0.025	0.028	0.023
70-74	0.060	0.062	0.058	0.032	0.037	0.029
75-79	0.067	0.079	0.056	0.042	0.046	0.039
80-84	0.088	0.113	0.071	0.049	0.053	0.047
85+	0.132	0.123	0.138	0.060	0.055	0.065

Table A5.16, Pujehun District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.185	0.205	0.164	0.023	0.024	0.022
01-04	0.051	0.056	0.045	0.009	0.009	0.008
05-09	0.014	0.014	0.013	0.005	0.005	0.005
10-14	0.010	0.009	0.010	0.006	0.005	0.006
15-19	0.011	0.011	0.011	0.006	0.005	0.007
20-24	0.016	0.012	0.020	0.007	0.006	0.008
25-29	0.012	0.012	0.013	0.007	0.007	0.007
30-34	0.017	0.017	0.017	0.009	0.009	0.008
35-39	0.015	0.017	0.014	0.009	0.011	0.008
40-44	0.026	0.028	0.023	0.013	0.015	0.011
45-49	0.023	0.028	0.017	0.014	0.015	0.012
50-54	0.042	0.051	0.033	0.021	0.023	0.019
55-59	0.027	0.026	0.029	0.023	0.024	0.022
60-64	0.082	0.103	0.068	0.035	0.038	0.032
65-69	0.057	0.061	0.053	0.038	0.039	0.036
70-74	0.092	0.098	0.086	0.056	0.059	0.053
75-79	0.105	0.113	0.096	0.078	0.084	0.072
80-84	0.186	0.206	0.169	0.099	0.108	0.091
85+	0.250	0.281	0.217	0.115	0.126	0.103

Table A5.17, Western Area: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.182	0.189	0.175	0.015	0.016	0.014
01-04	0.028	0.031	0.026	0.004	0.004	0.004
05-09	0.006	0.007	0.006	0.002	0.002	0.002
10-14	0.003	0.004	0.003	0.002	0.002	0.002
15-19	0.004	0.004	0.004	0.003	0.002	0.003
20-24	0.009	0.006	0.011	0.004	0.003	0.004
25-29	0.007	0.007	0.008	0.004	0.004	0.004
30-34	0.010	0.010	0.009	0.005	0.005	0.005
35-39	0.011	0.011	0.011	0.006	0.006	0.006
40-44	0.014	0.016	0.012	0.008	0.008	0.007
45-49	0.016	0.017	0.015	0.010	0.011	0.009
50-54	0.021	0.024	0.018	0.014	0.015	0.012
55-59	0.033	0.037	0.029	0.019	0.021	0.016
60-64	0.039	0.045	0.035	0.023	0.027	0.020
65-69	0.052	0.064	0.042	0.031	0.036	0.026
70-74	0.063	0.079	0.050	0.039	0.047	0.034
75-79	0.091	0.103	0.083	0.056	0.066	0.050
80-84	0.111	0.148	0.091	0.064	0.079	0.056
85+	0.175	0.211	0.153	0.080	0.094	0.072

Table A5.18, Western Rural District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.617	0.634	0.599	0.030	0.030	0.029
01-04	0.050	0.051	0.049	0.006	0.007	0.006
05-09	0.009	0.010	0.008	0.003	0.004	0.003
10-14	0.006	0.007	0.005	0.004	0.004	0.004
15-19	0.008	0.009	0.007	0.005	0.004	0.005
20-24	0.013	0.009	0.016	0.006	0.005	0.006
25-29	0.011	0.011	0.012	0.006	0.006	0.007
30-34	0.016	0.019	0.012	0.008	0.008	0.008
35-39	0.016	0.013	0.019	0.010	0.010	0.009
40-44	0.023	0.025	0.020	0.012	0.014	0.011
45-49	0.027	0.032	0.020	0.015	0.018	0.012
50-54	0.033	0.034	0.032	0.019	0.023	0.015
55-59	0.041	0.055	0.025	0.023	0.030	0.016
60-64	0.055	0.073	0.040	0.029	0.037	0.023
65-69	0.056	0.074	0.041	0.038	0.043	0.032
70-74	0.085	0.108	0.068	0.053	0.064	0.045
75-79	0.114	0.112	0.117	0.078	0.093	0.068
80-84	0.160	0.246	0.111	0.095	0.127	0.076
85+	0.270	0.328	0.233	0.124	0.147	0.110

Table A5.19, Western Urban District: Age Specific Death Rates

Age Group	Crude ASDR			Adjusted death rates		
	Total	Male	Female	Adj Total	Male	Female
<1	0.052	0.054	0.050	0.009	0.009	0.008
01-04	0.022	0.025	0.020	0.003	0.004	0.003
05-09	0.006	0.007	0.005	0.002	0.002	0.002
10-14	0.003	0.003	0.002	0.002	0.002	0.002
15-19	0.003	0.003	0.003	0.003	0.002	0.003
20-24	0.008	0.006	0.010	0.004	0.003	0.004
25-29	0.007	0.006	0.007	0.004	0.004	0.004
30-34	0.009	0.009	0.009	0.005	0.005	0.004
35-39	0.010	0.011	0.010	0.005	0.006	0.005
40-44	0.012	0.013	0.010	0.007	0.007	0.006
45-49	0.014	0.014	0.014	0.009	0.010	0.009
50-54	0.019	0.022	0.015	0.013	0.013	0.012
55-59	0.032	0.033	0.030	0.018	0.019	0.016
60-64	0.036	0.038	0.033	0.022	0.025	0.019
65-69	0.051	0.061	0.042	0.029	0.034	0.025
70-74	0.057	0.071	0.045	0.036	0.043	0.031
75-79	0.085	0.100	0.074	0.049	0.058	0.045
80-84	0.098	0.122	0.085	0.056	0.066	0.050
85+	0.149	0.178	0.132	0.068	0.080	0.062

R E F E R E N C E S

Acsádi, György, and J. Nemeskéri. 1970. History of Human Life Span and Mortality. Budapest: Akadémiai KiadÓ.

Arriage, Edardo E. 1968. New Life Tables for Latin American Population in the Nineteenth and Twentieth Centuries. Population Monograph Series No. 3. Berkeley: Institute of International Studies, University of California.

Arthur, W.B. and Stoto, M.A. (1983). An Analysis of Indirect Mortality Estimation. Population Studies 37,2.

Blacker, J.G.C. (1973). Population Growth in The Gambia: An Analytical Report of the 1973 Census of the Gambia.

Blacker, J.G.C. (1977). The Estimation of Adult Mortality in Africa from Data on Orphan hood. Population Studies, 31, 107-128.

Blacker, J.G.C., Hill, A.G., and Timaeus, I. (1985). Age Patterns of Mortality in Africa: An Examination of Recent Evidence, in International Population conference, Florence, 1985. Liege: International Union for the Scientific Study of Population.

Blacker, J.G.C., Mukiza-Gapere, J. (1988). The indirect Measurement of Adult Mortality in Africa, in African Population Conference. Daka, 1988. Liege: International Union for the scientific Study of Population.

Bourgeois-Pichat, Jean. 1962. Factor Analysis and Sex-Age-specific Death Rates: A Contribution to the Study of the Dimensions of Mortality. United Nations. Population Bulletin No. 6, pp. 147-201.

Bras, William. 1971a. The Analysis of Maternity Histories to Detect Changes in Fertility. United Nation Document No. E/CN.9/AC.12/R11. Budapest: United Nations.

____. 1971b. Disciplining Demographic Data. International Population Conference, London, 1969, v. 1, pp. 183-204. Liege: International Union for the Scientific Study of Population.

____. 1971c. A Critique of Methods for estimating Population Growth in Countries with Limited Data. Proceedings of the 38th Session of the International Statistical Institute, Washington, 1971. Bulletin of the international Statistical Institute, Book 1, v. 44, pp. 397-412.

____. 1971d On the Scale of Mortality. In Biological Aspect of Demography, ed. by William Brass, pp. 69-110. London: Taylor and Francis, Ltd.

____. 1971e. Tablas para Convertir las Proporciones de Niňos con Madres Actualmente Vivas en Probabilidades de Sobreviviencia de una Table de Vida. Serie Ds No. 4. San José: Centro Latinoamericano de Demografia.

____. 1972. Mortality Estimation by Indirect Means. Working paper for UNESOB Expert Group Meeting on Mortality. Beirut, 1972. Unpublished. (Abridged version published in Population bulleting of the United Nations Economic and Social Office in Beirut, no. 4 [January 1973], pp. 9-19.)

____. 1974. The Estimation of Fertility and Mortality from Defective Vital Registration Records. Working paper for UNESOB Meeting. Unpublished.

____. N.d. The Correction of Child Mortality. Estimates from Proportions of Children Dead by Age of Mother to Allow for Changing Death Rates. Unpublished.

Brass, William, and Ansley J. Coale. 1968. Methods of Analysis and Estimation. In the Demography of Tropical Africa, ed. by William Brass, pp. 88-150. Princeton: Princeton University Press.

Brass, William, and Kenneth Hill. 1973. Estimating Adult Mortality from Orphanhood. International Population Conference, Liége, 1973, v. 3, pp. 111-123. Liége: international Union for the Scientific Study of Population.

Brass. W. et. Al. (1968). The Demography of Tropical Africa.

Brass, W. (1971). On the Scale of Mortality. (in Brass, W. (ed)). Biological Aspects of Demography (London: Taylor and Francis, 1971).

Brass and Bamgboye (1981). The time located of reports of survivorship. Estimates for Maternal and Paternal orphanhood. Research paper 81-1. Centre for Population Studies, London School of Hygiene and Tropical Medicine (1981).

Brass, W., and Hill, K. (1973). Estimating Adult Mortality from Orphanhood, in International Population Conference, Liege, 1973. Liege: International Union for the Scientific Study of Population.

Brass, W. (1975). Methods for Estimating Fertility and Mortality from Limited and Defective Data. The Carolina Population Centre, University of North Carolina, Chapel Hill.

Brass, W. (1979). A Procedure for comparing Mortality Measures Calculated from Intercensal Survival with the Corresponding Estimates from Registered Deaths: Asian and Pacific Census Forum, 6(2), 5-7.

Brass, W. (1980). Paths and Problems in the Analysis of Mortality Differentials. Proceedings of the UN/WHO Meeting, Mexico City, 19-25 June, 1979. New York: United Nations.

Brass, W. and Bamgboye, E. (1981). The Time Location of Survivorship: Estimates for Maternal and Paternal Orphanhood and the Ever-Widowed. Centre for Population Studies, London School of Hygiene and Tropical Medicine. University of London. Working Paper No. 81-2.

Brass, W. (1985). Advances in Methods for Estimating Fertility and Mortality from Limited and Defective Data. An Occasional Publication of the Centre for Population Studies, London School of Hygiene and Tropical Medicine: University of London.

Carrier, Norman H. 1958. A Note on the Estimation of Mortality and Other Population Characteristics, Given Deaths by Age. Population Studies, v. 12, no. 2, pp. 149-163.

Carrier, Norman H. , and A.M. Farrag. 1959. The Reduction of Errors in Census Populations for Statistically Underdeveloped Countries. Population Studies, v. 12, no. 3, pp. 240-285.

Carrier, Norman H., and Thuan-Jig Goh. 1972. The Validation of Brass's Model Life Table System. Population Studies, v. 26, no. 1, pp. 29-51.

Carrier, Norman H., and John Hobcraft. 1971. Demographic Estimation for Developing Societies. London: Population investigation Committee, London School of Economics.

Central Statistics Office: 'The Analytical Report: 1985 Population and Housing Census of Sierra Leone', Freetown, Sierra Leone.

Chahnazarian, A. (1988). Factors Associated with Survey Omission of Dead Children: Evidence from a Reinterview Survey in Zaire, in African Population Conference, Daka 1988. Liege: International Union for the Scientific Study of Population.

Chandra Sekar, C., and W. Edwards Demind. 1949. On a method of Estimating Birth and Death Rates and the Extent of Registration. Journal of the American Statistical Association, v. 44, pp. 101-115.

Coale, Ansely J., and Paul Demeny. 1966. Regional Model life Tables and Stable Populations. Princeton: Princeton University Press.

Coale, A.J., and Demeny, P. (1966). Regional Model Life Tables and Stable Population, Princeton University Press.

Coale, A.J., and Trussell, T.J. (1974). Model Fertility Schedules: Variations in the Age Structure of Childbearing in Human Populations, Population Index, 40 (2), (April 1974) pp. 195-258.

Ewbank, D.C. (1983). A Reducible four-parameter system of model life tables. Population Studies 37,1.

Ewbank, D.C. (1984) Uses of Mortality Data for Evaluating the Success of Specific Health Development Programs, in Data Bases for Mortality Measurement. New York: United Nations.

Ewbank, D.C.. (1986). Evaluation of Model Life Tables for East Africa. International Union for the Scientific Study of Population and the institute of Statistics, University of Siena. Siena, Italy July (1986).

Fargues, Philippe, and Youssef Courbage. 1972. Working Paper for UNESOB Expert Group Meeting on Mortality, Beirut, 1972. Unpublished.

Feeney, G. (1980). Estimating Infant Mortality Trends from Child Survivorship Data, Population Studies 34,1.

Glover, James W. 1921. United States Life Tables, 1890, 1901, 1910, and 1901-1910. Washington, D.C.: U.S Bureau of the Census.

Graham, W., and Timaeus, I. (1988). Measuring Adult Mortality in Developing Countries: A Review and Assessment of Methods. Centre for Population Studies, London School of Hygiene and Tropical Medicine. University of London. Research Paper 88-4 (December 1988).

Henry, Louis. 1960. Mesure indirecte de la mortalité des adultes. Population, v. 15, no. 3, pp. 457-466.

Herny, L. (1960). Measure Indirecte de la Mortalite des Adultes. Population 15, 457-466.

Hill, A. et al. (1982). The Mortality and Fertility of Farmers and Pastoralists in Central Mali (1950-1981): Centre for Population Studies, London School of Hygiene and Tropical Medicine. C.P.S. Research Paper, No. 82-4.

Hill, Kenneth H., and John Blacker. 1971. Some Problems of African Demographic Analysis. Report on discussions held in London, 17 May – 1 June 1971 with William Brass at the London School of Hygiene and Tropical Medicine, Appendix I. Unpublished.

Hill, K. (1975). Indirect Methods of Estimating Adult Mortality Levels: Ph.D. thesis – university of London.

Hill, K. (1977). Estimating Adult Mortality Levels from Data on Widowhood, Population Studies, 31, 75-84.

Hill, K., ad Trussell, T.J. (1977). Further Development in Indirect Mortality Estimation Population Studies 31, 313-333.

Kamara, J.A.L. (1984). Infant Mortality and Fertility in Sierra Leone: Unpublished M.sc. Thesis, Department of Statistics, University of Stockholm (Sweden).

Kamara, J.A.L. (1988). The Use of Model Life Tables in the Estimation of Mortality Trends for Africa Countries, in African Population Conference, Dakar, 1988. Liege: International Union for the Scientific Study of Population.

Kamara, J.A.L. (2001). A probabilistic Approach to explain Causes of Death Among Women Classified to be in the High Risk Group: A case Study of Women in the Western Area of Sierra Leone, in Journal of Pure and Applied Sciences, Vol. 7, 2001

Kamara, J.A.L.; Lansana, Antonia (2001). The use of Model Systems to link child and adult mortality levels: Peru Data, XXIV IUSSP World Population Conference, Brazil, 2001

Kamara, J.A.L. (2002). A Multistate life table model to show the impacts of HIV and AIDS on a simulated population: a case of Sierra Leone, in Journal of Pure and Applied Sciences, Vol. 8, 2002

Kenya-Central Statistics Office: (1979). Kenya 1979 Census Report.

Ledermann, Sully. And Jean Breas. 1959. Les dimensions de le mortalité. Population, v. 14, no. 4, pp. 637-682.

Lotka, a.J. 1931. Orphanhood in Relation to Demographic Factors: A Study in Population Analysis. Metron, v. 9, pp. 37-109.

Moser, K. (1983). Levels and Trends in Child and Adult Mortality in Peru. Centre for Population Studies, London School of Hygiene and Tropical Medicine. University of London. Working Paper No. 83-4 (June 1983).

Owusu, J.Y. (1988). Improving Quality of Responses to Basic Demographic Questions: A Review of Recent Developments, in African Population Conference, Dakar. 1988. Liege: International Union for the Scientific Study of Population.

Palloni, A. (1980). Estimating infant and Childhood Mortality Under Conditions of Changing Mortality. Population Studies 34, 1.

Palloni, A. et al. (1984). Estimating Adult Mortality with Maternal Orphanhood Data: Analysis and Sensitivity of Techniques. Population Studies 38,2.

Palloni, A., and Heligman, L. (1986). Re-Estimation of the Structural Parameters to Obtain Estimates of Mortality in Developing Countries. Population Bulleting of the United Nations, 18, 10-33.

Preston, S.H., and Palloni, A. (1977). Fine Tuning Brass-Type Mortality Estimates with data on ages of surviving children. Population Bulletin No. 10 – 1977 New York. United Nations, Department of Social and Economic Affairs 1978.

Preston, S.H., Coale, A.J., Trussel, J., and Weinstein, W. (1980). Estimating the Completeness of Adult Deaths in Populations that are approximately stable. Population Index. 46, 179-202.

Preston, S.H., Hill, K. (1980). Estimating the Completeness of Death Registration. Population Studies 34, 349-366.

Preston, S.H. (1983). An Integrated System for Demographic Estimation from two age Distributions, Demography, 20, 213-226.

Preston, S.H. (1983). Use of Direct and Indirect Techniques for Estimating the Completeness of Death Registration Systems, in Data Bases for Mortality Measurement. New York: united Nations.

Republic of Mauritius: 'Analysis Report Volume VI – Health & Quality of life, Morbidity and Mortality

Shryock, H.S., and Siegel, J.S. (1976). The Methods and Materials of Demography. London Academic Press.

Sierra Leone Government, Central Statistics Office: 'The Status of Women and, Children in Sierra Leone (MICS2)', November 2000.

Sierra Leone Government, MCH Division, Central Statistics Office: 'Expanded Programme on Immunization National Coverage Evaluation Survey 2001', December 2001.

Sullivan, J.M. (1972). Models for the Estimation of the Probability of Dying Between Birth and Exact Ages of Childhood. Population Studies, 26(1), (March 1972), pp.82-83.

Sullivan, J. (1974). Mortality Estimates Derived from Retrospective mortality Data During Periods of Fluctuating Mortality. Demografi Indonesia. 2, (1) (December 1974).

Sullivan, Jeremiah M. 1972. Models for the Estimation of the Probability of Dying between Birth and Exact Ages of Early Childhood. Population Studies, v. 26, no. 1, pp. 79-97.

Timaeus, I. (1984). Mortality in Lesotho: A Study of Levels, Trends and Differentials based on Retrospective Survey Data. W.F.S. Scientific Reports. No. 59.

Timaeus, I. (1986). An Assessment of the Methods for Estimating Adult Mortality from two sets of Data on Maternal Orphanhood. Demography, 23, 435-450.

Timaeus, I. (1987b). Adult Mortality in Sub-Saharan Africa. World Bank Expert Consultation on Disease and Mortality.

Timaeus, I. (1987a). Estimation of Fertility and Mortality from W.F.S. Household Surveys, in the World Fertility Survey: An Assessment. Cleland, J. and Scott, C.S. (eds). Oxford Clarendon Press.

Timaeus, I., Graham, W. (1988). Measuring Adult Mortality in Developing Countries: A Review of Methods. Centre for Population Studies Working Paper 88-4. London School of Hygience and Tropical Medicine.

Timaeus, I., Advances in the Measurement of Adult Mortality from Data on Orphanhood. Research paper 90-1. Centre for Population Studies, London School of Hygiene and Tropical Medicine (1990).

Trusell, T.J. (1975). A Re-Estimation of the multiplying Factors for Determining Childhood Survival, Population Studies, 29 (1) March 1975. pp. 97-107.

United Nations. 1952. Population Bulletin No. 2. New York.

____. 1955. Age and Sex Pattern of Mortality: Model Life-Tables for Under-Developed Countries. Population Studies No. 22. Sales No.: 1955.XIII.9. New York.

____. 1967. Manual IV. Methods of Estimating Basic Demographic Measures from Incomplete Data. Population studies No. 42. Sales No.: E.67.XIII.2. New York.

____. 1968. The Concept of a Stable Population, Application to the Study of Populations of Countries with Incomplete Statistics. Population Studies No. 39. Sales No.: E.65.XIII.3. New York.

United Nations (1967). Methods of Estimating Basic Demographic Measures from Incomplete data: New York: United Nations.

United Nations (1982): New Model Life Tables fro Developing Countries. Population Studies, No. 77.

United Nations (1983). Manual X. Indirect Techniques for Demographic Estimation. Population Studies, No. 77.

United Nations (1983). Manual X. Indirect Techniques for Demographic Estimation, population Studies, No. 81.

United Nations: Rev.1 - Principles and Recommendations for Population and Housing Censuses, United Nations, New York, 1998 U.S. National Library of Medicine: Medical Encyclopaedia, 2005

Williams M. L. J.: 'The socio-economic status of the disabled in Sierra Leone,' a case study of the disabled in the Western Area, M.Sc. (Statistics) Unpublished Thesis presented to the Njala University College, USL.

World Health Organization: International Classification of Impairment, Disabilities, and Handicaps, WHO, Geneva, 1980

Zaba, B. (1979). The Four Parameter Logit Life Table System, Population Studies, No. 33.1.