# SIERRA  LEONE
# NATIONAL  NUTRITION
# SURVEY 2017

# SIERRA  LEONE

# NATIONAL   NUTRITION SURVEY 2017

# August 28 – October 10, 2017

## FOREWORD

The implementation of Sierra Leone National Nutrition Survey 2017 was led by technical oversight and management of Action Against Hunger's Consultant, Dr Tom Oguta, who was recruited from Action Against Hunger Canada roster of SMART Survey consultants. The consultant managed the survey from Planning, Implementation, Data Analysis, and Reporting. The consultant disseminated preliminary report in October 2017 and collected inputs from participants that were used later to finalize the report. The consultant did coordination of the survey from training, field pretest, including management of Data entry, quality control, and analysis and reporting.

This report summarizes the findings of Sierra Leone National Nutrition Survey of 2017, funded by Irish Aid and carried out by the Ministry of Health and Sanitation (MoHS), Directorate of Food and Nutrition (DFN) and Action Against Hunger. The fieldwork took place between August 28th and October 10th, 2017.

Additional information regarding Sierra Leone National Nutrition Survey 2017 can be obtained from:

Directorate of Food and Nutrition
Ministry of Health and Sanitation, Sierra Leone
Central Medical Stores, Freetown Sierra Leone
Telephone: +23276300770
Email: shamitamin@gmail.com

Further information regarding Sierra Leone National Nutrition Survey can also be obtained from:

Country Director/Head of Mission
Action Against Hunger, 10 Sall Drive
Cockle Bay, Off Aberdeen Road
Freetown, Sierra Leone
Telephone: +23278151217
Email: hom@sl.missions-acf.org

**National Coordination and Management Committee of SLNNS 2017**

Aminata Shamit Koroma (Directorate of Food and Nutrition-MOHS Sierra Leone)
Kajali Paintal (Nutrition Program Manager-UNICEF
Hannah Yankson (Nutrition Officer- World Health Organization- WHO)
Fortune Maduma (Nutrition Officer-World Food Program-WFP)
Damarice Ager (Action Against Hunger-Health and Nutrition HoD)
Mumin Kallon (Action Against Hunger (Deputy HoD Nutrition)
Francis Tommy (Statistics Sierra Leone- Principal Statistician)
Dr. Mohammed Foh (SUN Secretariat)

**Dr Brima Kargbo**
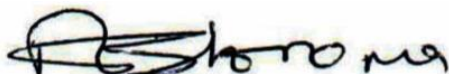**Chief Medical officer**
**Ministry of Health and Sanitation**

**Anwar Ali**
**Country Director**
**Action Against Hunger Sierra Leone**

## ACKNOWLEDGEMENT

The Directorate of Food and Nutrition within the Ministry of Health and Sanitation role is to oversee nutrition status of Sierra Leonian population and offer directives for improving and ensuring population to meet their nutritional needs in order to prevent undernutrition. The implementation of Sierra Leone National Nutrition Survey 2017 remained successful because of joint efforts and consultations with Nutrition Technical Working Group (NTWG) members that include UNICEF, WFP, WHO, FAO, MAFFS, Sun Secretariat, Statistics Sierra Leone, Action Against Hunger, Helen Keller, Focus 1000 and other individuals who might have not been mentioned. The coordination of SLNNSwas well organized and managed by the DFN from inception to final implementation of the activity. The NTWG were exceptional during this period since they were also responding to the Mudsilde emergency at the same time, this did not prevent them from ensuring the two important activities were accomplished simaltaniously.

The DFN and entire NTWG would like to convey special gratitude to Irish Aid for funding the Survey, and Action Against Hunger for providing the leadership on successful completion of the survey in collaboration with the DFN and NTWG members. Special thanks goes to Sierra Leone Statistics, Francis Tommy who was instrumental in ensuring sampling was done in accordance with incountry policies and production of maps that supported survey team in the field throughout the activity implementation. Special recognition is extended to WHO, UNICEF, FAO, WFP, MAFFS, SUN Secretariat, Action Against Hunger and Helen Keller for technical support offered during the activity implementation till preliminary and final report dissemination; their contribution especially during preliminary report dissemination made it easier for consultant to produce final results timely. More recognition and thanks goes to DHMT members, the DMOs who offered technical insight during preliminary report dissemination.

DFN and Action Against Hunger would also like to extend further gratitude to WHO and Focus 1000 for their support in providing Tablets for data collection and WFP for transportation assistance in Makeni and Tonkolili districts. Lastly, the DFN would like to extend appreciation to Action Against Hunger not only for managing funds and logistics and entire coordination but also technical support thorought the survey. The enormous technical oversight offered from Action Against Hunger headquarter in Paris from Nutrition and Health Technical Advisors was commendable; these include identification, evaluation and recruitment of survey consultant, remote backup to the consultant and final dissemination of report to stakeholders.

**Aminata Shamit Koroma**
**Director of Food and Nutrition**
**Ministry of Health and Sanitation**

## Table of Contents

## List of Tables

## List of Figures

## List of Abbreviations & Acronyms

| | | | | | |
|---|---|---|---|---|---|
| **AAH-SL** | : | Action Against Hunger, Sierra leone | **ITN** | : | Insecticide Treated Net |
| **ACF-F** | : | Action Contre La Faim, France | **IYCF** | : | Infant and Young Child feeding |
| **BMI** | : | Body Mass Index | **LLITN** | : | Long Lasting Insecticide Treated Net |
| **CDR** | : | Crude Death Rate | **MAM** | : | Moderate Acute Malnutrition |
| **CHC** | : | Community Health Center | **MICS** | : | Multiple Indicator Cluster Survey |
| **CHP** | : | Community Health Post | **MOHS** | : | Ministry of Health and Sanitation |
| **CI** | : | Confidence interval (at 95% throughout report) | **MUAC** | : | Mid Upper Arm Circumference |
| **CSD** | : | Child Survival and Development | **NCA** | : | Nutrition Causal Analysis |
| **DEFF** | : | Design Effect | **NFNS-IP** | : | National Food and Nutrition Security Implementation Plan |
| **DFN** | : | Directorate of Food and Nutrition | **NFNSP** | : | National Food and Nutrition Security Policy |
| **DHS** | : | Demographic Health Survey | **NGO** | : | Non-Governmental Organization |
| **EA** | : | Enumeration Area | **NNIS** | : | National Nutrition Information System |
| **ENA** | : | Emergency Nutrition Assessments | **NNS** | : | National Nutrition Strategy |
| **EPI** | : | Expanded Programme on Immunization | **OTP** | : | Out-Patient Therapeutic Programme |
| **FCS** | : | Food Consumption Score | **PLW** | : | Pregnant & Lactating Women |
| **FCG** | : | Food Consumption Group | **PPS** | : | Probability Proportional to Size |
| **FSL** | : | Food Security and Livelihoods | **PRSP** | : | Poverty Reduction Strategy Papers |
| **GAM** | : | Global Acute Malnutrition | **rCSI** | : | reduced Coping Strategy Index |
| **GFD** | : | General Food Distribution | **RUSF** | : | Ready to Use Supplementary Food |
| **HAZ** | : | Height for Age Z scores | **RUTF** | : | Ready to Use Therapeutic Food |

| | | |
|---|---|---|
| **HDDS** | : | Household Dietary Diversity Score |
| **HFA** | : | Height for Age |
| **HH** | : | Household |
| **HHS** | : | Household Hunger Scale |
| **HKI** | : | Hellen Keller International |
| **HMIS** | : | Health Management Information System |
| **IDPs** | : | Internally Displaced Persons |
| **IMAM** | : | Integrated Management of Acute Malnutrition |
| **INGO** | : | International Non-Governmental Organization |
| **IPC** | : | Integrated Phase Classification |
| **TSFP** | : | Targeted Supplementary Feeding Program |
| **U5DR** | : | Under 5 Death Rate |
| **UNHCR** | : | United Nations Higher Commission for Refugees |
| **UNICEF** | : | United Nations International Children's Emergency Fund |
| **VAD** | : | Vitamin A Deficiency |
| **WASH** | : | Water, Sanitation and Hygiene |
| **VAS** | : | Vitamin A Supplementation |

| | | |
|---|---|---|
| **SAM** | : | Severe Acute Malnutrition |
| **SC** | : | Stabilization Centre |
| **SCUK** | : | Save the children, UK |
| **SD** | : | Standard Deviation (measure of spread around the mean) |
| **SE** | : | Standard Error |
| **SFP** | : | Supplementary Feeding Programme |
| **SLNNS** | : | Sierra Leone National Nutrition Survey |
| **SMART** | : | Standardized Monitoring and Assessment of Relief and Transitions |
| **SSL** | : | Statistics Sierra Leone |
| **TFC** | : | Therapeutic Feeding Program |
| **TWG** | : | Technical Working Group |
| **WAZ** | : | Weight for Age Z scores |
| **WFA** | : | Weight for Age |
| **WFP** | : | World Food Program |
| **WFH** | : | Weight for Height |
| **WHO** | : | World Health Organization |
| **WHZ** | : | Weight for Height Z scores |

## Glossary

**Body mass index (BMI):** An index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. . It is defined as the weight in kilograms divided by the square of the height in metres ($kg/m^2$). Both high and low indexes are associated with poor health. The normal range for a healthy adult is 18.5 to 24.9. A BMI below 18.5 is considered too lean, while one above 25 is considered overweight. A BMI greater than 30 is considered obese, and one greater than 40 is considered morbidly obese.

**Breastfeeding:** Child having received breast milk either directly from the mother or wet nurse breast within the last 12 hours.

**Coping Strategies Index (CSI):** A numerical indicator of household food security based on a questionnaire about what people do in the absence of sufficient food or money to buy such food. CSI is used to predict food crises, identify specific areas of greatest need, and assess the impact of food aid programs in emergencies and to outline long-term trends.

**Exclusive breastfeeding:** means that the infant receives only breast milk. No other liquids or solids are given – not even water – with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines. Exclusive breast-feeding is recommended for the first six months of life.

**Food security:** situation that exists when 'all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life'. It entails availability, access, and utilization of sufficient food by all people at all times for an active, healthy life.

**Food Consumption Score (FCS):** Food consumption pattern is computed based on Food Consumption Score (FCS), which is a weighted score of frequency of consumption of food groups and the nutritional value of the food. Based on the FCS, households are classified into food consumption groups as poor, borderline, acceptable.

**Global Acute Malnutrition (GAM)** is the term used to include all children with moderate wasting, severe wasting and/or oedema. It is defined as weight-for-height below -2 standard deviations from the mean, and or no oedema.

**Household Dietary Diversity Score (HDDS):** is a measure of the range of food groups (cereals, vegetables, meat, fish, etc) consumed in a household over a reference period (24 hours recall). Twelve food groups are used in the evaluation and the HDDS ranges from 0 to 12. Households Dietary Diversity relates to nutrient adequacy (coverage of basic needs in terms of macro and micronutrients) and to diet variety/balance, which are two of the main components of diet quality.

**Household Hunger Scale (HHS):** is a tool to measure household food deprivation, used to improve targeting of interventions and evaluate food security policies. A simple questionnaire produces one of three scores: Little to no household hunger; moderate household hunger; and severe household hunger.

**Integrated Food Security Phase Classification (IPC):** is a scale developed by UN agencies and NGOs using existing data (mortality rates, GAM, access to food and water, security, etc) to place geographical areas into phases of food security ranging from "Generally food secure" to "Famine", with the aim of harmonizing humanitarian analysis of and responses to crises, and ensuring the most efficient allocation of resources.

**Livelihood:** refers to the ways in which people earn an income, provide for themselves and their families. Programs that support livelihoods are designed to increase communities' ability to survive (economic, weather, etc) shocks.

**Low Birth Weight (LBW):** An infant born weighing less than 2,500 grams (5.5 pounds). In rural areas, this is estimated by the infant's "relative size" to other babies, as assessed by the birth attendant or mother.

**Malnutrition:** refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. Malnutrition covers two (2) broad groups of conditions: 1) undernutrition -which includes *stunting* (low height for age), *wasting* (low weight for height), *underweight* (low weight for age) and *micronutrient deficiencies* or insufficiencies (a lack of important vitamins and minerals); 2) overnutrition – which includes overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and cancer).

**Mid-upper arm circumference (MUAC):** One of the anthropometric measures used in assessing nutritional status. It is always measured on the left arm.

**Moderate acute malnutrition (MAM)** or **moderate wasting**: is defined as weight-for-height between -3 and -2 standard deviations from the mean, or mid-upper arm circumference (MUAC) between 115 and 125 mm, and no oedema).

**Oedema: Pitting oedema on both feet (bilateral oedema)** is the sign of kwashiorkor. Any person with bilateral oedema has severe malnutrition and is classified as severely malnourished even if the WFH z- score is normal.

**Severe Acute Malnutrition (SAM)** is the term used to include all children with severe wasting or mid-upper arm circumference (MUAC) below 115 mm or children who have oedema.

**Severe stunting, wasting, or underweight rate:** A common benchmark used in health and nutrition studies. It is technically defined as the percentage of children under five years of age who suffer from severe stunting, wasting, or underweight, defined, respectively, as having a height-for-age, weight-for-height, or weight-for-age value that is equal to or smaller than the value corresponding to three standard deviations below the median of the WHO reference population— that is, the value corresponding to –3 Z-scores with respect to WHO reference population (see also the definitions of stunting, wasting, and underweight).

**Stunted** growth, also known as **stunting** is impaired growth and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation; and major effect of, or adaptation to – chronic (as opposed to acute) malnutrition, which can impede both physical and cognitive development. Children are defined as stunted (short for one's age) if their height-for-age is more than two standard deviations below the WHO Child Growth Standards median.

**Undernutrition:** defined as failure to get enough nutrients for a healthy body, undernutrition takes four (4) broad sub-forms of undernutrition: wasting, stunting, underweight, and deficiencies in vitamins and minerals.

**Underweight:** When a child has low weight compared to other children his or her age. "Underweight" is one way to measure malnutrition. It is defined as weight-for-age that is equal to or smaller than the value corresponding to two standard deviations below the median of the global

reference population— that is, the value corresponding to –2 Z-scores with respect to the global reference population (a population with a distribution of weight-for-age values that is considered normal by international standards).

**Vitamin A deficiency:** A form of micronutrient deficiency resulting from inadequate intake or high loss of vitamin A. Symptoms include growth retardation, night blindness in mild deficiency, and xerophthalmia (drying of the cornea), which leads to complete blindness. In areas where vitamin A deficiency is a public health problem, routine vitamin A supplementation is recommended in infants and children 6-59 months of age as a public health intervention every 6 months to improve vitamin A status and reduce child morbidity and mortality in the long term.

**Wasting:** Being thin in relation to one's height is defined as weight-for-height less than minus two standard deviations below the median of WHO reference population. It is a symptom of acute undernutrition in children, usually a consequence of insufficient food intake or a high incidence of infectious diseases, especially diarrhoea.

**Z-score:** also known as standard score is the number of standard deviations from the mean of a normalized distribution of a reference population, in this case the WHO reference population. It is calculated as the difference between individual value and the population mean, divided by the population standard deviation.

## EXECUTIVE SUMMARY

The Sierra Leone National Nutrition Survey 2017 started on 28 August and ended on October 10, 2017. The Directorate of Food and Nutrition (DFN) of Sierra Leone's Ministry of Health and Sanitation (MOHS) and Action Against Hunger Sierra Leone, with funding from Irish Aid conducted the survey in close collaboration and partnership with Sierra Leone Nutrition Technical Working Group (TWG). A nutrition and mortality assessment using SMART methodology was applied and the survey covered 15 statistical (14 districts plus 1) domains countrywide, including the two districts of Bonthe and Kailahun that were not assessed during 2014 SLNNS. The main objective of the survey was to assess the current nutrition status of the population especially children 6-59 months old and women of reproductive age (15-49 years of age). Also included in the survey was a retrospective mortality rate in the population at district level;  and to evaluate the major contextual factors contributing to undernutrition such as infant and young child feeding (IYCF) practices; Food Security; Water, Sanitation and Hygiene (WASH); and Health situation in Sierra Leone. Sierra Leone National Nutrition survey using SMART methodology  assessment carried out in 2014 compared with 2010 Sierra Leone National Nutrition survey results had shown improvements prior to Ebola crisis. Hitherto, no up-to-date data for nutrition was available in Sierra Leone that reflects post-Ebola context. The survey findings would thus help to evaluate progress in nutrition interventions and to guide further program planning priorities for direct and indirect nutrition interventions.

A two-stage cluster sampling methodology was used, and a total of 9069 children aged 6-59 months from 9469 households in 477 clusters were examined for anthropometry, 4550 children aged 0-23 months assessed forIYCF practices including 1106 children aged 0-5 months assessed for exclusive breastfeeding practices. A total of 9,496 women (2, 784 pregnant/lactating and 6712 non pregnant/lactating) were assessed for their nutrition status and dietary diversity. Assessment on mortality was conducted concurrently in 8959 households with the mean household size of 4.5 (±1.9) persons. Household related data, such as food security and livelihoods, water, sanitation and hygiene (WASH) as well as health access were also collected in the 9469 households during the assessment.

The national prevalence of Global Acute Malnutrition (GAM) was **5.1%** (95%CI: 4.6-5.6), moderate acute malnutrition (MAM) was **4.0%** (95% CI: 3.6-4.5) and the severe acute malnutrition (SAM) rate (WHZ<-3 or oedema) was **1.0%** (95%CI: 0.8-1.3), including six (0.1%) cases of oedema. Boys were more acutely malnourished than girls were (*p*<0.05), and younger children (aged 6-29 months) were more malnourished (*p*<0.05) than the older (aged 30-59 months) children.

The results indicate acute malnutrition at indicate a *poor* nutrition situation phase (GAM rate of 5.0-9.9%) according to WHO classification according to WHO classification, and translate to 47,861 wasted children nationally. Although SLNNS 2017 findings shows slight increase in GAM and MAM rates, but compared to the SLNNS 2014 findings, GAM and MAM rates were 4.7% (95% CI: 4.3-5.2) and 3.7% (95% CI: 3.3-4.1) respectively. The deterioration is not statistically significant, even after adjusting for the exclusion of two districts (Bonthe and Kailahun) that were not assessed during SLNNS 2014, but significant deterioration during SLNNS 2017 was observed in the Western Area especially Urban section.

The national prevalence of stunting (HAZ<-2) was **31.3%** (95% CI: 30.0-32.6) translating to 293,736 stunted children (based on 2015 population census) with 21.3% (95% CI: 20.3-22.3) moderately stunted and 10.0% (95% CI: 9.2-10.7) severely stunted, with more boys than girls reportedly stunted ($p$<0.05). Stunting rates were also not statistically different compared to the SLNNS 2014 findings, even after exclusion of the two districts. Although the levels of both wasting and stunting have shown an improving trend over the past 10 years, stunting rates remain high (>30%) indicating a persistent *serious* chronic malnutrition according to WHO Classification that needs to be addressed comprehensively.

The national prevalence of acute malnutrition using MUAC (<23 cm) was **5.7%** among the pregnant and/or lactating women and **5.1%** based on BMI of non pregnant/lactating women. The prevalence of overweight and obesity was **18.4%** and **7.5%** respectively.

The crude death rate (CDR) and under five death rate (U5DR) of **0.19** (95% CI: 0.15-0.24) and **0.16** (95% CI; 0.10-0.27) were recorded respectively. The national (CDR) and (U5DR) rates are below the SPHERE *alert* thresholds of 1/10,000/day and 2/10,000/day respectively and no significant change observed from the (CDR) of **0.36** deaths/10,000/day and (U5DR) of and **0.83** under five deaths/10,000/day reported in SLNNS 2014.

Although breastfeeding is a widespread practice among the population with nearly all the assessed children 0-23 months ever breastfed **(99.1%), 88.2%** still breastfeeding and 61.6% of 0-6 months breastfed exclusively. There are significant variations in rates of breastfeeding and complementary feeding indicators in some districts especially Western Area Urban, Bonthe and Tonkolili that would require more effort to promote optimum breastfeeding benefits. Complementary foods are still introduced to a large number of children (40%) before the age of six months which is earlier than the WHO's recommendation of initiation of complementary feeding from 6 months. Mothers' practice of early introduction to complementary feeding expose these children to unhygienic feeding conditions and vulnerability to illnesses. More than 70% of the children receive undiversified diet with poor monotonous diets reported widely in all the districts. More than **50%** of the children (6-24 months) assessed do not meet the recommended minimum meal frequency for their age and breast feeding status and very few (13.9%) are fed on vitamin A rich foods.

Although no disease outbreak was reported during the assessment, about one-quarter **(22.1%)** of children had reportedly suffered from one or more childhood illnesses in the two weeks prior to the assessment. Of those, who fell ill **75%** of the children had fever; about **36%** had cough and 6% reportedly had diarrhea. A further 19% reported suffering from other illnesses especially skin and eye infections. Proportion of children who slept under mosquito net was **(93.4%)** and vitamin A supplementation coverage was **(80.3%)** indicating good coverage. However, measles immunization coverage was **(71.5%)** and deworming coverage was **(69.1%)**[1] in the preceding 6 months. There was a short fall in deworming coverage below SPHERE recommended standard levels of **80%**,  but this short fall could be attributed to recall bais since the SLNNS 2017 was conducted 4 months after the last deworming campaign, as post event coverage survey for deworming conducted within a week indicated  coverage over 85%.

---

[1] It is worth noting that the rates are likely to be higher given that the SMART survey was 4 months after the last round of mass deworming and is subject to recall bias. All post event coverage surveys performed within the recommended 1 month show deworming coverage well over 85%

In conclusion acute nutrition situation in the country is *poor*, chronic malnutrition as expressed by high stunting rates is *serious* according to WHO reference classifications although crude and under five mortality rates remain below the SPHERE *alert* levels. The occurrence of both under and over nutrition in children and women is an indication of the emerging double burden and complexity of malnutrition in the country.

Even though the key underlying factors affecting the nutritional status of the children i.e. morbidity, food insecurity, poor child care, lack of safe drinking water and limited sanitation and hygiene facilities remain key risk factors, it is important to note that malnutrition is multifaceted and chronic malnutrition is hinged on the basal socio-economic, education and cultural structures. The 2013 GoSL Nutrition for Growth (N4G) commitment of reducing the prevalence of stunting from **25.7%** to **11.7%** by 2020, and achieving the 2030 Agenda for Sustainable Development of meeting internationally agreed targets on stunting and wasting in children under 5 years of age by 2025 require continued concerted and integrated efforts among all the relevant sectors in the country. ***Table 1 provides a summary of the key findings. Specific recommendations are outlined below:***

The ***poor*** acute nutrition situation and ***serious*** chronic nutrition situation in the country is attributed to multiple and interrelated factors that call for continued integrated intervention efforts to address both immediate needs in addition to developing long-term strategies to enhance access to basic services; support to sustain livelihood systems and social protection mechanisms. Specific recommendations include:

**Immediate Interventions**

- Evaluate the need to maintain scale up of IMAM programme for rehabilitation of acutely malnourished children through sustained active case finding, continued self-referrals and capacity building of the existing CHP, CHC and MCHP staff and the community to manage acutely malnourished children.
- Since the surveys has shown that nutrition admissions screening using MUAC is less sensitive and leaves out a significant proportion of deserving malnourished cases, the GoSL/MoHS should review the guidelines to use weight-for-height Z scores for admissions and encourage its implementation at the community/health facility levels.
- Since the establishment of the national IMAM program and supportive treatment programs and associated WASH, food security and livelihood interventions by DFNS, line ministries and national NGOs with support from international UN and NGO partners, the MoHS covered many facilities and districts which did not have nutrition (SC,OTP, STP) services. It is important to maintain these services and to scale-up to more places that still do not have these nutrition services.
- Protect the significant gains made over the years by strengthening the interagency and interdepartmental emergency response teams amidst the risks of shocks such as Ebola and cholera outbreaks, land/mud slides, flooding and droughts arising from climatic changes.
- Cognizant to intensified health and nutrition education and interventions for improving social security, water, sanitation and hygiene (WASH) practices alongside nutrition programmes by the government and different UN & NGO programmes, these programmes need to be strengthened through integrated planning and implementation. Health, FSL and WASH based interventions should complement national nutrition programs in order to address the underlying causes of malnutrition
- Conduct an integrated Nutrition Causal Analysis (NCA) Study for malnutrition such as LinkNCA to identify the predominant causes of stunting in a few satellite districts and prioritize

key areas of intervention. The study should include a qualitative enquiry to understand why boys tend to be more malnourished in the country as shown in this survey.

- Conduct a Cost of Hunger (COHA) study for Sierra Leone to quantify the economic impact of malnutrition on the country's development for high-level advocacy to the government and financial institutions/partners to invest more on nutrition.

- Coverage (SQUEAC or SLEAC) survey to evaluate coverage in districts with ongoing health and nutrition interventions by the government and different agencies since SMART survey is just indicative as it only determines the immunization status of the entire population.

- Intensify health and nutrition education activities on good IYCF practices targeting caregivers with focus on promoting exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvements in household hygiene including health seeking behaviors and practices, through women support groups within the communities who are advocating for optimal IYCF. Continued health education to sensitize the community on domestic treatment of drinking water and proper disposal of human faecal waste to avoid contamination of water sources is encouraged.


**Long term Interventions**

- Put stunting prevention into the forefront of the national nutrition agenda targeting the critical first 1000 days of life to produce greater impacts on health and education in the medium-term and on economic productivity and inclusive growth in the longer term.

- Support food and agriculture based interventions in complement to national nutrition programmes that focus on evidence based (Bhutta, et al. 2015) preventive and treatment layers in the management of acute and chronic malnutrition. Focus should be given to the improvement of nutrition sensitive community and household food production systems that produce diverse nutrient-rich cereal foods, legumes, fruits and vegetable.

- Review policies relating to nutrition and food security based on the new evidence presented by the SMART survey, more specifically, the survey data should be used in the process of reviewing the National Food and Nutrition Security Implementation Plan to pave the way for integrated multisectoral and multistakeholder coordination to address undernutrition in Sierra Leone.

- Improve the policy environment to promote and deliver IYCF practices and services by ensuring the availability of legislation on the Regulation on Marketing of the breast milk substitutes.

- Increase supply of and access to more nutritious/diverse foods through social and behaviour change communication on consumption of fruits, vegetables and pulses (legumes), through home production and/or market purchase. There is need to further complement recipes preparation and promotion to improve the diversification of the meals.

- Scale-up the six monthly point of contact nationwide that promotes the timely introduction of hygienically prepared, nutrient dense complementary foods with the mothers' participation under supervision intergrated within a package of high-impact interventions including VAS, deworming and routine counselling on child-spacing and provision of family planning commodotites as appropriate,

- Support milk production and consumption in collaboration with relevant institutions, ministries and departments to improve dietary diversity from animal source foods.

- Strengthen the national nutrition surveillance system in integration with HMIS for better monitoring of nutrition status trends, and implementation of both nutrition sensitive and nutrition specific programmes. Given the recurrent food deficit during hunger gap periods, encourage partners to support periodic annual SMART surveys in specific districts of intervention especially during the lean seasons to provide timely data for monitoring and any

early warning signs. Continue the 3-year periodic national nutrition SMART surveys to provide with data on nutrition situation and assess the progress towards global, regional and national commitments to eliminate hunger in the country.

- The communities need to be trained on sanitation and maintenance of the water systems in order to address the issues of limited access to safe water. Provision of sanitary facilities including building of latrines at household level in settled populations or at strategic locations in the bomas/villages for appropriate disposal of human excretal waste. This should be coupled with awareness on the need to use such facilities.

- Initiate and maintain programmes for treatment and prevention of the emerging overweight and obesity in adults such as behaviour change communication (BCC) for adoption and maintenance of lifestyle behaviors contributing to both dietary intake and physical activity.

**Table 1.** *Summary of SLNNS 2017 Results*

| Indicator | SLNNS, Sep-Oct 2017 | | |
|---|---|---|---|
| | **n** | **%** | **95% CI** |
| **Anthropometric Results based on WHO 2006 Standards (N=8993)** | | | |
| Prevalence of Global Acute Malnutrition, GAM (WHZ<-2 and/or oedema), N=8974 | 455 | 5.1 | 4.6 – 5.6 |
| Prevalence of Moderate Acute Malnutrition, GAM (WHZ>=-3 and <-2) | 362 | 4.0 | 3.6 - 4.5 |
| Prevalence of Severe Acute Malnutrition, SAM (WHZ<-3 and/or oedema) | 93 | 1.0 | 0.8 – 1.3 |
| Mean Weight-for-Height Z Score (WHZ) | -0.10 | ± 1.11 | -0.13– -0.07 |
| Bilateral Oedema | 6 | 0.1 | 0.0 – 0.1 |
| Prevalence of Global Acute Malnutrition based on MUAC (MUAC<125mm and/or oedema), N=8993 | 238 | 2.6 | 2.3 – 3.1 |
| Prevalence of Moderate Acute Malnutrition based on MUAC (MUAC>=115mm and <125mm) | 182 | 2.0 | 1.7-2.4 |
| Prevalence of Severe Malnutrition based on MUAC (MUAC<115mm and/or oedema) | 56 | 0.6 | 0.5 – 0.8 |
| Mean Mid-Upper Arm Circumference (MUAC in mm) | 150.6 | ± 18.7 | 150.1 – 151.1 |
| Prevalence of stunting (HAZ<-2), N=8961 | 2803 | 31.3 | 30.0-32.6 |
| Prevalence of moderate stunting (HAZ>=-3 and <-2) | 1910 | 21.3 | 20.3-22.3 |
| Prevalence of severe stunting (HAZ<-3) | 893 | 10.0 | 9.2-10.7 |
| Mean Height-for-Age Z Score (HAZ) | -1.41 | ±1.29 | -1.45– -1.37 |
| Prevalence of underweight (WAZ<-2), N=8984 | 1221 | 13.6 | 12.8-14.5 |
| Prevalence of moderate underweight (WAZ>=-3 and <-2) | 946 | 10.5 | 9.8-11.3 |
| Prevalence of severe underweight (WAZ<-2) | 275 | 3.1 | 2.7-3.5 |
| Mean Weight-for-Age Z Score (WAZ) | -0.86 | ±1.08 | -0.89– -0.83 |
| **Mortality Results (Retrospective in 90 days prior to survey), N=8959** | | | |
| CDR (Total deaths/10,000 people/day) | | 0.19 | 0.15-0.24 |
| U5DR (Deaths in U5 children /10,000 U5 children /day | | 0.16 | 0.10-0.27 |
| **Child Morbidity in two weeks prior to survey (N=9069)** | | | |
| Prevalence of reported illness (6-59 months) | 2007 | 22.1 | 20.3-24.0 |
| Type of illnesses (N=2007): | | | |
| Fever | 1506 | 75.0 | 71.7-78.4 |
| Cough | 717 | 35.7 | 31.7-39.8 |
| Diarrhea | 127 | 6.3 | 3.7-9.0 |
| Other illnesses (skin, eye infections, etc) | 379 | 18.9 | 15.7-22.1 |
| **Health Programmes (N=9069)** | | | |
| Children (9-59 months) immunized against measles: | | | |
| No | 1973 | 21.8 | 18.9-24.7 |
| Yes, with EPI card | 5313 | 58.6 | 55.1-62.1 |
| Yes, by recall | 1171 | 12.9 | 10.5-15.3 |
| Child <9 months | 612 | 6.7 | 6.2-7.3 |
| | | | |

| | | | |
|---|---|---|---|
| Children who received vitamin A supplement | 7278 | 80.3 | 77.6-82.9 |
| Children who slept under net (LLITN) last night | 8471 | 93.4 | 92.1-94.7 |
| Proportion (12-59 months) dewormed in the last 6 months (N=7876) | 5445 | 69.1 | 65.9-72.3 |
| **IYCF (IYCF) Practices (N=4550)** | | | |
| Proportion of children (0-23 months) ever breastfed | 4507 | 99.1 | 98.7-99.4 |
| Proportion currently breastfeeding | 4011 | 88.2 | 86.9-89.5 |
| Proportion fed on colostrum (N=1106) | 892 | 80.7 | 76.7-84.6 |
| Proportion Exclusive Breast Feeding (N=1106) | 681 | 61.6 | 58.0-65.1 |
| Proportion bottle feeding | 1058 | 23.3 | 20.9-25.6 |
| Timely initiation of breastfeeding (with 1 hr of birth) | 2585 | 56.8 | 52.8-60.9 |
| Continued breastfeeding at 1 year (12-15 months) [N=510] | 432 | 94.5 | 92.2-96.8 |
| Timely introduction of complementary feeding (6-8 months) [N=426] | 234 | 55.2 | 49.4-61.0 |
| Proportion meeting minimum dietary diversity (6-23 months) [N=3444] | 1023 | 29.7 | 26.6-32.8 |
| Proportion meeting minimum meal frequency (6-23 months) [N=3444] | 1518 | 44.1 | 41.2-46.9 |
| **Women Nutrition Status (N=9480)** | | | |
| Acute Malnutrition by MUAC in PLWs (N=2770) | 157 | 5.7 | 4.8-6.6 |
| Acute Malnutrition by MUAC in non PLWs (N=6710) | 10 | 0.1 | 0.0-0.2 |
| Acute Malnutrition by BMI in non PLWs (N=6712) | 345 | 5.1 | 4.5-5.8 |
| Proportion of overweight women (BMI=25.0-29.9) | 1236 | 18.4 | 17.3-19.5 |
| Proportion of oobese women (BMI=>30) | 502 | 7.5 | 6.7-8.3 |
| Proportion meeting minimum dietary diversity for women (MDD-W), N=9496 | 6494 | 68.4 | 65.4-71.4 |
| **WASH Results (N=9467)** | | | |
| Access to safe water source (Borehole, protected well/spring) | 6491 | 68.6 | 64.8-72.3 |
| Take recommended time (<30 minutes) to collect water (including queuing time): | 7411 | 78.3 | 75.3-81.2 |
| Appropriate treatment method (boiling, chlorination) | 164 | 5.5 | 2.7-8.1 |
| Mean amount of water (litres) used by household/day | 82.5 | ±57.3 | 79.1-85.9 |
| Optimal (adequate) water use (15L/person/day) | 5821 | 61.5 | 58.6-64.4 |
| Access to sanitation facility (latrine/toilet) | 1879 | 19.8 | 16.9-22.8 |
| Hand washing at (at least 3) critical times: | 2899 | 30.6 | 27.0-34.2 |
| Hand washing with soap | 6813 | 72.0 | 68.9-75.0 |
| **Food Security Results (N=9469)** | | | |
| Household's main source of income: | | | |
|     Sale of crops/farm produce | 3298 | 34.8 | 31.5-38.2 |
|     Petty trading | 1393 | 14.7 | 13.2-16.2 |
|     Skilled labour | 1315 | 13.9 | 11.9-15.8 |
|     Salaried work | 850 | 9.0 | 7.6 – 10.3 |
| Household's main source of staple food: | | | |
|     Purchases | 6373 | 67.3 | 63.8-70.8 |
|     Own production | 2683 | 28.3 | 25.1-31.6 |
|     Work for food/Labour exchange | 110 | 1.2 | 0.7-1.6 |

| | | | |
|---|---|---|---|
| Households that own livestock | 3834 | 40.5 | 37.3-43.7 |
| Households that cultivated in the current season | 4543 | 48.0 | 44.4-51.6 |
| Households that experienced some shock in the previous one year | 1768 | 18.7 | 16.4-21.0 |
| Households that applied at least one coping strategy in the previous 30 days | 2019 | 21.3 | 18.7-24.0 |
| Mean Reduced Coping Strategy Index (rCSI) | 3.2 | ±7.3 | 2.7 – 3.6 |
| Level of coping strategies applied (rCSI) | | | |
| No or low (rCSI<4) | 7560 | 79.8 | 77.2-82.4 |
| Medium (rCSI of 4-9) | 520 | 5.5 | 4.2-6.8 |
| High (rCSI ≥10) | 1389 | 14.7 | 12.5-16.9 |
| Mean Household Hunger Scale (HHS) | 0.7 | ±1.2 | 0.6 – 0.8 |
| Level of household hunger experienced (HHS) | | | |
| None or light | 7329 | 77.4 | 74.5-80.2 |
| Moderate | 1993 | 21.0 | 18.4-23.7 |
| Severe | 147 | 1.6 | 0.7-2.4 |
| Mean household dietary diversity score (HDDS) in past 24 hours | 5.3 | ±2.3 | 5.1 - 5.5 |

# 1.    INTRODUCTION

## 1.1    General Background

Sierra Leone is located on the West Coast of Africa and covers an area of about 72,000 square kilometers (28,000 square miles). It extends from latitude 7 degrees north to 10 degrees north, and from longitude 10 degrees west to 14 degrees west. The country is bordered by the Republic of Guinea on the north and northeast, and the Republic of Liberia on the east and southeast; while the Atlantic Ocean extends approximately 340 kilometers (211 miles) on the west and southwest (Fig 1).

**Figure 1: Map of Sierra Leone showing geographic location and the district administrative units**
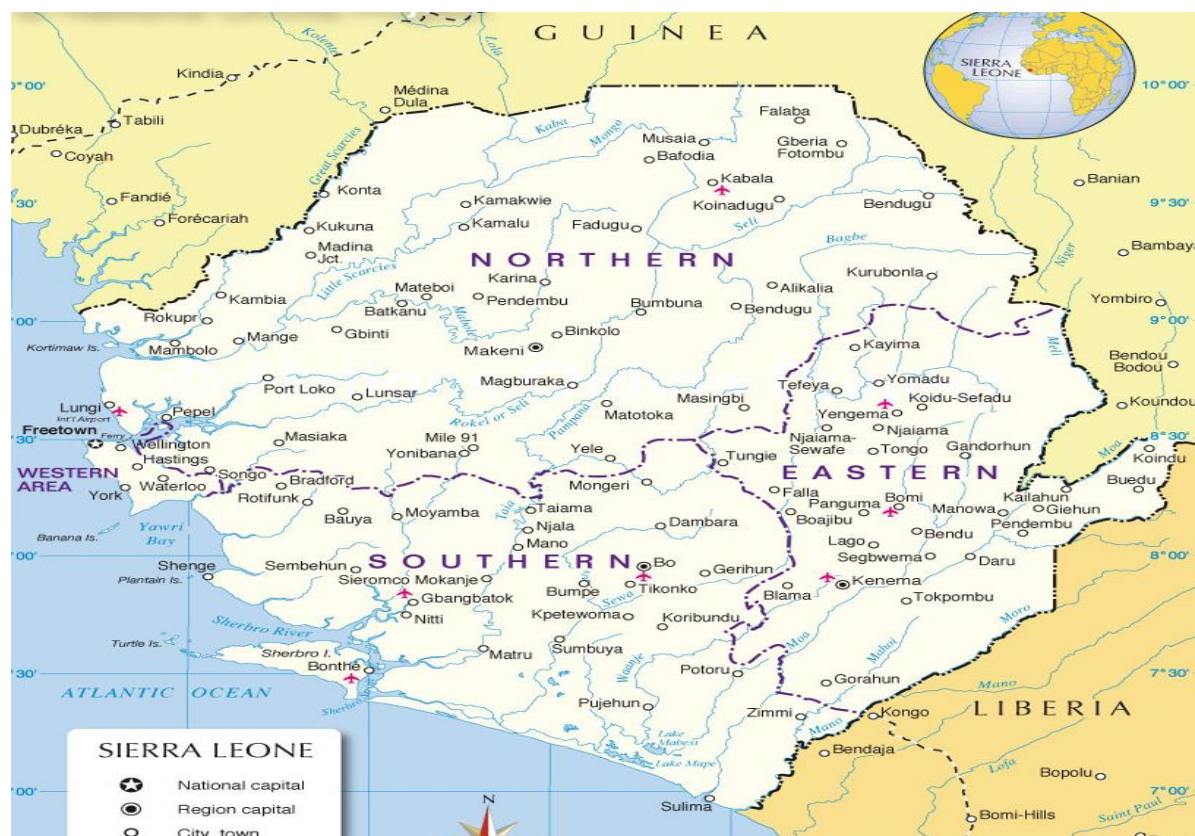


Sierra Leone has a total population of 7,092,113 (3,601,135 females and 3,490,178 males) of which 4,187,016 (59%) live in the rural and 2,905,097 (41%) live in the urban areas[2]. The average annual growth rate between 2004 and 2015 is 3.2 percent with the total fertility rate (TFR) is estimated at 5.2 children per woman. Characteristic of a young demography, 40.9% of the population are children (below 15 years old), 55.6% are a working age (15-64 years old) and only 3.5% are aged 65 years and above.

Administratively, Sierra Leone is divided into four regions. Each region is sub-divided into districts, and each district is divided into chiefdoms and wards for Western Urban and Rural Area. Overall,

---

[2] 2015 Population and Housing Census (PHC, 2015)

there are 14 districts subdivided into 149 chiefdoms and 12 wards based on the 2015 population and census data[3]. Among the 14 districts, there are five city councils and 14 district councils, including Freetown, the capital, total of 19 local councils (SSL, 2006). Sierra Leone has four main physical regions: the Freetown Peninsula has raised beaches and hills, the Coastal Plains, the Interior Lowlands, and the Interior Plateau. The Freetown Peninsula consists of three roughly parallel ranges of highlands that are narrow but extend about 30 kilometers south of Freetown.

The country experiences two main seasons: the dry season, between November and May, and the wet/ rainy season, from April/May to November.

The economy of Sierra Leone is predominantly agricultural, which has accounted for about half of the real gross domestic product (GDP). Coffee, cocoa, and fish are the major agricultural exports of the country. According to the African Development Bank economic outlook, Sierra Leone has achieved modest economic growth rates in the post-war period that peaked at 20.7% in 2013 with the launching of the government's Agenda for Prosperity 2013-18 (A4P). The economy is recovering from the twin shocks of: i) unprecedented decline in international iron ore prices starting in late 2013; and ii) the outbreak of Ebola Virus Disease (EVD) in 2014, and real GDP growth recovered from 21.1% in 2015 to 4.3% in 2016 (ADB, 2017). The continued double-digit gross domestic product (GDP) growth resulted from resumption in iron ore production combined with government investment in infrastructure (construction, electricity) as well as buoyant activities in agriculture, tourism and services. Sierra Leone is essentially a supply-constrained mono-cultural economy depending on a few commodities for output and export. Following these shocks, the authorities, in very close partnership with donors and other stakeholders, prioritized the country's immediate strategic interventions in the context of the Post-Ebola Recovery Plan (PERP), which is a refocusing of the A4P as launched in late 2015. With nominal GDP projected at SLL 22.69 trillion in 2016 (IMF projection of USD 4.289 billion for 2016), Sierra Leone is the 154th economy in the world and 38th in Africa but offering significant business opportunities.

According to the International Food Policy Research Institute (IFPRI), Sierra Leone with Global Hunger Index (GHI) of 38.3 in 2017 scores among the highest in the global rating of 119 countries with sufficient data, signifying Alarming levels (GHI 35-49.9) of hunger (IFPRI, 2017)[4].

In 2014 to 2015, Sierra Leone experienced the world's most widespread Ebola Virus Disease (EVD) outbreak along with neighboring countries Guinea and Liberia. The Ebola outbreak had negative impact on health and socioeconomic situation of the populations, particularly the most vulnerable, presenting a high rate of under-five mortality (156 deaths per 1,000 live births). However, as no comprehensive assessments had been carried out in the country, this remains an assumption linked to the pre-existing weak health system and the indirect consequences of the emergency status declared for the first time in August 2014. In particular, the high rates of infections occurring in the first phase of the EVD outbreak. The quarantine measures adopted by the Government of Sierra Leone (GoSL) to limit the spread of the disease, and the closure of the markets have contributed to an initial disruption in the provision of basic health services and a loss of trust in the health system by the communities. Also loss in livelihood and an overall increase in the rates of food insecurity. Furthermore, the Human Development Report 2016

---

[3] The GOSL has since added 2 new districts making a total of 16 districts. However, 14 districts of the 2015 PHC data were used in this survey.

[4] GHI calculated for four indicators: 1) the percentage of the population that is undernourished, 2) the percentage of children under age five who suffer from wasting (low weight for height), 3) the percentage of children under age five who suffer from stunting (low height for age), and 4) the percentage of children who die before the age of five (child mortality).

indicates that women were disproportionately affected by the Ebola outbreak; they faced higher risks of infection because of their role in caring for the sick. As a result, their essential maternal health uptake reduced notably in antenatal, perinatal and postnatal care. Nutrition indicators in Sierra Leone showed improvement in comparison with 2010 and 2014 Standardized Monitoring and Assessment of Relief and Transitions (SMART) survey results prior to Ebola crisis.

## 1.2     Justification

In order to assess the impact of the various interventions designed in addressing the high prevalence of malnutrition, especially stunting levels, evaluate progress towards Sustainable Development Goals (SDGs 2030); and to monitor the nutritional status of specific population groups in Sierra Leone. The first national nutrition survey was conducted in 2010 and the second in 2014 using SMART methodology. Therefore, the Government of Sierra Leone (GoSL) led by the Ministry of Health & Sanitation (MoHS) and its partners planned to conduct the third National Nutrition Survey (NNS) using SMART Methodology. The current survey would enhance comparison of results given the use of standard study design, timing of the nutrition surveys, indicators assessed and data analysis including analysis of trends. The Directorate of Food and Nutrition Security (DFNS) at MoHS conducts SMART surveys at regular times at the same period every two-three years to obtain data across timelines and therefore enable trend analysis. The implementation of national nutrition survey using SMART methodology is known to enhance the quality, validity and reliability of survey data generated and ultimately enable for comparison and efficient prioritization and targeting of interventions and resources.

The NNS 2017 also assessed the severity and geographical distribution of contextual factors associated with malnutrition. Furthermore, the study findings provide the platform for policy and strategy development to prioritize the programs for short, medium and long-term direct and indirect interventions at the national and district level. Results from this survey would further complement the just concluded Multiple Indicator Cluster Survey (MICS) 2017 and contribute to the National Nutrition Information System (NNIS) for strengthened surveillance of the nutrition situation in the country. The NNIS also uses Integrated Management of Acute Malnutrition (IMAM) program data, community level screening data and other sources of quantitative and qualitative data from government and partners to provide up-to-date information on the nutrition situation in the country. The information on nutrition, mortality, infant & young child feeding and associated factors would allow for improved program planning and monitoring for better maternal & child survival outcomes.

## 1.3     Nutrition Context

### 1.3.1   Sources of Nutrition Information

Nutrition SMART surveys provide the main sources of reliable nutrition information at district and national levels. Desk review of secondary data was mainly based the NNS 2010 and NNS 2014 reports. Other sources of national nutrition indicators have been the MICS 2010, Demographic, and Health Survey (DHS) 2013. The National Nutrition Information System (NNIS) is another source of nutrition information. NNIS provides surveillance data on IMAM program and community level nutrition screening. Other sources such as the Census Report 2015 provided information on the demographic and livelihood context of the country.

### 1.3.2   Nutrition Situation in the country: Secondary Review

According to the NNS 2014, the national prevalence[5] of global acute malnutrition (GAM) was 4.7% (4.3 – 5.2 95% CI) and the severe acute malnutrition (SAM) rate was 1% (0.9 – 1.2 95% CI). These results indicate "*acceptable*" acute nutrition situation based on WHO classification for severity levels of acute malnutrition. However, Stunting rate was still moderately high at 28.8% (27.5 – 30.2 95% CI). Some districts reported GAM rates above 5% threshold indicating nutrition situation at *Poor* levels according to WHO classification; these were Pujehun (5.0%), Moyamba (5.0%), Kenema (5.5%), Port Loko (5.5%), and Tonkolili (6.6%).

The rates of stunting varied by district with half of the districts reporting rates above the *high* level of >30% such as Kono (30.1%), Port Loko (32.2%), Bombali (33.3%), Moyamba (34.5%), Kenema (39.6%), Pujehun (41.0%) and Tonkolili (41.2%).

The national prevalence of both GAM and stunting rates have been showing an improving trend since 2008 assessment, with GAM rates reducing from 10.9% in 2008, 6.9% in 2010 to 4.7% in 2014; and stunting rates reducing from 37.4% in 2008, 34.1% in 2010 to 28.8% in 2014. The trends have been reflected at the level of districts as well, and it was expected that this trend would hold in the current NNS 2017.

According to the UNICEF Conceptual framework, the causes of malnutrition is multifaceted and is associated with poor food consumption/ dietary diversity and high morbidity burden in less favourable environments aggravated by poor  IYCF practices, livelihood shocks, water and sanitation. The improvements in the nutrition situation can thus be attributed to the national IMAM program and supportive treatment programs and associated WASH, food security and livelihood interventions by DFNS, line ministries and national NGOs with support from international UN and NGO partners.

---

[5] Covering all districts except two – Kailahun and Bonthe.

## 2      OBJECTIVES

### 2.1      Overall Objective

The overall objective of the Sierra Leone National SMART Survey (SLNSS) 2017 was to determine and evaluate the current nutrition status of the population (especially children 6-59 months old and women of reproductive age (15-49 years of age) and the retrospective mortality rate in the population at national and district levels. The major contextual factors contributing to malnutrition such as IYCF, Food Security, WASH and Health situation in Sierra Leone were also assessed in order to define program-planning priorities for direct and indirect nutrition interventions.

### 2.2   Specific Objectives

1. To determine prevalence of acute malnutrition among children 6-59 months to estimate of acute and chronic malnutrition (global acute malnutrition, underweight and stunting) at the national level and in the 14 districts of Sierra Leone.
2. To assess maternal nutrition status in Women of Reproductive Age (15-49 years old) at the national level and in the 14 districts[6] of Sierra Leone.
3. To assess coverage of access to key primary health care services for child survival outcomes at the national level and in the 14 districts of Sierra Leone.
4. To assess two- week retrospective morbidity among children 6-59 months at the national level and in the 14 districts of Sierra Leone.
5. To assess retrospective mortality (Crude Mortality and U5 Mortality rates) over 3 months recall period among populations at the national level and in the 14 districts of Sierra Leone.
6. To assess other contextual factors contributing to malnutrition such as Food Security, Dietary Diversity for Women and WASH at the national level and in the 14 districts of Sierra Leone.
7. To assess levels of Infant and Young Child (IYCF) practices among mothers/primary caregivers of 0-23 months old children in Sierra Leone.

---

[6] Western Area Urban, Western Area Slums, Western Area Rural; Kono, Kenema, Kailahun; Bo, Pujehun, Moyamba, Bonthe; Kambia, Port Loko, Koinadugu, Tonkolili, and Bombali.

## 3.    METHODOLOGY

### 3.1    Study Design

The NNS 2017 mainly employed a cross-sectional design using the Standardized Monitoring and Assessment of Relief and Transition (SMART) methodology. This methodology provides a basic integrated method for assessing nutritional status and mortality rate as well as other associated factors including food security, morbidity, health programs, and WASH hence providing the basis for understanding the magnitude and severity of nutrition situation in the 14 districts to be assessed and among the populations of the Western Area slums.

### 3.2    Study Population

The SLNNS 2017 targeted primarily mothers or women in the reproductive age (15-49 years) and children less than five years for household interviews and measurement. The following definitions applied for the sake of this study:

- A household is defined as a group of people who routinely eat out of the same pot and live on the same compound (or physical location). It is possible that they will live in different structures. Sharing the pot is the unifying factor for households.
- Definition of HH head: is member of the family who manages the family resources and decisions (He/She is the final decision maker on most of the decision related to income allocation and major family activities).
- Respondent is the mother or caregiver in the household.

### 3.3    Sampling

#### 3.3.1    Sampling Strategy

A two-stage cluster sampling approach was applied in the NNS 2017, to select sampling units at different levels (clusters and households) in each district.

#### 3.3.2    Sample Size Calculation

The sample size for nutrition, mortality and IYCF were determined by using the July 9th 2015 updated version of ENA for SMART (2011), by entering all the required data in the planning menu of the ENA delta software. The data entered into the software included estimated prevalence of global acute malnutrition (GAM) and crude death rate (CDR), desired precision, design effect (DEFF), average household size based on the most recent 2015 census data, percentage of under five children (in the 6-59 months for anthropometry and 0-23 months for IYCF), non-response rate and recall period. July 16th, the *Day of the African Child* was taken as the beginning of the recall period for the 3 months retrospective mortality assessment. Prevalence of GAM and CDR and other parameters were estimated from the NNS 2014 for each district. ***The software (ENA) calculated the sample size based on the formula below:***

$$N = \frac{[Z^2 \text{x p}(p-1)\text{xDeff}]/[1-\text{NRR}]}{d^2}$$

where;

| | |
|---|---|
| N: | is the total sample size |
| Z: | is the normal deviate (confidence limit) taken as 1.96 at 95% confidence level |
| p: | proportion of global acute malnutrition (GAM) in the study population |
| d: | is the acceptable degree of accuracy (precision) desired |
| Deff: | Design effect |
| NRR: | Non-response rate (expected) |

The 95% Confidence Interval (CI) for prevalence (proportions) was computed in ENA using the formula:

$$95\% \text{ CI } (\widetilde{p}) \quad = \quad \widetilde{p} \pm Z \sqrt{\frac{\widetilde{p}(1-\widetilde{p})}{\widetilde{n}}}$$

**Table 2: Sample size calculation for anthropometric, mortality and IYCF surveys**

| Province | District | | Prevalence 2014 | Precision | DE | NRR | % children | Mean HH size | Sample children | Sample HHs | No of clusters (20 HHs/cluster) | No of RCs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Western | Urban | Anthropometry | 1.9 | 1.7 | 1.5 | 5 | 18.4 | 4.6 | 405 | 559 | | |
| | | Mortality | 0.18 | 0.17 | 1.11 | 5 | | 4.6 | 2559 | 585 | 28 | 4 |
| | | IYCF (0-23 mo) | 99.7 | 1.4 | 1.5 | 3 | 9.7 | 4.6 | 96 | 552 | | |
| | Slums | Anthropometry | 4.8 | 2 | 1.6 | 3 | 24.4 | 6.8 | 764 | 528 | | |
| | | Mortality | 0.32 | 0.27 | 1.5 | 3 | | 6.8 | 2437 | 369 | | |
| | | IYCF (0-23 mo) | 97.8 | 2.5 | 1.5 | 3 | 12.2 | 6.8 | 216 | 670 | 34 | 4 |
| | Rural | Anthropometry | 2.3 | 1.7 | 1.5 | 3 | 19.6 | 4.9 | 488 | 582 | | |
| | | Mortality | 0.43 | 0.3 | 1.58 | 3 | | 4.9 | 2794 | 588 | | |
| | | IYCF (0-23 mo) | 98.4 | 2.9 | 1.5 | 3 | 9.8 | 4.9 | 117 | 630 | 31 | 4 |
| Eastern | Kono | Anthropometry | 4.5 | 2.2 | 1.5 | 3 | 15.8 | 5.9 | 557 | 684 | | |
| | | Mortality | 0.85 | 0.41 | 1.5 | 3 | | 5.9 | 3339 | 583 | | |
| | | IYCF (0-23 mo) | 98.8 | 2.4 | 1.5 | 3 | 7.9 | 5.9 | 129 | 713 | 36 | 5 |
| | Kailahun | Anthropometry | 4.7 | 2 | 1.5 | 3 | 19.1 | 6.3 | 702 | 669 | 33 | 4 |
| | | Mortality | 0.36 | 0.26 | 1.5 | 3 | | 6.3 | 3516 | 575 | | |
| | | IYCF (0-23 mo) | 99.2 | 2 | 1.5 | 3 | 8.5 | 6.3 | 124 | 598 | | |
| | Kenema | Anthropometry | 5.5 | 2.5 | 1.5 | 3 | 16.1 | 5.5 | 522 | 675 | | |
| | | Mortality | 0.35 | 0.28 | 1.5 | 3 | | 5.5 | 2948 | 553 | | |
| | | IYCF (0-23 mo) | 95.0 | 4.9 | 1.5 | 3 | 8.0 | 5.5 | 124 | 726 | 36 | 5 |
| Southern | Pujehun | Anthropometry | 4.0 | 2 | 1.5 | 3 | 19.1 | 6.7 | 602 | 539 | | |
| | | Mortality | 0.29 | 0.26 | 1.5 | 3 | | 6.7 | 2563 | 394 | | |
| | | IYCF (0-23 mo) | 92.1 | 6 | 1.5 | 3 | 8.5 | 6.7 | 127 | 573 | 29 | 4 |
| | Bonthe* | Anthropometry | 4.7 | 2.1 | 1.5 | 3 | 19.1 | 6.2 | 637 | 616 | | |
| | | Mortality | 0.36 | 0.26 | 1.5 | 3 | | 6.2 | 3182 | 529 | | |
| | | IYCF (0-23 mo) | 80.9 | 8.5 | 1.5 | 3 | 8.5 | 6.2 | 134 | 656 | 33 | 4 |
| | Bo | Anthropometry | 4.3 | 2.1 | 1.5 | 3 | 22.1 | 5.6 | 585 | 542 | | |
| | | Mortality | 0.23 | 0.21 | 1.5 | 3 | | 5.6 | 3116 | 574 | | |
| | | IYCF (0-23 mo) | 91.9 | 5.8 | 1.5 | 3 | 11.0 | 5.6 | 139 | 580 | 29 | 4 |
| | Moyamba | Anthropometry | 4.4 | 2.2 | 1.5 | 3 | 20.7 | 5.1 | 499 | 541 | | |
| | | Mortality | 0.29 | 0.25 | 1.5 | 3 | | 5.1 | 2772 | 560 | | |
| | | IYCF (0-23 mo) | 98.9 | 2.4 | 1.5 | 3 | 10.3 | 5.1 | 118 | 581 | 29 | 4 |
| Northern | Kambia | Anthropometry | 6.5 | 2.7 | 1.5 | 3 | 17.6 | 6.4 | 523 | 532 | | |
| | | Mortality | 0.63 | 0.35 | 1.37 | 3 | | 6.4 | 3387 | 546 | | |
| | | IYCF (0-23 mo) | 93.9 | 5.4 | 1.5 | 3 | 8.8 | 6.4 | 123 | 563 | 28 | 4 |
| | Port Loko | Anthropometry | 6.7 | 2.8 | 1.5 | 3 | 19.0 | 5.5 | 500 | 548 | | |
| | | Mortality | 0.41 | 0.32 | 1.55 | 3 | | 5.5 | 2983 | 559 | 28 | 4 |
| | | IYCF (0-23 mo) | 98.8 | 2.6 | 1.5 | 3 | 9.5 | 5.5 | 110 | 542 | | |
| | Koinadugu | Anthropometry | 4.1 | 2.1 | 1.5 | 3 | 14.8 | 7.3 | 559 | 593 | | |
| | | Mortality | 0.7 | 0.40 | 1.5 | 3 | | 7.3 | 3155 | 445 | | |
| | | IYCF (0-23 mo) | 88.6 | 6.4 | 1.5 | 3 | 7.4 | 7.3 | 155 | 737 | 37 | 5 |
| | Tonkolili | Anthropometry | 5.3 | 2.3 | 1.5 | 3 | 19.7 | 6.1 | 595 | 567 | | |
| | | Mortality | 0.14 | 0.139 | 1.15 | 3 | | 6.1 | 3319 | 561 | | |
| | | IYCF (0-23 mo) | 99.6 | 1.25 | 1.5 | 3 | 9.8 | 6.1 | 160 | 689 | 34 | 4 |
| | Bombali | Anthropometry | 6.8 | 2.7 | 1.5 | 3 | 18.2 | 5.7 | 545 | 602 | | |
| | | Mortality | 0.46 | 0.32 | 1.4 | 3 | | 5.7 | 3023 | 547 | | |
| | | IYCF (0-23 mo) | 92.3 | 6 | 1.5 | 3 | 9.1 | 5.7 | 124 | 615 | 31 | 4 |
| | | **Total** | | | | | | 5.6 | 8,483 | 9,546 | 477 | 63 |

Notes:

1. Used National Average from 2014 as these were Ebola affected*
2. With 17 teams, data collection would require minimum of 32 days.
* The largest of the three sample sizes is taken

Taking, the largest of the sample sizes, 507-746 households are required in each district to be assessed in the integrated SMART assessment. Based on the number of households, and the minimum number of clusters (25) recommended for a SMART survey, there were 28-37 clusters per district to cover in 32 days, assuming each team can interview 20 HHs in a day. To enhance measurement of IYCF indicators with high precision, IYCF analysis for some indicators would be aggregated at the national level.

### 3.3.3   Cluster Selection

Upon compilation of the sample sizes and number of clusters required, the cluster sampling with probability proportionate to size (PPS) design was employed for the survey based on SMART guidelines. In the first stage, the Statistics Sierra Leone (SS) selected between 32-42 clusters or Enumeration Areas (EAs) per district from an updated list of population data (2015 Census) for the targeted geographical areas of study (Annex F) using probability proportionate to size (PPS) strategy. Based on ENA guidelines, the number of clusters includes a 10% plus 1 replacement clusters (RCs) reserved in each district to be visited in case a critical number (10%) of the targeted clusters (52-67) are not reachable during data collection for some unavoidable reasons, which the teams would have to seek approval from the SMART consultant/national coordination team. Statistics Sierra Leone also provided the maps for each of the EAs to aid in identifying their locations.

### 3.3.4   Household Selection

In the second stage, households would be selected in the field using simple random sampling (SRS) techniques after population listing. In the randomly selected enumeration areas/localities, the survey teams did contact the local leadership/elder who helped in the segmentation (if large – more than 100 households in the rural or 200 in the urban area) and listing the households within the village/segment, from which a list of households was generated to form a cluster. After completing the list of all households (HHs) in a cluster, twenty households were then be selected for quantitative survey by folding papers with all the households, shuffling and randomly picking the required number. Concensus was reached beforehand that a neutral party such as the chief/community guide would do the picking so that they feel part of the exercise and understand that the households that would be selected are random; Twenty (20) households were picked randomly and interviewed per cluster.

## 3.4     Conceptual Framework

The NNS 2017 design for indicators, tools and analysis is based on the UNICEF Conceptual Framework of Malnutrition (Fig 2.) below

**Figure 2: UNICEF Conceptual Framework of Malnutrition**
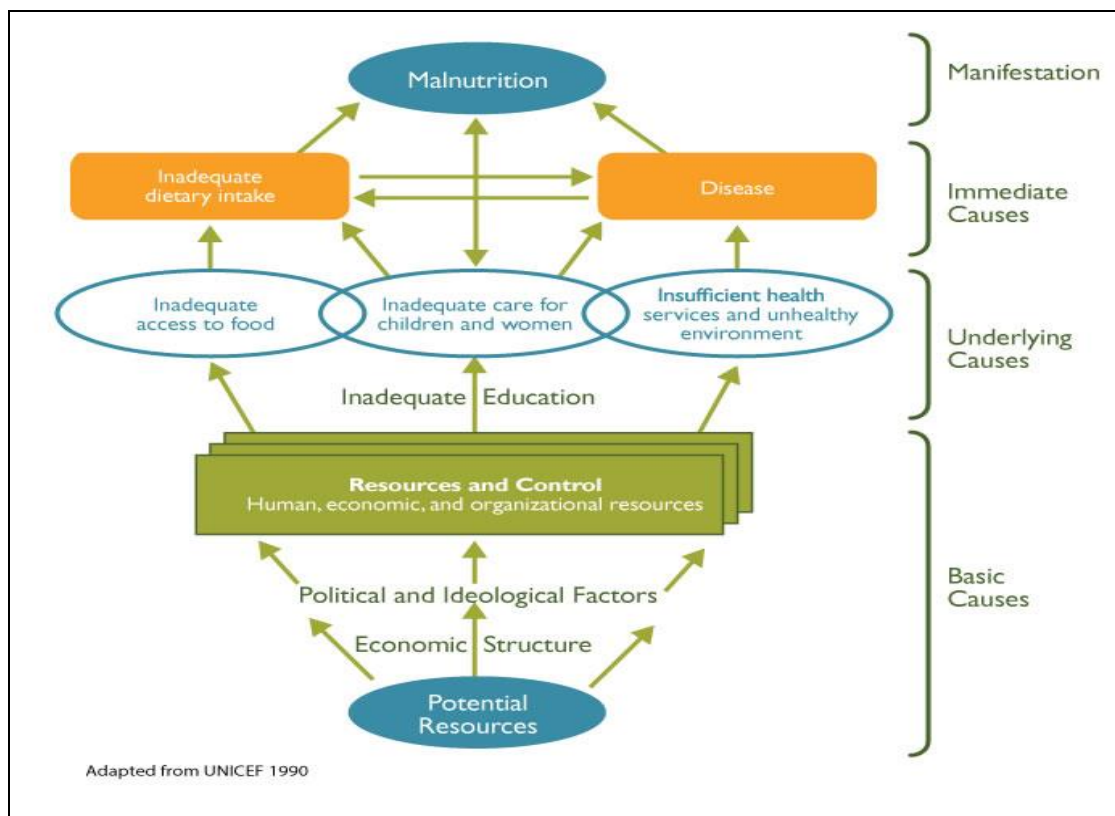


The framework underpins the immediate and underlying factors associated with malnutrition and that was collected in the survey.

## 3.5     Study Tools

Structured and semi structured questionnaires were used to conduct household interview (Household Quantitative Tool – Annex A); this includes Food Security & Livelihood Questionnaires and WASH questionnaire. Data on child anthropometry, morbidity, health and IYCF were collected in the respective anthropometry and IYCF questionnaires (Annex B) while mortality data was collected using the demography & mortality questionnaire (Annex C). Maternal health and nutrition and minimum dietary diversity for women (MDD-W) questionnaires was used to collect the suggested data on women of the reproductive age (15-49 years). For standardization and ease of interpretation and in- and inter-country comparizons, the questions have been adopted from local tools to mirror the indicators collected in 2014, and with addition of MDD-W and framed in such away that they are consistent with international studies and methodologies such as DHS/HHS, and MICS protocols. The tools have been peer-reviewed by the members of the nutrition technical working group (TWG), AAH technical support team and

different stakeholders, and comments incorporated into the final protocol by the consultant. The final questionnaires have been programmed in Open Data Kit (ODK v1.10.1) and forms downloaded into the tablets (SMART mobile phones) for enumerators.

The survey tools thus cover indicators from several sections including:

1) Mortality and demography (household srtucture)
2) Child anthropometry
3) Morbidity, Immunization & Health Seeking Behaviours of child
4) IYCF
5) Household Food Consumption and Dietary Patterns
6) Shocks and coping strategies
7) WASH
8) Women Anthropometry and
9) Minimum Dietary Diversity for Women

### 3.6    Field Data Collection Procedures

Survey teams adhered to this protocol of procedures during data collection in the field.

#### 3.6.1   Social mobilization

The DFNS sent official communication to the district health authorities, District Medical Officers (DMOs) one week ahead of the field survey. The team supervisors were also provided with letters of introduction explaining the ongoing national survey as an important national activity. The authorities would then work closely with the district and community social mobilizers and the survey teams to broadcast and communicate the information in their areas of jurisdiction in preparation of the teams' arrival at the villages/localities.  The teams were also provided with AAH_SL T-shirts and vehicles with AAH (the organization supporting the SMART survey) markings for ease of identification by the community.

At the community level, the supervisor presented and introduced the team to the local leader/chief, who would then assist them identify a community leader/guide to lead them through the village/locality.

#### 3.6.2   Consent Process

At the household, the survey teams would present themselves to a responsible adult member of the household (not a guest). In this survey, the primary respondent is the mother or caregiver of the child or the person responsible for food preparation on the recall day. After introductions of the team members, the supervisor (team leader) would briefly explain to the respondent the purpose of their study, who has funded/supported it, how the data would be gathered, the expected duration of the interview and how the findings of the study would be used. Prior to the interview, a verbal consent was obtained from the respondent, an adult member of the household. This was indicated on the Cluster Control Form, documenting the non-response households as well.

#### 3.6.3   Team Selection and Composition

The survey team members were selected from the NNS database comprising of DFNS staff, district nutritionists, staff from the Statistics Sierra Leone and other persons who have participated

in previous similar surveys.Totla number of seventy three (73) persons proposed for recruitment were trained and after a pre-test, standardization exercise and post-test evaluation during the training; 68 members were selected to serve as supervisors, team leaders and enumerators, leaving 5 persons on standby. The selection of team members and constitution of teams was based on knowledge of English and a local language spoken in the districts to assess (*Krio, Mende, Temne, Loko, Limba, etc*), previous experience in similar studies/assessments, and physical fitness. The team composition also took into account gender balance by having at least a woman in the team for ease of handling the interviews with respondents as well as the children.

A total number of 17 teams undertook the fieldwork. Each team consisted of four (4) members – a supervisor, team leader, and two (2) nutrition enumerators in addition to the village/field guide. Based on the length of the household questionnaires and the long distances expected in the field, each team interviewed twenty (20) households per cluster in a day. In the late stages of data collection in Western Urban Area, the DFN recalled back seven (7) nutritionists who doubled as supervisors and replaced them with nutritionists from national office. The consultant offered quick training for the new team before they were deployed to the field; the team also had previous SMART survey experience so the replacement did not affect quality of data collected in Western Urban.

The NNS 2017 coordination team of five members led by the SMART consultant, 2 persons from the DFN, 1 staff from AAH-SL and 1 from WFP coordinated and oversee the data collection and field management through the team supervisors.

### 3.6.4   *Team Training & Pretesting*

Training of the SLNNS 2017 teams was conducted at the Armed Forces Educational Center (AFEC) in Freetown. The survey teams received training on basic package for SMART methodology for 6 days between Monday 28th August and Saturday 2nd September, including a standardization test and field pretesting exercise in the last two days respectively. The training covered the following key topics: Review of the objectives and scope of the nutrition survey including anthropometric measurements (height/length, weight and MUAC measurement techniques with emphases on taking accurate measurements). Practical lessons to evaluate enumerators' ability to measure accuracy; interview techniques; assessment of health status of the child (illness); immunization and mortality data; sampling procedures; data recording procedure and quality controls; handling of equipment; and the general courtesy during the assessment.

The SMART consultant from AAH led the training with assistance of two other MoHS staff – Kadiatu Fofana and Mutivah Kappia who had received SMART managers training in Ghana in 2013. The training used power point presentations, discussions, Q&A sessions, Quizzes, role-plays and practical sessions.

Standardisation exercise was conducted at the training venue for the 17 pair of enumerators with the trainers assisting in the set-up and organization of the stations and supervisors assisting in management of the teams. Standardization exercise is a pre-survey practice recommended by SMART methodology and involves repeated measurements of weight, height and MUAC for 10 children between 1 and 5 years by each of the enumerators. Pre-testing of the questionnaire and equipment was carried out in 34 households (each team interviewing 2 households) in *Lakka* villages in the outskirts of Freetown, which are not part of the actual assessment.

### 3.6.5  *Interviews and Measurements*

Interviews were conducted by the enumerators who have been trained on the type of data to be collected by each specific question/item, the reason the data is collected and how; reading verbatim from the questionnaire in the tablet. Interviews would require a private set-up as is allowable within the respondent's homestead. Children's ages, if they do not have birth registration documents, were estimated to the nearest month using an appropriate local events calendar (Annex D) enriched for each district. Where the question requires single response, the responses had been coded and programmed to select one response and so the exact response from the respondent; and where there are possible multiple responses, the application would allow more than one box to be checked. The application has also enabled programming of special filters for questions such that only questions that are supposed to follow a suitable response would appear.

Household estimates as proportions of income and food source, expenditures, etc was done using proportional piling techniques. Anthropometric measurements were done according to the SMART guidelines using electronic scales for weight in kg (to the nearest 1 decimal place). Rigid height boards for height (for both child and woman) or length in cm (to the nearest 1 decimal place) and MUAC tape (for child and adult) for Mid-Upper Arm Circumference in cm (to the nearest 1 decimal place). Children less than 24 months (or below 87 cm) was measured lying down for length while children 24-59 months (or 87 cm and above) was measured for standing height as recommended in the SMART guidelines.

## 4.       DATA MANAGEMENT PLAN

### 4.1      Data Collection

In order to collect data quickly and in real time, 4-5 teams worked in a district at a time (i.e. 4 districts at a time). This was conducted in 6 weeks and started on 6th September such that the bulk of data collection would be completed by 30th September, except for Western urban, slums and rural areas that spilled over to October 10th. Data was collected and captured using ODK built xls forms developed by the consultant and downloaded into the tablets.

### 4.2      Data Processing and Analysis Plan

Since, the mobile phones/tablets were used for data capturing, anthropometric data was uploaded daily or every other day depending on access to internet and analyzed using SMART recommended software ENA (Delta Version 2011 and latest update of July 9, 2015). Anthropometric data was reviewed by the supervisor every day for completeness of the questionnaire, plausibility of measurements and identification of any cases of malnutrition that would require referral in line with SMART guidelines. In order to enhance data quality control and allow the supervisor to provide feedback to the teams and to the coordinators the supervisor recorded the day's work on the cluster control form and upload the finalized forms/data to the server as soon as they access internet. The anthropometric and other data was merged into the meta-data set in other formats such as EPI Info and SPSS for integrated analysis. Analysis was undertaken in Freetown using both ENA and EPI Info in the second and third week of October by the consultant.

Rates of malnutrition and mortality were generated in ENA software, while further analysis that include frequency distributions to derive the prevalence of various food security, nutrition and health indicators and mean/median distributions were derived for continuous variables. The analysis was done separately for each district and weighted rates generated for global aggregated data for the national rates.

### 4.3      Data Quality Control

The data quality control began right from the questionnaire design all through to the processing and cleaning stage. Quality of data was ensured through: (i) adequate training (ii) monitoring of fieldwork by coordination team, (iii) crosschecking of filled questionnaires on daily basis; recording of observations; confirmation of disease outbreaks; severe malnutrition and oedema cases by team leaders. All households sampled were visited and recorded including empty houses; (iv) daily review with the teams to address any difficulties encountered; (v) progress evaluation according to the time schedule and progress reports shared among the coordination team on regular basis. Continous data entry (vi); cleaning and plausibility checks in ENA for SMART; (vii) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights and (viii) continuous reinforcement of good practices such as good probing, accuracy of measurements taken, shouting of measurements by both the enumerators reading and recording them.

## 5.    SURVEY COORDINATION & MANAGEMENT

### 5.1    Study Coordination

The study was managed by the National SMART Survey National Coordination and Management Committee derived from Technical Working Group (TWG) that constitute members from key agencies including Ministry of Health and Sanitation, UNICEF WHO, WFP, Hellen Keller, FAO, and MoH/DFN among others. Under the leadership of the director Aminata Shamit Koroma, MoH/DFN would appoint a focal person to represent it on the National Coordination and Management Committee (NCMC) for the study.

The national survey is led by a consultant recruited by Action Against Hunger (AAH), with strong SMART survey and analysis capabilities and experience in SMART surveys. He was complemented by a team of local Action Against Hunger experts and personnel from the government and partner agencies with variable experience and skills. The MoHS and Action Against Hunger provided the overall coordination support in logistics and community mobilization. The survey team consisted of 17 teams, a coordination team of 5 persons working closely with 17 supervisors, 1 supervisor assigned to each team.

**Figure 3: SLNNS 2017 Organogram**

```
┌─────────────────────────────────────────────┐
│  Sierra Leone National SMART Survey          │
│  Technical Working Group (SLNNS-TWG)         │
└─────────────────────────────────────────────┘
                      │
                      │                ┌──────────────────────────┐
                      ├────────────────│  Agency TWG members      │
                      │                │  and Focal Persons       │
                      │                └──────────────────────────┘
          ┌───────────────────────┐
          │  1 National           │
          │  Coordinator/MoHS     │
          └───────────────────────┘
                      │
          ┌───────────────────────────┐
          │  Lead Survey Consultant/ AAH │
          └───────────────────────────┘
                      │
   ┌──────────────────────────────────┐    ┌──────────────────────────────────────┐
   │ 1 National Coordinator Field/DFN │    │ 1 National Coordinator Freetown/DFN  │
   │ 1 National Coordinator Field (AAH)│   │ 1 National Coordinator Freetown/AAH  │
   │ 1 National Coordinator Field (WFP)│   └──────────────────────────────────────┘
   └──────────────────────────────────┘
```

| Supervisor Team 1 | Supervisor Team 2 | Supervisor Team 3 | Supervisor Team 4 | Supervisor Team n (...17) |
|---|---|---|---|---|
| **Team 1**<br>• 1 Team Leader<br>• 2 Enumerators | **Team 2**<br>• 1 Team Leader<br>• 2 Enumerators | **Team 3**<br>• 1 Team Leader<br>• 2 Enumerators | **Team 4**<br>• 1 Team Leader<br>• 2 Enumerators | **Team n (17)**<br>• 1 Team Leader<br>• 2 Enumerators |

### 5.2     Logistics & Management

Action Against Hunger facilitated the drafting of budgets, contracts for the consultant and the survey teams and logistics for the team training and field work including sourcing for the equipment, tablets, vehicles, training venue and refreshments besides communication and operational costs during the field work. AAH also organized consultant's meeting with TWG/stakeholders. The DFNS facilitated the identification and recruitment of survey teams, release and assigning of the government staff/nutritionists to undertake the survey, coordination of the teams during training and fieldwork, social mobilization and general policy and operational guidance to the exercise. Each team was asigned a 4X4 vehicle, a set of anthropometric equipment (electronic weighing scale, height board, and MUAC tapes), WHZ charts, Local Events Calendar, Cluster Control Forms, Referral Forms, copy of letter of introduction, list of clusters and 2 tablets.

### 5.3     Partners Participation

The DFNS/MoHS and SS have largely been involved in the implementation of this survey from GoSL side. MOHS has provided personnel and guidance for the survey and SS provided staff, sampling for clusters and maps for the EAs. AAH with financial support from the Irish Aid is the main technical partner for the SLNNS 2017 with technical back up from Action Against Hunger Nutrition Technical Advisors from Paris. WFP provided two cars for (besides one staff to the coordination team) for data collection while UNICEF provided the anthropometric equipment and Statistics Sierra Leone provided sampling for clusters and maps for the EAs. Significant contributions also came from other members of TWG in form of tablets (Focus 1000 and WHO), planning and review of the objectives and tools.

## 6.        SURVEY RESULTS

### 6.1    Demographic Characteristics of the Survey Population (households and children)

A total number of 10,175 children aged of 0-59 months were assessed in the Sierra Leone National Nutrition Survey 2017. Of these 9069 children (4486 boys and 4573 girls), aged 6-59 months were assessed for anthropometry and morbidity in the 15 districts/units nationally.  IYCF information was collected among 4550 children (0-23 months) of which 1106 were under 6 months (0-5 months) and assessed for exclusive breastfeeding practices. The survey covered a total number of 9,469 households of which 8959 households responded to mortality questionnaire. The mean household size was 4.5 (±1.9). Most of the assessed households were residents (97.2%) while a few households were returnees (1.4%) and IDPs (1.4%). Most of the households were male-headed (82.3%), but still a significant proportion of the households were female-headed (17.7%).

The distribution of the assessed children by age and sex among the younger (6-29 months) and older (30-59 months) shows that the younger were slightly oversampled (p<0.05), although the overall ratio (ratio: 0.99) was still within the acceptable range (value should be around 0.85). Boys and girls were equally represented (ratio: 1.0) as expected (Table 3).

**Table 3: Distribution of age and sex of sample**

| AGE (mo) | Boys | | Girls | | Total | | Ratio |
|---|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | % | Boy:girl |
| 6-17 | 1147 | 49.7 | 1163 | 50.3 | 2310 | 25.5 | 1.0 |
| 18-29 | 1070 | 48.5 | 1138 | 51.5 | 2208 | 24.4 | 0.9 |
| 30-41 | 1067 | 48.8 | 1120 | 51.2 | 2187 | 24.1 | 1.0 |
| 42-53 | 884 | 51.0 | 850 | 49.0 | 1734 | 19.1 | 1.0 |
| 54-59 | 318 | 51.3 | 302 | 48.7 | 620 | 6.8 | 1.1 |
| Total | 4486 | 49.5 | 4573 | 50.5 | 9059 | 100.0 | 1.0 |

The presence of younger children than their older counterparts is possibly an error occurring from age estimation in the population in which a significant proportion of home deliveries and events were registered later at the health facilities by mother's recall or where birth records are not available. Analysis flagged a number of age measurement errors even where exact birth dates from child cards were recorded. From the plausibility report, seven percent of children had no exact birthday.

## Figure 4: Population age and sex pyramid
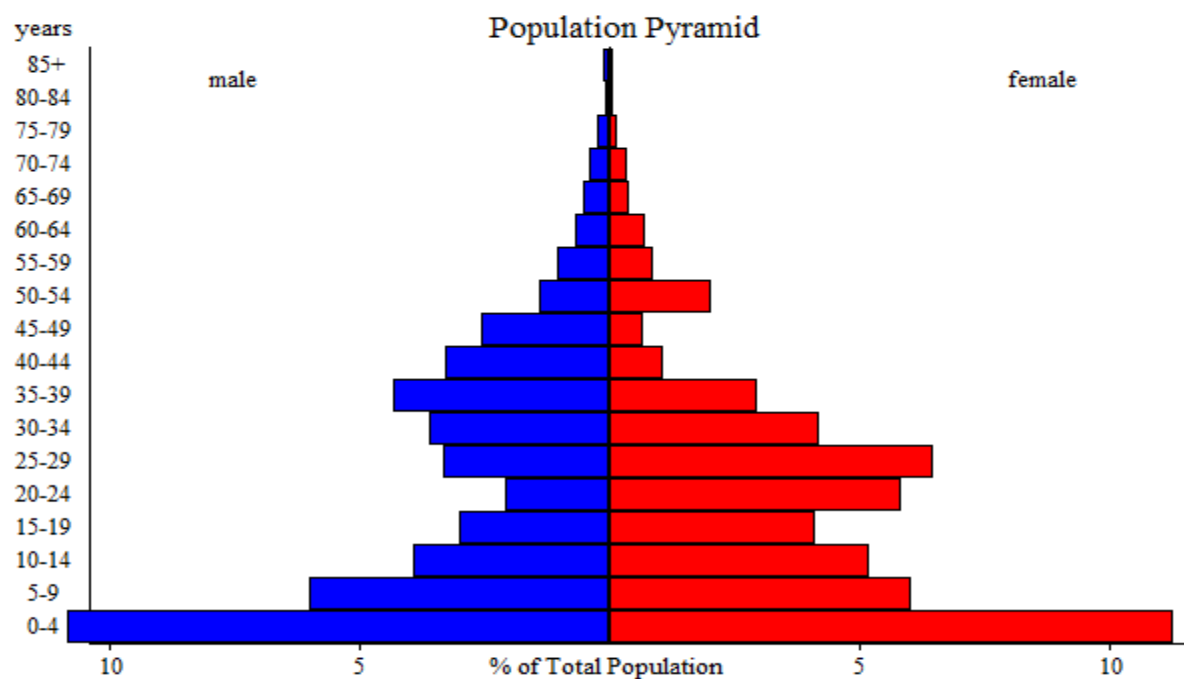


## Table 4: Response Rate and Geographic Coverage of the SLNNS 2017

| Province | District | Households | | | Total Population (Mortality) | | Total Children | | Children (0-23 mo) | | % Children U5s | | Mean HH Size | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sampled | Assessed | Response Rate | Sampled | Assessed | Sampled | Assessed | Sampled | Assessed | Sampled | Assessed | Planned | Assessed |
| Western | Urban | 585 | 653 | 111.6 | 2559 | 2844 | 405 | 758 | 96 | 315 | 18.4 | 20.6 | 4.6 | 4.7 |
| | Slums | 670 | 553 | 82.5 | 2437 | 2097 | 764 | 691 | 216 | 335 | 24.4 | 30.2 | 6.8 | 3.9 |
| | Rural | 630 | 642 | 101.9 | 2794 | 2478 | 488 | 709 | 117 | 321 | 19.6 | 26.5 | 4.9 | 4.0 |
| Eastern | Kono | 713 | 723 | 101.4 | 3339 | 3560 | 557 | 781 | 129 | 329 | 15.8 | 18.9 | 5.9 | 5.3 |
| | Kailahun | 669 | 656 | 98.1 | 3516 | 2684 | 702 | 728 | 124 | 271 | 19.1 | 19.3 | 6.3 | 4.3 |
| | Kenema | 726 | 669 | 92.1 | 2948 | 2364 | 522 | 612 | 124 | 309 | 16.1 | 26.2 | 5.5 | 3.8 |
| Southern | Pujehun | 573 | 709 | 123.7 | 2563 | 2351 | 602 | 759 | 127 | 338 | 19.1 | 29.6 | 6.7 | 4.3 |
| | Bonthe | 656 | 612 | 93.3 | 3182 | 2199 | 637 | 600 | 134 | 299 | 19.1 | 22.7 | 6.2 | 3.9 |
| | Bo | 580 | 560 | 96.6 | 3116 | 2300 | 585 | 628 | 139 | 274 | 22.1 | 23.4 | 5.6 | 4.5 |
| | Moyamba | 581 | 580 | 99.8 | 2772 | 2831 | 499 | 637 | 118 | 286 | 20.7 | 21.2 | 5.1 | 4.8 |
| Northern | Kambia | 563 | 548 | 97.3 | 3387 | 2543 | 523 | 613 | 123 | 300 | 17.6 | 16.2 | 6.4 | 5.3 |
| | Port Loko | 559 | 548 | 98.0 | 2983 | 2238 | 500 | 575 | 110 | 250 | 19.0 | 20.1 | 5.5 | 5.4 |
| | Koinadugu | 737 | 759 | 103.0 | 3155 | 3128 | 559 | 764 | 155 | 347 | 14.8 | 20.1 | 7.3 | 4.7 |
| | Tonkolili | 689 | 639 | 92.7 | 3319 | 2536 | 595 | 743 | 160 | 332 | 19.7 | 25.2 | 6.1 | 4.5 |
| | Bombali | 615 | 618 | 100.5 | 3023 | 2446 | 545 | 577 | 124 | 124 | 18.2 | 16.8 | 5.7 | 4.6 |
| National | | 9,546 | 9,469 | 99.2 | 45,093 | 38,599 | 8,483 | 10,175 | 1,996 | 4550 | 19.1 | 22.1 | 5.6 | 4.5 |

The 2017 SMART survey covered 15 statistical (14 districts plus 1) domains countrywide, including the two districts of Bonthe and Kailahun that were not accessed in 2014 (Fig. 6.2).

A total number of 9,469 households out of planned 9,546 households were assessed, indicating coverage of 99.2% from 477 clusters countrywide. The calculated number of households (sample size) were covered apart from a few districts. In Port Loko district, fewer households were assessed due to high percentage of non-response rate caused by absenteeism in a few clusters that fell among migrant port workers, who also reportedly had split families staying in Freetown. In Kailahun and Bonthe that were not assessed in 2014, the national prevalence and parameters were used in sample size determination and as it turned out, these were probably over-estimates for both children assessed for nutrition and population reached for mortality. Other discrepancies could have arisen out of some degree of selection bias but also out of actual demographic and migration dynamics since the 2014 Ebola Crisis and 2015 Census in the country as seen in differences in the parameters (such as average household size, proportion of underfive, etc) used in the planning stage and those from the findings. The proportion of children under five years per household was 22.1%, i.e. per 0.99 children per household assessed for a household size of 4.5 nationally. Table 4 shows the survey coverage and response rates.

**Figure 5: Map of Data Submission Points Showing Coverage in SLNNS 2017**
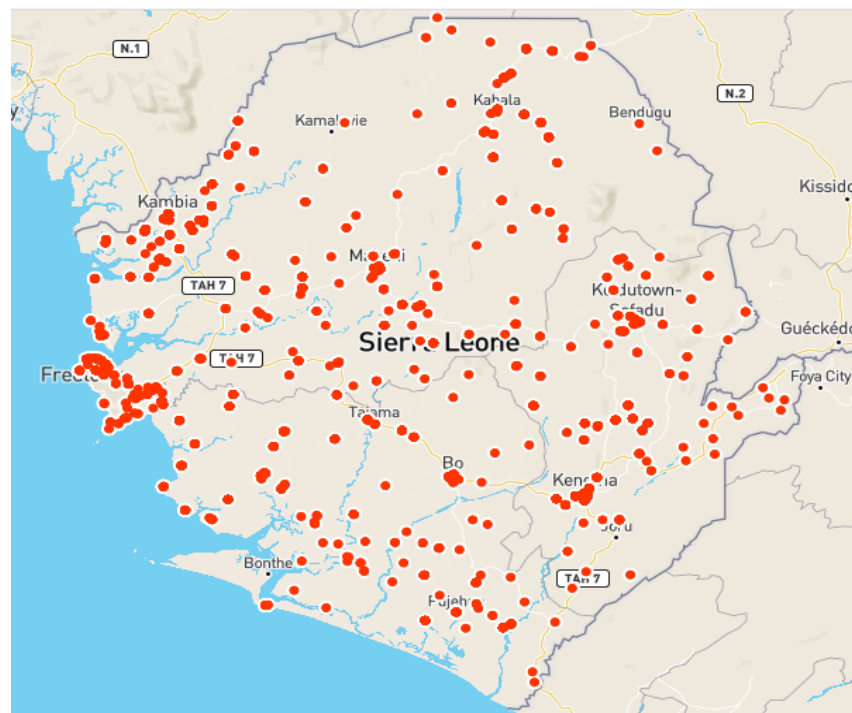
## 6.2    Child Nutrition Status (Anthropometric Results)

### 6.2.1    Prevalence of acute Malnutrition based on Weight-for-Height Z scores (WHZ)

The national prevalence of Global Acute Malnutrition (GAM) defined as Weight-for-height Z scores (WHZ<-2 and/or oedema) rate for Sierra Leone was **5.1%** (95% CI: 4.6-5.6). Moderate acute malnutrition (MAM) defined as WHZ≥-3 and ≤-2 was 4.0% (95% CI: 3.6-4.5) and the severe acute malnutrition (SAM) defined as WHZ<-3 and/or oedema rate was **1.0%** (95% CI: 0.8-1.3). Six oedema cases (0.1%) were observed during the assessment (Table 5). A higher proportion of boys (6.1%; 95%CI: 5.4-6.9) was more acutely malnourished than girls (4.1%; 95%CI: 3.5-4.7; *p*<0.05). The findings indicate a ***poor*** nutrition situation (GAM rate of 5-9.9%) according to WHO classification.

**Table 5**: Prevalence of acute malnutrition based on weight-for-height z- score and/or oedema by sex

|  | **All** (n = 8974) | **Boys** (n = 4441) | **Girls** (n = 4533) |
|---|---|---|---|
| Prevalence of global malnutrition (<-2 z-score and/or oedema) | (455) 5.1 % (4.6 - 5.6 95% C.I.) | (271) 6.1 % (5.4 - 6.9 95% C.I.) | (184) 4.1 % (3.5 - 4.7 95% C.I.) |
| Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no edema) | (362) 4.0 % (3.6 - 4.5 95% C.I.) | (217) 4.9 % (4.3 - 5.6 95% C.I.) | (145) 3.2 % (2.7 - 3.7 95% C.I.) |
| Prevalence of severe malnutrition (<-3 z-score and/or edema) | (93) 1.0 % (0.8 - 1.3 95% C.I.) | (54) 1.2 % (0.9 - 1.6 95% C.I.) | (39) 0.9 % (0.6 - 1.2 95% C.I.) |
| The prevalence of oedema is 0.1 % | | | |

**Table 6**: Prevalence of Global, Moderate and Severe Acute Malnutrition in Children (6-59 months) based on WHZ Scores by District

| Province | District | Global Acute Malnutrition (GAM) [WHZ<-2 and/or edema] | | | | Moderate Acute Malnutrition (MAM) [-3≤WHZ≤-2 and no edema] | | | Severe Acute Malnutrition (SAM) [WHZ<-3 and/or edema] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | n | % | 95% CI | n | % | 95% CI | n | % | 95% CI |
| Western | Urban | 721 | 42 | 5.8 | 4.1-8.1 | 35 | 4.9 | 3.2-7.3 | 7 | 1.0 | 0.5-2.1 |
| | Slums | 605 | 33 | 5.5 | 3.6-8.2 | 29 | 4.8 | 3.3-7.0 | 4 | 0.7 | 0.2-2.0 |
| | Rural | 609 | 22 | 3.6 | 2.2-5.9 | 19 | 3.1 | 1.8-5.2 | 3 | 0.5 | 0.2-1.6 |
| Eastern | Kono | 732 | 34 | 4.6 | 2.8-7.6 | 27 | 3.7 | 2.3-5.8 | 7 | 1.0 | 0.4-2.5 |
| | Kenema | 631 | 36 | 5.7 | 3.9-8.3 | 29 | 4.6 | 3.1-6.7 | 7 | 1.1 | 0.6-2.2 |
| | Kailahun | 532 | 17 | 3.2 | 1.9-5.3 | 14 | 2.6 | 1.6-4.3 | 3 | 0.6 | 0.2-1.8 |
| Southern | Pujehun | 647 | 31 | 4.8 | 3.6-6.4 | 24 | 3.7 | 2.5-5.4 | 7 | 1.1 | 0.5-2.4 |
| | Bo | 528 | 30 | 5.7 | 3.8-8.3 | 19 | 3.6 | 2.2-5.8 | 11 | 2.1 | 1.1-4.0 |
| | Moyamba | 561 | 24 | 4.3 | 2.9-6.2 | 22 | 3.9 | 2.7-5.7 | 2 | 0.4 | 0.1-1.4 |
| | Bonthe | 558 | 23 | 4.1 | 2.6-6.4 | 16 | 2.9 | 1.7-4.9 | 7 | 1.3 | 0.6-2.6 |
| Northern | Kambia | 515 | 29 | 5.6 | 4.1-7.7 | 26 | 5.0 | 3.7-6.9 | 3 | 0.6 | 0.2-1.8 |
| | Port Loko | 518 | 30 | 5.8 | 4.1-8.1 | 21 | 4.1 | 2.7-6.0 | 9 | 1.7 | 0.9-3.3 |
| | Koinadugu | 628 | 36 | 5.7 | 4.2-7.7 | 28 | 4.5 | 3.2-6.2 | 8 | 1.3 | 0.6-2.6 |
| | Tonkololi | 650 | 36 | 5.5 | 3.9-7.8 | 26 | 4.0 | 2.6-6.2 | 10 | 1.5 | 0.8-2.9 |
| | Bombali | 539 | 32 | 5.9 | 3.9-8.9 | 27 | 5.0 | 3.2-7.9 | 5 | 0.9 | 0.3-3.0 |
| National | | 8,974 | 455 | 5.1 | 4.6-5.6 | 362 | 4.0 | 3.6-4.5 | 93 | 1.0 | 0.8-1.3 |

GAM rates varied from acceptable (GAM rate <5%) to unacceptable levels (GAM rates>5%). Game rates, acceptable (<5%) were recorded in: Kailahun (3.2% 95%CI: 1.9-5.3); Western Area Rural (3.6%; 95%CI: 2.2-5.9); Bonthe (4.1%; 95%CI: 2.6-6.4); Moyamba (4.3%; 95%CI: 2.9-6.2), Kono (4.6%; 95% CI: 2.8-7.6), and Pujehun (4.8%; 95%CI: 3.6-6.4). GAM rates, unacceptable (>5%) were recorded in: Tonkolili (5.5%; 95% CI: 3.9-7.8);  Western Area Slums (5.5%; 95%CI: 3.6-8.2);  Kambia (5.6%; 95% CI: 4.1-7.7);  Bo (5.7%; 95% CI: 3.8-8.3); Kenema (5.7%; 95%CI: 3.9-8.3); Koinadugu (5.7%; 95% CI: 4.2-7.7);  Western Area Urban  (5.8%; 95%CI: 4.1-8.1);  Port Loko (5.8%; 95%CI: 4.1-8.1) and Bombali (5.9%; 95% CI: 3.9-8.9). Table 6 shows the distribution of acute malnutrition rates by district.

The overall quality of the survey as evaluated by the ENA software is considered as *good*, with plausibility score of 11%. In the districts, the quality was either excellent (plausibility scores of 0-9%) or good (Plausibility score of 10-15%), with mild penalties meted on age measurements and sample distribution parameters (Table 7).

**Table 7**: **Data Quality Evaluation Report for the SLNNS 2017**

| District | Bias | | | Digit Preference | | | Sample Distribution | | | | Overall Quality | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flags or Missing Values | Sex Ratio | Age Ratio | Weight | Height | MUAC | SD | Skew-ness | Kur-tosis | Poi-sson | Plausibility Score | Quality Level |
| Urban | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | Excellent |
| U.Slums | 0 | 0 | 4 | 0 | 4 | 2 | 0 | 0 | 0 | 1 | 11 | Good |
| Rural | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 6 | Excellent |
| Kono | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | Excellent |
| Kailahun | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 6 | Excellent |
| Kenema | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 5 | Excellent |
| Pujehun | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Excellent |
| Bonthe | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | Excellent |
| Bo | 0 | 2 | 4 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 11 | Good |
| Moyamba | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 5 | Excellent |
| Kambia | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 7 | Excellent |
| Port Loko | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Excellent |
| Koinadugu | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | Excellent |
| Tonkolili | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | Excellent |
| Bombali | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | Excellent |
| National | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | Good |

The distribution curve for WHZ for the sample compared to WHO 2006 standard is presented below (Figure 6). Exclusion of z-scores is computed from Observed mean SMART flags: WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3.

The curve is slightly shifted to the left with mean z-score of -0.10 and standard deviation of 1.11, which indicates that the surveyed population's nutritional status is poorer as compared to the WHO reference population. The standard deviation is within acceptable range of 0.8 to 1.2. The design effect (DEFF) determined was 1.15 which shows homogeneity for WHZ distribution among

the clusters, lower than the DEFF of 1.5 used in the planning for sample size determination for this survey.

**Figure 6**: Distribution of weight-for-height Z Scores
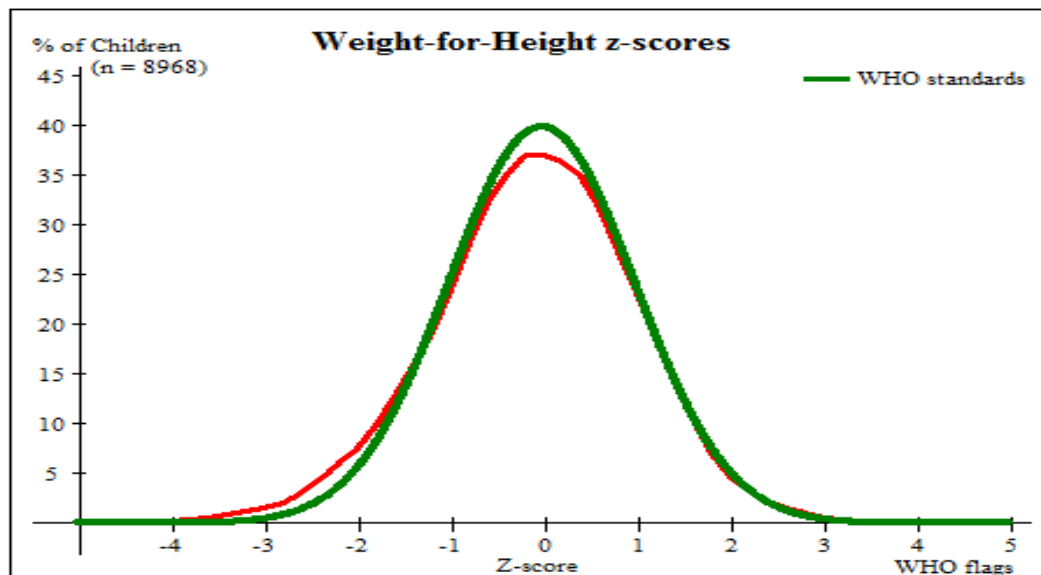


The cases of malnutrition however appeared to be clustered more in certain clusters and districts as indicated by index of dispersion (ID) values for WHZ<-2 (ID=1.12, $p$<0.05) and for WHZ<-3 (ID=1.11, $p$<0.05)[7]. For instance, oedema was reported in only four districts (Kailahun, Koinadugu, Kenema and Port Loko).

The prevalence of acute malnutrition (WHZ<-2 and/or oedema) by age is presented in Table 8 and shows a higher proportion of acutely malnourished among the 6-17 months old children and among the 18-29 months old children. Further analysis showed that prevalence of acute malnutrition was significantly higher among the younger (6-29 months) children (GAM 7.8%; 95%CI: 7.0-8.7) than among the older (30-59 months) children (GAM 2.7%; 95%CI: 2.2-3.1), with younger almost three times more likely to be malnourished (RR=2.922; 95%CI: 2.390-3.572). The difference (p<0.05) in the distribution of acute malnutrition among the younger (6-29 months) and older (30-59 months) age groups is not entire unexpected given this age bracket includes the critical 6-23 months children that are more vulnerable to the risks of poor IYCF practices and associated infections and malnutrition. Table 9 shows the distribution of acute malnutrition based on WHZ and oedema. Six kwashiorkor cases were reported.

---

[7] The Index of Dispersion (ID) indicates the degree to which the cases are aggregated into certain clusters (the degree to which there are "pockets"). If ID has $p$ value between 0.05 and 0.95 the cases are aggregated into certain cluster (there appear to be pockets of cases).

**Table 8**: Prevalence of acute malnutrition by age, based on weight-for-height Z scores and/or oedema

| Age (mo) | Total no. | Severe wasting (<-3 z-score) | | Moderate wasting (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | No. | % | No. | % |
| 6-17 | 2283 | 44 | 1.9 | 175 | 7.7 | 2064 | 90.4 | 0 | 0.0 |
| 18-29 | 2184 | 22 | 1.0 | 95 | 4.3 | 2064 | 94.5 | 3 | 0.1 |
| 30-41 | 2172 | 9 | 0.4 | 53 | 2.4 | 2110 | 97.1 | 0 | 0.0 |
| 42-53 | 1723 | 7 | 0.4 | 26 | 1.5 | 1687 | 97.9 | 3 | 0.2 |
| 54-59 | 612 | 5 | 0.8 | 13 | 2.1 | 594 | 97.1 | 0 | 0.0 |
| Total | 8974 | 87 | 1.0 | 362 | 4.0 | 8519 | 94.9 | 6 | 0.1 |

**Table 9**: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

| | <-3 z-score | >=-3 z-score |
|---|---|---|
| Oedema present | Marasmic kwashiorkor No. 0 (0.0 %) | Kwashiorkor No. 6 (0.1 %) |
| Oedema absent | Marasmic No. 96 (1.1 %) | Not severely malnourished No. 8888 (98.9 %) |

## 6.2.2   Prevalence of acute Malnutrition based on Mid Upper Arm Circumference (MUAC)

As shown in Table 10, the national prevalence of global acute malnutrition based on MUAC (<125mm) and/or oedema was **2.6%** (95% CI: 2.3-3.1), moderate acute malnutrition based on MUAC (MUAC≥115mm and ≤125 mm, and no oedema) was 2.0% (95% CI: 1.7-2.4) and of severe acute malnutrition (MUAC<115mm and/or oedema) was 0.6% (95% CI: 0.5-0.8). Acute malnutrition by MUAC (<125 mm/oedema) was equally distributed among boys (2.4%; 95% CI: 1.9-2.9) and girls (2.9%: 95% CI: 2.4-3.5).

**Table 10**: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

| | All (n = 8993) | Boys (n = 4454) | Girls (n = 4539) |
|---|---|---|---|
| Prevalence of global malnutrition – GAMMUAC (< 125 mm and/or oedema) | (238) 2.6 % (2.3 - 3.1 95% C.I.) | (106) 2.4 % (1.9 - 2.9 95% C.I.) | (132) 2.9 % (2.4 - 3.5 95% C.I.) |
| Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema) | (182) 2.0 % (1.7 - 2.4 95% C.I.) | (76) 1.7 % (1.3 - 2.2 95% C.I.) | (106) 2.3 % (1.9 - 2.8 95% C.I.) |
| Prevalence of severe malnutrition (< 115 mm and/or oedema) | (56) 0.6 % (0.5 - 0.8 95% C.I.) | (30) 0.7 % (0.5 - 1.0 95% C.I.) | (26) 0.6 % (0.4 - 0.8 95% C.I.) |

**Figure 7:** Cumulative distributions of Wasting based on MUAC, SLNNS 2017
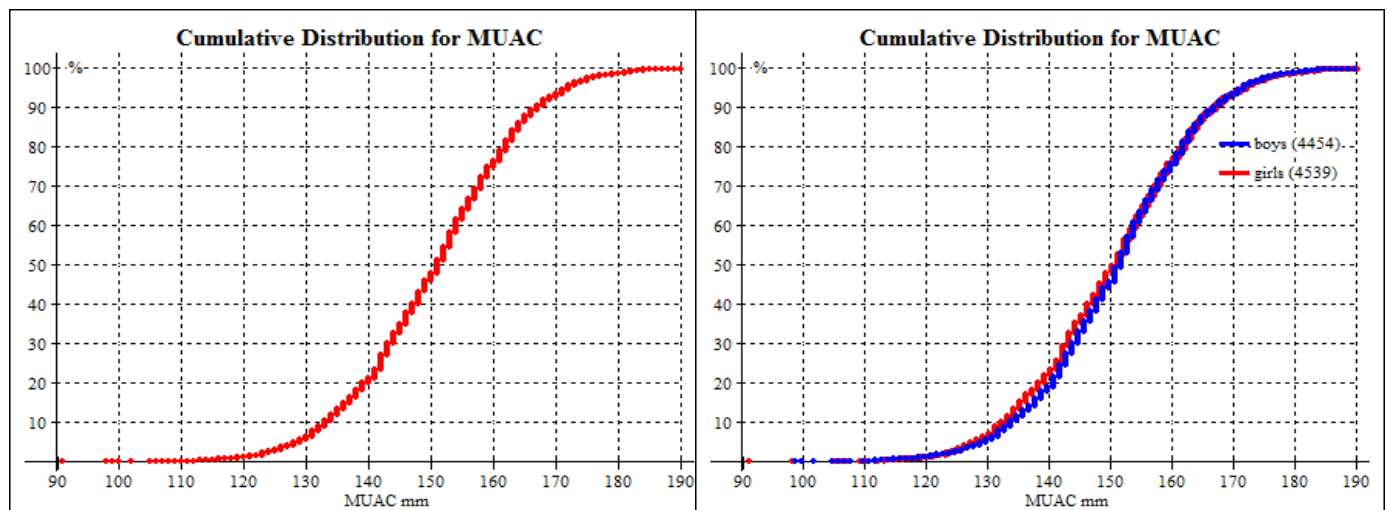


The national cumulative distribution of MUAC (Fig 7) shows a sigmoid curve characteristic of normally distributed population sample with mean MUAC of 150.6 mm and standard deviation of 18.7 mm. The design effect of 1.39 for MUAC<125 mm indicates a fair degree of homogeneity in the distribution of wasted children in the districts and clusters.

The prevalence of acute malnutrition based on MUAC ranged from 1.8% in both Western Area Rural (95% CI: 0.9-3.7) and Bonthe (95% CI: 1.0-3.1) to 4.4% (95% CI: 2.6-7.3) in Port Loko. Table 11 shows the distribution of acute malnutrition based on MUAC by district.

**Table 11**: Prevalence of Global, Moderate and Severe Acute Malnutrition in Children (6-59 months) based on MUAC by District

| Province | District | Global Acute Malnutrition (MUAC<125 mm and/or oedema) | | | | Moderate Acute Malnutrition (MUAC≥115 mm and ≤-125 mm and no oedema) | | | Severe Acute Malnutrition (SAM) (MUAC<115mm and/or odema) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | n | % | 95% CI | n | % | 95% CI | n | % | 95% CI |
| Western | Urban | 721 | 14 | 1.9 | 1.1-3.4 | 10 | 1.4 | 0.7-2.6 | 4 | 0.6 | 0.2-1.5 |
| | U.Slums | 605 | 12 | 2.0 | 1.1-3.5 | 10 | 1.7 | 0.9-3.0 | 2 | 0.3 | 0.1-1.4 |
| | Rural | 613 | 11 | 1.8 | 0.9-3.7 | 7 | 1.1 | 0.5-2.8 | 4 | 0.7 | 0.2-1.8 |
| Eastern | Kono | 732 | 10 | 1.4 | 0.6-3.0 | 8 | 1.1 | 0.4-2.6 | 2 | 0.3 | 0.1-1.1 |
| | Kenema | 631 | 19 | 3.0 | 1.7-5.2 | 13 | 2.1 | 1.0-4.2 | 6 | 1.0 | 0.5-2.0 |
| | Kailahun | 534 | 15 | 2.8 | 1.6-4.8 | 12 | 2.2 | 1.3-4.0 | 3 | 0.6 | 0.2-1.7 |
| Southern | Pujehun | 648 | 25 | 3.9 | 2.5-5.8 | 20 | 3.1 | 2.0-4.8 | 5 | 0.8 | 0.3-1.7 |
| | Bo | 529 | 15 | 2.8 | 1.5-5.3 | 9 | 1.7 | 0.8-3.5 | 6 | 1.1 | 0.5-2.8 |
| | Moyamba | 562 | 14 | 2.5 | 1.3-4.7 | 13 | 2.3 | 1.2-4.5 | 1 | 0.2 | 0.0-1.4 |
| | Bonthe | 558 | 10 | 1.8 | 1.0-3.1 | 6 | 1.1 | 0.5-2.3 | 4 | 0.7 | 0.3-1.9 |
| Northern | Kambia | 516 | 15 | 2.9 | 1.6-5.2 | 10 | 1.9 | 1.1-3.5 | 5 | 1.0 | 0.4-2.2 |
| | Port Loko | 520 | 23 | 4.4 | 2.6-7.3 | 18 | 3.5 | 2.0-5.9 | 5 | 1.0 | 0.4-2.5 |
| | Koinadugu | 633 | 24 | 3.8 | 2.0-6.9 | 19 | 3.0 | 1.6-5.5 | 5 | 0.8 | 0.3-2.2 |
| | Tonkololi | 652 | 21 | 3.2 | 2.0-5.0 | 18 | 2.8 | 1.7-4.6 | 3 | 0.5 | 0.2-1.4 |
| | Bombali | 539 | 10 | 1.9 | 1.0-3.5 | 9 | 1.7 | 0.8-3.3 | 1 | 0.2 | 0.0-1.4 |
| | National | 8,993 | 238 | 2.6 | 2.3-3.1 | 182 | 2.0 | 1.7-2.4 | 56 | 0.6 | 0.5-0.8 |

In all the districts, the prevalence of acute malnutrition by MUAC was lower than prevalence by weight-for-height z scores.

Table 12 shows the national prevalence of acute malnutrition based on MUAC by age. Again a higher proportion of the younger children aged 6-29 months were acutely malnourished using MUAC ($p<0.05$) than the older counterparts (30-59 months).

**Table 12**: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

| | | Severe wasting (< 115 mm) | | Moderate wasting (>= 115 mm and < 125 mm) | | Normal (> = 125 mm ) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| Age (mo) | Total no. | No. | % | No. | % | No. | % | No. | % |
| 6-17 | 2292 | 35 | 1.5 | 126 | 5.5 | 2131 | 93.0 | 0 | 0.0 |
| 18-29 | 2190 | 12 | 0.5 | 49 | 2.2 | 2129 | 97.2 | 3 | 0.1 |
| 30-41 | 2175 | 3 | 0.1 | 3 | 0.1 | 2169 | 99.7 | 0 | 0.0 |
| 42-53 | 1724 | 0 | 0.0 | 6 | 0.3 | 1718 | 99.7 | 3 | 0.2 |
| 54-59 | 612 | 0 | 0.0 | 1 | 0.2 | 611 | 99.8 | 0 | 0.0 |
| Total | 8993 | 50 | 0.6 | 185 | 2.1 | 8758 | 97.4 | 6 | 0.1 |

*6.2.2.1 Age Disaggregated Levels of Wasting in Children 6-59 months based on Weight-for-Height Z scores (WHZ)*

Age disaggregated analysis of global acute malnutrition (GAM) shows that prevalence of wasting of 8.4% (95% CI: 7.4-9.4) among the younger children in the breastfeeding age (6-23 months) was significantly higher than the prevalence of 3.2% (95% CI: 2.7-3.7) among the older children aged 24-59 months (RR=2.62; 95% CI: 2.17-3.16). The SAM prevalence of 1.9% (95% CI: 1.4-2.4) among the younger children was also higher than among the older children with SAM rate of 0.7% (95% CI: 0.4-0.9) [RR=2.87; 95%CI: 1.85-4.44], indicating the higher relative risk of sub-optimal IYCF practices to child undernutrition (Table 13). In both younger and older age groups, GAM (10.3% vs 6.4%) and SAM (2.4% vs 1.5%) rates were significantly higher among boys than among girls with respective RR of 1.61 (1.29-1.99) and 1.63 (1.00-2.65).

**Table 13**: Age Disaggregated wasting among 6-23 months and 24-59 months

| Age group | Sex | N | Global Acute Malnutrition (WHZ<-2 and/or oedema) | | | | Severe Acute Malnutrition (WHZ<-3 and/or oedema) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | n | % | 95% CI | Risk Ratio (RR) | n | % | 95% CI | Risk Ratio (RR) |
| **6-23 months** | M | 1693 | 175 | 10.3 | 8.8-11.9 | | 40 | 2.4 | 1.6-3.1 | |
| | F | 1724 | 111 | 6.4 | 5.3-7.6 | | 25 | 1.5 | 0.9-2.0 | |
| | All | 3417 | 286 | 8.4 | 7.4-9.4 | 1.61 (1.29-1.99) | 65 | 1.9 | 1.4-2.4 | 1.63 (1.00-2.65) |
| **24-59 months** | M | 2760 | 102 | 3.7 | 3.0-4.4 | | 20 | 0.7 | 0.4-1.0 | |
| | F | 2815 | 76 | 2.7 | 2.1-3.3 | | 17 | 0.6 | 0.3-0.9 | |
| | All | 5575 | 178 | 3.2 | 2.7-3.7 | 1.37 (1.02-1.84) | 37 | 0.7 | 0.4-0.9 | 1.20 (0.64-2.24) |
| **Total** | | **8992** | | | | **2.62 (2.17-3.16)** | | | | **2.87 (1.85-4.44)** |

*6.2.2.2 Age Disaggregated Levels of Wasting in Children 6-59 months based on MUAC*

Based on MUAC cut-off (Table 14), the prevalence of GAM and SAM were 5.9% (95% CI: 4.9-6.8) and 1.3% (95% CI: 0.9-1.7) respectively among the 6-23 months and were similarly higher than respective GAM and SAM rates of 0.6% (95% CI: 0.4-0.9) and 0.1% (95% CI: 0.0-0.2) among the 24-59 month olds (RR=9.33; 6.37-13.68).

**Table 14**: Age Disaggregated wasting (based on MUAC) among 6-23 months and 24-59 months

| Age group | Sex | N | Global Acute Malnutrition (WHZ<-2 and/or oedema) | | | | Severe Acute Malnutrition (WHZ<-3 and/or oedema) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | n | % | 95% CI | Risk Ratio (RR) | n | % | 95% CI | Risk Ratio (RR) |
| 6-23 months | M | 1693 | 87 | 5.1 | 4.0-6.3 | | 24 | 1.4 | 0.9-2.0 | |
| | F | 1724 | 113 | 6.6 | 5.3-7.8 | | 20 | 1.2 | 0.6-1.7 | |
| | All | 3417 | 200 | 5.9 | 4.9-6.8 | 0.78 (0.60-1.02) | 44 | 1.3 | 0.9-1.7 | 1.22 (0.67-2.22) |
| 24-59 months | M | 2762 | 18 | 0.7 | 0.3-1.0 | | 4 | 0.1 | 0.0-0.3 | |
| | F | 2819 | 17 | 0.6 | 0.3-0.9 | | 2 | 0.1 | 0.0-0.2 | |
| | All | 5581 | 35 | 0.6 | 0.4-0.9 | 1.08 (0.55-2.13) | 6 | 0.1 | 0.0-0.2 | 2.0 (0.37-11.2) |
| Total | | 8998 | | | | 9.33 (6.37-13.68) | | | | 12.0 (5.1-28.3) |

### 6.2.3    Prevalence of Underweight based on Weight-for-Age Z scores (WAZ)

The national prevalence of children underweight was **13.6%** (95% CI: 12.8-14.5) with 10.5% (95% CI: 9.8-11.3) moderately underweight and 3.1% (95% CI: 2.7-3.5) severely underweight (Table 15). The level of underweight was significantly higher ($p$<0.05) in boys (15.5%; 95% CI: 14.3-16.7 than in girls (11.7%; 95% CI: 10.7-12.8). Table 16 shows the national distribution of underweight by age and Fig. 8 shows the national distributions of WAZ scores.

**Table 15**: Prevalence of underweight based on weight-for-age z-scores by sex

| | All (n = 8984) | Boys (n = 4449) | Girls (n = 4535) |
|---|---|---|---|
| Prevalence of underweight (<-2 z-score) | (1221) 13.6 % (12.8 - 14.5 95% C.I.) | (689) 15.5 % (14.3 - 16.7 95% C.I.) | (532) 11.7 % (10.7 - 12.8 95% C.I.) |
| Prevalence of moderate underweight (<-2 z-score and >=-3 z-score) | (946) 10.5 % (9.8 - 11.3 95% C.I.) | (517) 11.6 % (10.6 - 12.7 95% C.I.) | (429) 9.5 % (8.6 - 10.4 95% C.I.) |
| Prevalence of severe underweight (<-3 z-score) | (275) 3.1 % (2.7 - 3.5 95% C.I.) | (172) 3.9 % (3.3 - 4.5 95% C.I.) | (103) 2.3 % (1.8 - 2.8 95% C.I.) |

**Table 16**: Prevalence of underweight by age, based on weight-for-age z-scores

| Age (mo) | Total no. | Severe underweight (<-3 z-score) | | Moderate underweight (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | No. | % | No. | % |
| 6-17 | 2290 | 99 | 4.3 | 287 | 12.5 | 1904 | 83.1 | 0 | 0.0 |
| 18-29 | 2186 | 93 | 4.3 | 256 | 11.7 | 1837 | 84.0 | 3 | 0.1 |
| 30-41 | 2175 | 49 | 2.3 | 211 | 9.7 | 1915 | 88.0 | 0 | 0.0 |
| 42-53 | 1721 | 19 | 1.1 | 136 | 7.9 | 1566 | 91.0 | 3 | 0.2 |
| 54-59 | 612 | 15 | 2.5 | 56 | 9.2 | 541 | 88.4 | 0 | 0.0 |
| Total | 8984 | 275 | 3.1 | 946 | 10.5 | 7763 | 86.4 | 6 | 0.1 |

**Figure 8**: Distributions of weight-for-age Z scores in Children 6-59 months, SLNNS 2017
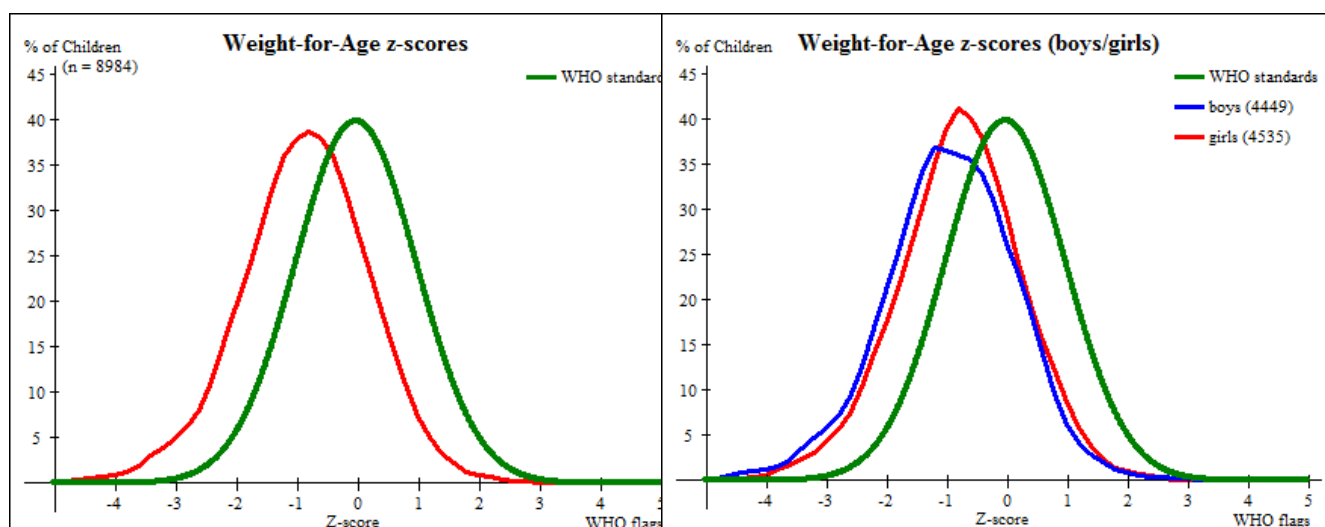


As shown on Table 17, the prevalence of underweight by district ranged from 10.8% (95% CI: 8.3-13.8) in Western Area Rural to 16.8% (95% CI: 13.3-21.0) in Pujehun district.

**Table 17:** Prevalence of National, Moderate and Severe Underweight in Children (6-59 months) based on WAZ Scores by District

| Province | District | Global Underweight (WAZ<-2) | | | | Moderate Underweight (-3≤WAZ≤-2) | | | Severe Underweight (WAZ<-3) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | n | % | 95% CI | n | % | 95% CI | n | % | 95% CI |
| Western | Urban | 721 | 90 | 12.5 | 9.9-15.6 | 78 | 10.8 | 8.6-13.6 | 12 | 1.7 | 1.0-2.7 |
| | U.Slums | 605 | 94 | 15.5 | 12.7-18.9 | 79 | 13.1 | 10.4-16.2 | 15 | 2.5 | 1.2-5.0 |
| | Rural | 613 | 66 | 10.8 | 8.3-13.8 | 45 | 7.3 | 5.1-10.4 | 21 | 3.4 | 2.2-5.3 |
| Eastern | Kono | 732 | 99 | 13.5 | 11.0-16.6 | 75 | 10.2 | 8.3-12.6 | 24 | 3.3 | 2.2-4.9 |
| | Kenema | 630 | 99 | 15.7 | 12.3-19.8 | 74 | 11.7 | 9.0-15.2 | 25 | 4.0 | 2.4-6.5 |
| | Kailahun | 532 | 67 | 12.6 | 9.7-16.1 | 49 | 9.2 | 6.8-12.3 | 18 | 3.4 | 2.0-5.7 |
| Southern | Pujehun | 648 | 109 | 16.8 | 13.3-21.0 | 84 | 13.0 | 9.7-17.2 | 25 | 3.9 | 2.3-6.3 |
| | Bo | 529 | 76 | 14.4 | 10.5-19.4 | 53 | 10.0 | 7.2-13.8 | 23 | 4.3 | 2.5-7.3 |
| | Moyamba | 562 | 65 | 11.6 | 9.4-14.1 | 51 | 9.1 | 7.2-11.4 | 14 | 2.5 | 1.6-4.0 |
| | Bonthe | 558 | 62 | 11.1 | 7.8-15.6 | 50 | 9.0 | 5.9-13.3 | 12 | 2.2 | 1.2-3.9 |
| Northern | Kambia | 515 | 68 | 13.2 | 9.7-17.8 | 59 | 11.5 | 8.4-15.4 | 9 | 1.7 | 0.8-3.6 |
| | Port Loko | 517 | 63 | 12.2 | 9.3-15.8 | 49 | 9.5 | 7.2-12.4 | 14 | 2.7 | 1.6-4.6 |
| | Koinadugu | 631 | 84 | 13.3 | 10.5-16.7 | 63 | 10.0 | 7.5-13.2 | 21 | 3.3 | 2.1-5.2 |
| | Tonkololi | 652 | 98 | 15.0 | 11.9-18.7 | 71 | 10.9 | 8.5-13.9 | 27 | 4.1 | 2.7-6.2 |
| | Bombali | 539 | 81 | 15.0 | 11.5-19.3 | 66 | 12.2 | 9.6-15.5 | 15 | 2.8 | 1.6-4.9 |
| National | | 8,984 | 1,221 | 13.6 | 12.8-14.5 | 964 | 10.5 | 9.8-11.3 | 275 | 3.1 | 2.7-3.5 |

### 6.2.3.1 Age Disaggregated Levels of Underweight based on Weight-for-Age Z scores (WAZ)

Analysis of age disaggregated underweight levels shows that prevalence of underweight of 16.7% (95% CI: 15.3-18.1) among the younger children in the breastfeeding age (6-23 months) was significantly higher than the prevalence of 11.7% (95% CI: 10.7-12.7) among the older children aged 24-59 months (RR=1.42; 95% CI: 1.27-1.59). The SAM prevalence of 4.3% (95% CI: 3.6-5.1) among the younger children was also higher than 2.3% (95% CI: 1.9-2.7) among the older children (RR=1.88; 95% CI: 1.46-2.41), indicating the higher vulnerability of this age group to undernutrition (Table 18). In both younger and older age groups, global underweight (19.4% vs 13.9%) and severe underweight (5.7% vs 3.0%) rates were significantly higher among boys than among girls with respective RR of 1.39 (1.20-1.62) and 1.88 (1.35-2.62).

**Table 18:** Age Disaggregated Underweight among 6-23 months and 24-59 months

| Age group | Sex | N | Underweight (WAZ<-2) | | | | Severe Underweight (WAZ<-3) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **n** | **%** | **95% CI** | **Risk Ratio (RR)** | **n** | **%** | **95% CI** | **Risk Ratio (RR)** |
| 6-23 months | M | 1692 | 329 | 19.4 | 17.4-21.5 | | 96 | 5.7 | 4.5-6.9 | |
| | F | 1721 | 240 | 13.9 | 12.3-15.6 | | 52 | 3.0 | 2.2-3.8 | |
| | All | 3413 | 569 | 16.7 | 15.3-18.1 | 1.39 (1.20-1.62) | 148 | 4.3 | 3.6-5.1 | 1.88 (1.35-2.62) |
| 24-59 months | M | 2761 | 362 | 13.1 | 11.6-14.6 | | 78 | 2.8 | 2.2-3.5 | |
| | F | 2816 | 292 | 10.4 | 9.2-11.6 | | 51 | 1.8 | 1.3-2.3 | |
| | All | 5577 | 654 | 11.7 | 10.7-12.7 | 1.26 (1.08-1.48) | 129 | 2.3 | 1.9-2.7 | 1.56 (1.09-2.23) |
| Total | | 8990 | | | | 1.42 (1.27-1.59) | | | | 1.88 (1.46-2.41) |

### 6.2.4   Prevalence of Stunting based on Height-for-Age Z scores (HAZ)

The national prevalence of stunting (HAZ<-2) was **31.3%** (95% CI: 30.0-32.6) with 21.3% (95% CI: 20.3-22.3) moderately stunted and 10.0% (95% CI: 9.2-10.7) severely stunted (Table 19). A higher percentage of boys (35.2%; 95% CI: 33.5-36.9) than girls (27.4%; 95% CI: 25.8-29.1) were stunted ($p$<0.05). Stunting levels are however distributed equally among the younger (6-29 months) and older (30-59 months) age groups (p>0.05). Table 20 shows the national distribution of stunting by age of the child and Fig. 9 shows the national distributions of HAZ scores.

**Table 19:** Prevalence of stunting based on height-for-age z-scores and by sex

| | **All** (n = 8961) | **Boys** (n = 4434) | **Girls** (n = 4527) |
|---|---|---|---|
| **Prevalence of stunting** (<-2 z-score) | (2803) 31.3 % (30.0 - 32.6 95% C.I.) | (1561) 35.2 % (33.5 - 36.9 95% C.I.) | (1242) 27.4 % (25.8 - 29.1 95% C.I.) |
| **Prevalence of moderate stunting** (<-2 z-score and >=-3 z-score) | (1910) 21.3 % (20.3 - 22.3 95% C.I.) | (1041) 23.5 % (22.1 - 24.9 95% C.I.) | (869) 19.2 % (17.9 - 20.5 95% C.I.) |
| **Prevalence of severe stunting** (<-3 z-score) | (893) 10.0 % (9.2 - 10.7 95% C.I.) | (520) 11.7 % (10.7 - 12.8 95% C.I.) | (373) 8.2 % (7.4 - 9.1 95% C.I.) |

**Table 20:** National prevalence of stunting by age based on height-for-age z-scores

| | | Severe stunting (<-3 z-score) | | Moderate stunting (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | |
|---|---|---|---|---|---|---|---|
| Age (mo) | Total no. | No. | % | No. | % | No. | % |
| 6-17 | 2282 | 171 | 7.5 | 370 | 16.2 | 1741 | 76.3 |
| 18-29 | 2180 | 264 | 12.1 | 550 | 25.2 | 1366 | 62.7 |
| 30-41 | 2171 | 252 | 11.6 | 464 | 21.4 | 1455 | 67.0 |
| 42-53 | 1719 | 158 | 9.2 | 398 | 23.2 | 1163 | 67.7 |
| 54-59 | 609 | 48 | 7.9 | 128 | 21.0 | 433 | 71.1 |
| Total | 8961 | 893 | 10.0 | 1910 | 21.3 | 6158 | 68.7 |

**Figure 9**: Distributions of Height-for Age Z Scores in Children 6-59 Months, SLNNS 2017
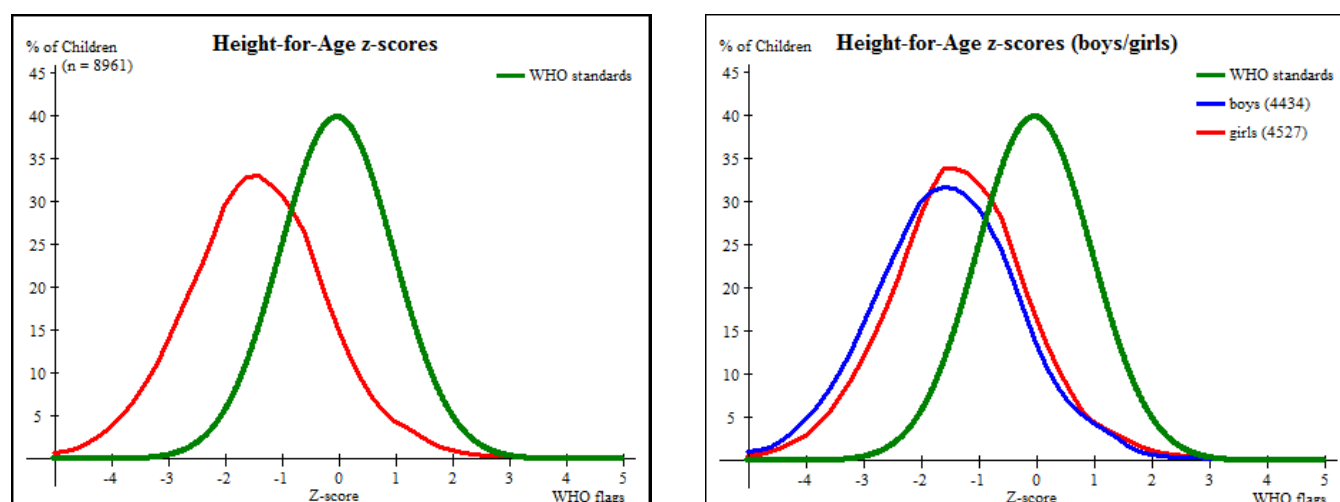


The HAZ curves are shifted to the left, showing a poorer stunting level in Sierra Leone, compared to the WHO (2006) international reference population. When disaggregated by district, the prevalence of stunting ranged from 23.0% (95% CI: 19.9-26.5) in Western Area Urban; 27.3% (95% CI: 22.8-32.3) in Western Area Slums; 27.7% (95% CI: 21.4-35.1) in Port Loko;  and 29.0% (95% CI: 24.6-33.8) in Western Area Rural; to rates above 30% in the rest of the districts with the highest stunting prevalence of 38.7% (95% CI: 34.1-43.6) reported in Pujehun district (Table 21).

**Table 21**: Prevalence of National, Moderate and Severe Stunting in Children (6-59 months) based on HAZ Scores by District

| Province | District | Global Stunting (HAZ<-2) | | | | Moderate Stunting (-3≤HAZ≤-2) | | | Severe Stunting (HAZ<-3) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | n | % | 95% CI | n | % | 95% CI | n | % | 95% CI |
| Western | Urban | 721 | 166 | 23.0 | 19.9-26.5 | 110 | 15.6 | 13.4-18.0 | 56 | 7.8 | 5.8-10.3 |
| | Slums | 605 | 165 | 27.3 | 22.8-32.3 | 114 | 19.2 | 15.5-23.4 | 51 | 8.4 | 5.9-11.8 |
| | Rural | 607 | 176 | 29.0 | 24.6-33.8 | 120 | 20.7 | 16.9-25.1 | 56 | 9.2 | 7.3-11.5 |
| Eastern | Kono | 730 | 224 | 30.7 | 26.6-35.2 | 147 | 20.8 | 18.1-23.8 | 77 | 10.5 | 8.0-13.8 |
| | Kenema | 631 | 221 | 35.0 | 29.1-41.5 | 146 | 23.9 | 19.7-28.7 | 75 | 11.9 | 8.7-16.0 |
| | Kailahun | 530 | 183 | 34.5 | 29.8-39.6 | 131 | 25.5 | 21.6-30.0 | 52 | 9.8 | 7.2-13.2 |
| Southern | Pujehun | 646 | 250 | 38.7 | 34.1-43.6 | 172 | 27.5 | 23.8-31.5 | 78 | 12.1 | 9.2-15.7 |
| | Bo | 527 | 169 | 32.1 | 26.7-38.0 | 116 | 22.5 | 18.0-27.8 | 53 | 10.1 | 7.4-13.5 |
| | Moyamba | 561 | 197 | 35.1 | 30.5-40.0 | 127 | 22.8 | 19.6-26.4 | 70 | 12.5 | 9.5-16.3 |
| | Bonthe | 558 | 175 | 31.4 | 26.5-36.6 | 133 | 24.2 | 19.9-29.0 | 42 | 7.5 | 5.4-10.4 |
| Northern | Kambia | 514 | 169 | 32.9 | 26.9-39.5 | 128 | 25.3 | 20.9-30.2 | 41 | 8.0 | 5.5-11.4 |
| | Port Loko | 519 | 144 | 27.7 | 21.4-35.1 | 97 | 19.4 | 14.9-24.9 | 47 | 9.1 | 6.0-13.4 |
| | Koinadugu | 627 | 196 | 31.3 | 26.3-36.7 | 124 | 20.5 | 16.7-24.9 | 72 | 11.5 | 8.9-14.6 |
| | Tonkololi | 646 | 195 | 30.2 | 25.9-34.9 | 132 | 20.9 | 17.2-25.1 | 63 | 9.8 | 7.6-12.4 |
| | Bombali | 539 | 173 | 32.1 | 27.7-36.8 | 113 | 21.1 | 17.4-25.4 | 60 | 11.1 | 7.9-15.5 |
| **National** | | **8,961** | **2,803** | **31.3** | **30.0-32.6** | **1,910** | **21.3** | **20.3-22.3** | **893** | **10.0** | **9.2-10.7** |

*6.2.4.1  Age Disaggregated Levels of Stunting based on Height-for-Age Z scores (HAZ)*

The prevalence of stunting of 28.2% (95% CI: 26.5-29.9) with severe stunting of 9.3% (95% CI: 8.2-10.3) among the younger children in the breastfeeding age (6-23 months) and was significantly lower among the older children aged 24-59 months (Table 22) in which the prevalence of stunting and severe stunting was 33.4% (95% CI: 31.8-35.1) and 10.8% (95% CI: 9.8-11.7) respectively. The younger children aged 6-23 months were thus less likely to be stunted (RR=0.84; 95% CI: 0.79-0.91) and severely stunted (RR=0.86; 95% CI: 0.75-0.98) than the older children (24-59 months). It is important to note that if stunting is not prevented in the first two years of life, then the effects are irreversible in later years and the prevalence is cumulative, thus likely to be higher. However, global stunting (33.8% vs 22.6%) and severe stunting (12.1% vs 6.5%) rates were significantly more prevalent among boys than among girls with respective RR of 1.50 (1.34-1.67) and 1.85 (1.50-2.30) in younger age group and similarly among the older age group.

**Table 22:** **Age Disaggregated Stunting Rates among 6-23 months and 24-59 months**

| Age group | Sex | N | Stunting (HAZ<-2) | | | | Severe Stunting (HAZ<-3) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | n | % | 95% CI | Risk Ratio (RR) | n | % | 95% CI | Risk Ratio (RR) |
| 6-23 months | M | 1693 | 573 | 33.8 | 31.5-36.2 | | 204 | 12.1 | 10.4-13.7 | |
| | F | 1723 | 390 | 22.6 | 20.5-24.7 | | 112 | 6.5 | 5.3-7.7 | |
| | All | 3416 | 963 | 28.2 | 26.5-29.9 | 1.50 (1.34-1.67) | 316 | 9.3 | 8.2-10.3 | 1.85 (1.50-2.30) |
| 24-59 months | M | 2762 | 1005 | 36.4 | 34.2-38.6 | | 332 | 12.0 | 10.7-13.3 | |
| | F | 2818 | 861 | 30.6 | 28.5-32.6 | | 269 | 9.5 | 8.4-10.7 | |
| | *All* | *5580* | *1866* | *33.4* | *31.8-35.1* | *1.19 (1.10-1.29)* | *601* | *10.8* | *9.8-11.7* | *1.26 (1.09-1.45)* |
| Total | | 8996 | | | | 0.84 (0.79-0.91) | | | | 0.86 (0.75-0.98) |

### 6.2.5  Prevalence of Overweight of children (6-59) based on Weight-for-Height Z scores (WHZ)

The national prevalence of overweight (WHZ>2) in children 6-59 months was 2.3% (95% CI: 2.0-2.6) with severe overweight of 0.3% (95% CI: 0.2-0.5). The prevalence of overweight was not statistically different among the boys (2.5%; 95% CI: 2.1-3.1) and girls (2.0%; 95% CI: 1.6-2.5%) assessed nationally (Table 23). Table 24 shows national prevalence of overweight among the U5 children by age. The distribution of overweight was higher among the older (30-59 months) than among the younger (6-29 months) age group, but this was not statistically significant (p>0.05).

**Table 23**: National prevalence of overweight based on weight for height cut offs and by sex (no oedema)

|  | All (n = 8974) | Boys (n = 4441) | Girls (n = 4533) |
|---|---|---|---|
| **Prevalence of overweight (WHZ > 2)** | (205) 2.3 %<br>(2.0 - 2.6 95% C.I.) | (113) 2.5 %<br>(2.1 - 3.1 95% C.I.) | (92) 2.0 %<br>(1.6 - 2.5 95% C.I.) |
| **Prevalence of severe overweight (WHZ > 3)** | (31) 0.3 %<br>(0.2 - 0.5 95% C.I.) | (17) 0.4 %<br>(0.2 - 0.6 95% C.I.) | (14) 0.3 %<br>(0.2 - 0.6 95% C.I.) |

**Table 24**: National prevalence of overweight by age based on weight-for-heightz-scores

| | | Overweight (WHZ > 2) | | Severe Overweight (WHZ > 3) | |
|---|---|---|---|---|---|
| **Age (months)** | **Total no.** | **No.** | **%** | **No.** | **%** |
| 6-17 | 2283 | 37 | 1.6 | 4 | 0.2 |
| 18-29 | 2184 | 64 | 2.9 | 9 | 0.4 |
| 30-41 | 2172 | 67 | 3.1 | 12 | 0.6 |
| 42-53 | 1723 | 34 | 2.0 | 6 | 0.3 |
| 54-59 | 612 | 3 | 0.5 | 0 | 0.0 |
| **Total** | 8974 | 205 | 2.3 | 31 | 0.3 |

Table 25 shows the distribution of the sample statistics for the survey. The mean Z scores for wasting (WHZ), underweight (WAZ) and stunting (HAZ) were -0.10±1.11; -0.86±1.08 and -0.41±1.29 respectively, all indicating poorer nutrition situation compared to WHO reference population. The standard deviations are within the acceptable range of 0.8-1.2 for WHZ (SD=1.11) and WAZ (SD=1.08); but as expected slightly higher (1.29) for HAZ.

**Table 25**: Mean z-scores, Design Effects and excluded subjects

| Indicator | n | Mean z-scores ± SD | Design Effect (z-score < -2) | z-scores not available* | z-scores out of range |
|---|---|---|---|---|---|
| Weight-for-Height | 8968 | -0.10±1.11 | 1.15 | 74 | 14 |
| Weight-for-Age | 8984 | -0.86±1.08 | 1.41 | 69 | 3 |
| Height-for-Age | 8961 | -1.41±1.29 | 1.83 | 63 | 32 |

\* contains for WHZ and WAZ the children with edema.

### 6.3 Maternal Health and Nutrition

#### 6.3.1 Demographic distribution of Women of Reproductive Age (15-49 Years)

About one third (29.2%) of the 9527 women assessed nationally aged 15-49 years were pregnant or lactating (Table 26). The proportion of those pregnant/ lactating ranged from 12.7% in Western Area Urban to 48% in Kailahun. The overall mean age was 27 (±7.2) years with mean age of 26.1 (±6.0) years among the pregnant and lactating women and 27.4 (±7.6) years among the non-pregnant/ lactating group. The mean age of the assessed women ranged narrowly from 26.1 (±7.5) in Kambia to 28.0 (±7.4) in Port Loko.

**Table 26: Demographic distribution of assessed women (15-49 years) by district**

| District | Total | Non pregnant/lactating | | Pregnant or lactating | | Mean Age (Years) | | |
|---|---|---|---|---|---|---|---|---|
| | N | n | % | n | % | N | Mean | SD |
| Bo | 563 | 348 | 61.8% | 215 | 38.2% | 562 | 27.5 | 7.1 |
| Bombali | 594 | 476 | 80.1% | 118 | 19.9% | 594 | 27.5 | 6.8 |
| Bonthe | 546 | 426 | 78.0% | 120 | 22.0% | 546 | 27.7 | 7.3 |
| Kailahun | 598 | 311 | 52.0% | 287 | 48.0% | 598 | 27.4 | 7.2 |
| Kambia | 618 | 361 | 58.4% | 257 | 41.6% | 617 | 26.1 | 7.5 |
| Kenema | 614 | 405 | 66.0% | 209 | 34.0% | 614 | 26.7 | 6.7 |
| Koinadugu | 777 | 555 | 71.4% | 222 | 28.6% | 777 | 26.6 | 7.6 |
| Kono | 804 | 626 | 77.9% | 178 | 22.1% | 804 | 26.6 | 7.3 |
| Moyamba | 585 | 490 | 83.8% | 95 | 16.2% | 585 | 27.1 | 7.1 |
| Port Loko | 470 | 253 | 53.8% | 217 | 46.2% | 470 | 28.0 | 7.4 |
| Pujehun | 574 | 372 | 64.8% | 202 | 35.2% | 574 | 27.3 | 6.6 |
| Tonkolili | 659 | 474 | 71.9% | 185 | 28.1% | 659 | 27.9 | 7.6 |
| WA-Rural | 705 | 530 | 75.2% | 175 | 24.8% | 705 | 26.3 | 7.5 |
| WA-Slums | 640 | 438 | 68.4% | 202 | 31.6% | 640 | 26.9 | 6.4 |
| WA-Urban | 780 | 681 | 87.3% | 99 | 12.7% | 780 | 27.0 | 6.9 |
| Total | 9,527 | 6,746 | 70.8% | 2,781 | 29.2% | 9525 | 27.0 | 7.2 |

#### 6.3.2 Nutrition Status of Women (15-49 years)

The national prevalence of acute malnutrition using MUAC (<23 cm) was **5.7%** (95% CI: 4.8-6.6) among the pregnant and/or lactating women (PLW) but much lower (MUAC<18.5 cm) at 0.1% (95% CI: 0.0-0.2) among the non-pregnant/lactating women (Table 27). The prevalence of acute malnutrition (MUAC<23 cm) varied from 0% in Western Area rural to 8.4% in Kailahun.

**Table 27:** Acute Malnutrition among Women (15-49 years) based on MUAC by district

| District | Total | Non-Pregnant/Lactating | | | Pregnant/Lactating | | |
|---|---|---|---|---|---|---|---|
| | N | N | n | % | N | n | % |
| Bo | 554 | 340 | 2 | .6 | 214 | 16 | 7.5 |
| Bombali | 594 | 476 | 0 | 0.0 | 118 | 4 | 3.4 |
| Bonthe | 546 | 426 | 0 | 0.0 | 120 | 5 | 4.2 |
| Kailahun | 598 | 311 | 1 | .3 | 287 | 24 | 8.4 |
| Kambia | 615 | 360 | 0 | 0.0 | 255 | 6 | 2.4 |
| Kenema | 614 | 405 | 0 | 0.0 | 209 | 17 | 8.1 |
| Koinadugu | 773 | 552 | 2 | .4 | 221 | 11 | 5.0 |
| Kono | 803 | 625 | 2 | .3 | 178 | 9 | 5.1 |
| Moyamba | 585 | 490 | 0 | 0.0 | 95 | 5 | 5.3 |
| Port Loko | 470 | 253 | 0 | 0.0 | 217 | 11 | 5.1 |
| Pujehun | 574 | 372 | 1 | .3 | 202 | 15 | 7.4 |
| Tonkolili | 649 | 466 | 0 | 0.0 | 183 | 9 | 4.9 |
| WA-Rural | 688 | 518 | 0 | 0.0 | 170 | 11 | 6.5 |
| WA-Slums | 639 | 437 | 0 | 0.0 | 202 | 14 | 6.9 |
| WA-Urban | 778 | 679 | 2 | .3 | 99 | 0 | 0.0 |
| National | 9480 | 6710 | 10 | .1% | 2770 | 157 | 5.7% |

The national prevalence of underweight (BMI<among the assessed 6712 non-pregnant/lactating women was **5.1%** (95% CI: 4.5-5.8). The levels of underweight ranged from 1.8% in Western Area Slums to 8.1% in Kenema (Table 28). On the other hand, the prevalence of overweight and obese was 18.4% (95% CI: 17.3-19.5) and 7.5% (95% CI: 6.7-8.3) respectively indicating the emerging double burden of malnutrition in the country. Prevalence of obesity is especially high in the Western Area among the Slums (13.0%) and Urban (14.7%) populations.

**Table 28**: Nutrition status of Women (15-49 years) based on Body Mass Index (BMI) by district

| District | Total | Underweight (BMI<18.5) | | Healthy/normal (BMI 18.5-24.9) | | Overweight (BMI 25.0-29.9) | | Obese (BMI>=30) | |
|---|---|---|---|---|---|---|---|---|---|
| | N | n | % | n | % | n | % | n | % |
| Bo | 340 | 11 | 3.2 | 228 | 67.1 | 73 | 21.5 | 28 | 8.2 |
| Bombali | 476 | 21 | 4.4 | 351 | 73.7 | 81 | 17.0 | 23 | 4.8 |
| Bonthe | 426 | 14 | 3.3 | 294 | 69.0 | 87 | 20.4 | 31 | 7.3 |
| Kailahun | 311 | 14 | 4.5 | 232 | 74.6 | 55 | 17.7 | 10 | 3.2 |
| Kambia | 360 | 23 | 6.4 | 272 | 75.6 | 48 | 13.3 | 17 | 4.7 |
| Kenema | 405 | 33 | 8.1 | 298 | 73.6 | 57 | 14.1 | 17 | 4.2 |
| Koinadugu | 552 | 44 | 8.0 | 397 | 71.9 | 92 | 16.7 | 19 | 3.4 |
| Kono | 626 | 28 | 4.5 | 459 | 73.3 | 95 | 15.2 | 44 | 7.0 |
| Moyamba | 490 | 26 | 5.3 | 326 | 66.5 | 94 | 19.2 | 44 | 9.0 |
| Port Loko | 253 | 20 | 7.9 | 170 | 67.2 | 42 | 16.6 | 21 | 8.3 |
| Pujehun | 372 | 30 | 8.1 | 261 | 70.2 | 64 | 17.2 | 17 | 4.6 |
| Tonkolili | 466 | 17 | 3.6 | 330 | 70.8 | 91 | 19.5 | 28 | 6.0 |
| WA-Rural | 517 | 26 | 5.0 | 341 | 66.0 | 104 | 20.1 | 46 | 8.9 |
| WA-Slums | 438 | 8 | 1.8 | 288 | 65.8 | 85 | 19.4 | 57 | 13.0 |
| WA-Urban | 680 | 30 | 4.4 | 382 | 56.2 | 168 | 24.7 | 100 | 14.7 |
| National | 6712 | 345 | 5.1% | 4629 | 69.0 | 1236 | 18.4 | 502 | 7.5 |

### 6.3.3   Dietary Diversity among Women (15-49 years)

Nationally, the dietary consumption pattern was characterized by frequent consumption of foods from grains (90.8%), dark green leafy vegetables (76.7%), and nuts & seeds (75.5%) food groups in a 24-hour recall. Organ meat (10.9%), vitamin A rich fruits (18.0%), meat & poultry (23.3%), eggs (24.3%), and vitamin A- rich vegetables, roots & tubers (25.1%) were least frequently consumed. White roots/tubers and plantain (58.5%), pulses (54.5%) other vegetables (33.8%) and other fruits (32.4%) were moderately consumed by women.

When reconstituted into 10 food groups, similar pattern is observed with grains, white roots & tubers being the most frequently consumed (96.3%) and eggs (24.3%) least frequently consumed by women (Table 29).

**Table 29:** **Women Consumption of Different Food Groups by district**

| District | Grains, white roots & tubers [A+B] | | Pulses [C] | | Nuts and seeds [D] | | Dairy [E] | | Meat, poultry & fish [F+G+H] | | Eggs [I] | | Dark green leafy vegetables [J] | | Other vitamin A rich fruits and vegetables [K+L] | | Other vegetables [M] | | Other fruits [N] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Bo | 552 | 99.5 | 417 | 75.1 | 471 | 84.9 | 193 | 34.8 | 547 | 98.6 | 274 | 48.7 | 414 | 73.5 | 213 | 37.8 | 311 | 55.2 | 202 | 36.4 |
| Bombali | 576 | 97.0 | 362 | 60.9 | 523 | 88.0 | 122 | 20.5 | 557 | 93.8 | 177 | 29.8 | 499 | 84.0 | 214 | 36.0 | 150 | 25.3 | 107 | 18.0 |
| Bonthe | 459 | 84.1 | 154 | 28.2 | 348 | 63.7 | 36 | 6.6 | 542 | 99.3 | 80 | 14.7 | 220 | 40.3 | 79 | 14.5 | 196 | 35.9 | 197 | 36.1 |
| Kailahun | 594 | 99.3 | 356 | 59.5 | 495 | 82.8 | 96 | 16.1 | 587 | 98.2 | 128 | 21.4 | 533 | 89.1 | 273 | 45.7 | 311 | 52.0 | 220 | 36.8 |
| Kambia | 600 | 97.1 | 282 | 45.6 | 426 | 68.9 | 43 | 7.0 | 559 | 90.5 | 46 | 7.4 | 531 | 85.9 | 150 | 24.3 | 266 | 43.0 | 187 | 30.3 |
| Kenema | 557 | 90.7 | 289 | 47.1 | 374 | 60.9 | 127 | 20.7 | 566 | 92.2 | 96 | 15.6 | 358 | 58.3 | 205 | 33.4 | 146 | 23.8 | 202 | 32.9 |
| Koinadugu | 749 | 96.3 | 469 | 60.3 | 644 | 82.8 | 286 | 36.8 | 728 | 93.6 | 139 | 17.9 | 609 | 78.3 | 283 | 36.4 | 218 | 28.0 | 166 | 21.3 |
| Kono | 794 | 98.8 | 506 | 62.9 | 630 | 78.4 | 264 | 32.8 | 768 | 95.5 | 208 | 25.9 | 766 | 95.3 | 302 | 37.6 | 258 | 32.1 | 259 | 32.2 |
| Moyamba | 582 | 99.5 | 392 | 67.0 | 461 | 78.8 | 132 | 22.6 | 571 | 97.6 | 145 | 24.8 | 523 | 89.4 | 215 | 36.8 | 276 | 47.2 | 330 | 56.4 |
| Port Loko | 447 | 95.1 | 228 | 48.5 | 319 | 67.9 | 47 | 10.0 | 445 | 94.7 | 30 | 6.4 | 344 | 73.2 | 180 | 38.3 | 101 | 21.5 | 102 | 21.7 |
| Pujehun | 572 | 99.7 | 221 | 38.5 | 272 | 47.4 | 96 | 16.7 | 555 | 96.7 | 24 | 4.2 | 496 | 86.4 | 103 | 17.9 | 134 | 23.3 | 88 | 15.3 |
| Tonkolili | 640 | 98.0 | 353 | 54.1 | 586 | 89.7 | 123 | 18.8 | 632 | 96.8 | 123 | 18.7 | 456 | 69.2 | 95 | 14.4 | 193 | 29.3 | 199 | 30.5 |
| WA-Rural | 669 | 97.2 | 390 | 56.7 | 556 | 80.8 | 222 | 32.3 | 684 | 99.4 | 281 | 39.9 | 298 | 42.3 | 143 | 20.3 | 118 | 16.8 | 245 | 35.6 |
| WA-Slums | 620 | 96.9 | 306 | 47.8 | 485 | 75.8 | 223 | 34.8 | 635 | 99.2 | 183 | 28.6 | 540 | 84.4 | 133 | 20.8 | 170 | 26.6 | 129 | 20.2 |
| WA-Urban | 729 | 93.6 | 454 | 58.3 | 582 | 74.7 | 347 | 44.5 | 764 | 98.1 | 377 | 48.3 | 692 | 88.7 | 215 | 27.6 | 357 | 45.8 | 446 | 57.3 |
| **Total** | 9140 | 96.3 | 5179 | 54.5 | 7172 | 75.5 | 2357 | 24.8 | 9140 | 96.3 | 2311 | 24.3 | 7279 | 76.4 | 2803 | 29.4 | 3205 | 33.6 | 3079 | 32.4 |

Based on dietary diversity scores from 10 food groups, the mean dietary diversity score (MDDS-W) was 5.4 ±1.9 food groups and 68.4% (95% CI: 65.4-71.4) of the assessed women met the minimum dietary diversity for women (MDDW). The proportion varies from district to district ranging from 43% in Pujehun to 92.4% in Bo (Table 30).

**Table 30: Proportion of Women Consuming Minimum Dietary Diversity by district**

| District | Women Consuming MDD from 10 food groups | | | | | Mean Minimum Dietary Diversity Score for Women (MDDS-W) | | |
|---|---|---|---|---|---|---|---|---|
| | Total | No ( <5 Food Groups) | | Yes (≥5 Food groups) | | | | |
| | N | n | % | n | % | N | Mean | SD |
| Bo | 555 | 42 | 7.6% | 513 | 92.4% | 555 | 6.5 | 1.6 |
| Bombali | 594 | 220 | 37.0% | 374 | 63.0% | 594 | 5.5 | 2.1 |
| Bonthe | 546 | 303 | 55.5% | 243 | 44.5% | 546 | 4.2 | 1.5 |
| Kailahun | 598 | 108 | 18.1% | 490 | 81.9% | 598 | 6.0 | 1.7 |
| Kambia | 618 | 244 | 39.5% | 374 | 60.5% | 618 | 5.0 | 1.8 |
| Kenema | 614 | 263 | 42.8% | 351 | 57.2% | 614 | 4.8 | 1.8 |
| Koinadugu | 778 | 163 | 21.0% | 615 | 79.0% | 778 | 5.5 | 1.5 |
| Kono | 804 | 231 | 28.7% | 573 | 71.3% | 804 | 5.9 | 2.3 |
| Moyamba | 585 | 144 | 24.6% | 441 | 75.4% | 585 | 6.2 | 2.3 |
| Port Loko | 470 | 224 | 47.7% | 246 | 52.3% | 470 | 4.8 | 1.5 |
| Pujehun | 574 | 327 | 57.0% | 247 | 43.0% | 574 | 4.5 | 1.7 |
| Tonkolili | 653 | 211 | 32.3% | 442 | 67.7% | 653 | 5.2 | 1.4 |
| WA-Rural | 688 | 183 | 26.6% | 505 | 73.4% | 688 | 5.2 | 1.7 |
| WA-Slums | 640 | 197 | 30.8% | 443 | 69.2% | 640 | 5.4 | 1.6 |
| WA-Urban | 779 | 142 | 18.2% | 637 | 81.8% | 779 | 6.4 | 2.1 |
| National | 9496 | 3002 | 31.6% | 6494 | 68.4% | 9496 | 5.4 | 1.9 |

### 6.4    Mortality Results

The crude death rate (CDR) was **0.19** (95% CI: 0.15-0.24) and the under five mortality rate (U5DR) was **0.16** (95% CI; 0.10-0.27) [Table 31] .Both CDR and U5DR rates nationally and by district are below the SPHERE *alert* thresholds of 1/10,000/day and 2/10,000/day respectively. The design effects for CDR and U5DR were 1.12 and 1.00 respectively indicating little inter-cluster variations (clustering of deaths) in the population. Illnesses were the main cause of mortality among U5s (92.9%) and crude mortality (81.9%), this was confirmed by District Medical Officers (DMOs), injuries only contributed to least mortality.

**Table 31:** **Mortality Rates SLNNS 2017**

| District | Crude Death Rate (deaths/10,000/day) | | | | Under five Death Rate (U5 deaths/10,000/day) | | |
|---|---|---|---|---|---|---|---|
| | N | CDR | 95% CI | DEFF | U5DR | 95% CI | DEFF |
| Bo | 534 | 0.25 | 0.09-0.68 | 1.43 | 0.18 | 0.02-1.37 | 1.00 |
| Bombali | 618 | 0.33 | 0.14-0.75 | 1.14 | 0.28 | 0.04-2.05 | 1.00 |
| Bonthe | 582 | 0.09 | 0.02-0.35 | 1.00 | 0.00 | 0.00-0.00 | 1.00 |
| Kailahun | 632 | 0.12 | 0.03-0.52 | 1.52 | 0.20 | 0.03-1.58 | 1.01 |
| Kambia | 526 | 0.14 | 0.04-0.42 | 1.00 | 0.28 | 0.03-2.20 | 1.00 |
| Kenema | 652 | 0.18 | 0.07-0.46 | 1.00 | 0.00 | 0.00-0.00 | 1.00 |
| Koinadugu | 695 | 0.07 | 0.02-0.30 | 1.00 | 0.18 | 0.02-1.37 | 1.00 |
| Kono | 691 | 0.24 | 0.11-0.53 | 1.22 | 0.31 | 0.07-1.33 | 1.00 |
| Moyamba | 576 | 0.29 | 0.13-0.66 | 1.23 | 0.17 | 0.02-1.30 | 1.00 |
| Port Loko | 455 | 0.36 | 0.16-0.80 | 1.03 | 0.77 | 0.25-2.32 | 1.00 |
| Pujehun | 566 | 0.12 | 0.00-0.38 | 1.00 | 0.00 | 0.00-0.00 | 1.00 |
| Tonkolili | 603 | 0.17 | 0.06-0.44 | 1.00 | 0.16 | 0.02-1.23 | 1.00 |
| WA-Rural | 642 | 0.18 | 0.06-0.50 | 1.24 | 0.13 | 0.02-1.03 | 1.00 |
| WA-Slums | 552 | 0.08 | 0.02-0.35 | 1.00 | 0.00 | 0.00-0.00 | 1.00 |
| WA-Urban | 635 | 0.25 | 0.12-0.50 | 1.00 | 0.15 | 0.02-1.12 | 1.00 |
| National | 8950 | 0.19 | 0.15-0.24 | 1.12 | 0.16 | 0.10-0.27 | 1.00 |

## 6.5: Children's Morbidity

The national prevalence of retrospective child morbidity was 22.1% (95% CI: 20.3-24.0) from 14-day recall (Table 32). The rates varied from 12.4% in Moyamba to 41.2% in Port Loko reporting child getting ill in 14 days prior to the survey. Majority of these had fever (75.0%; 95% CI: 71.7-78.4), but many also had cough (35.7%; 95% CI: 31.7-39.8) or diarrhea (6.3%; 95% CI: 3.7-9.0). Other illnesses (18.9%; 95% CI: 15.7-22.1) reported included skin infections (rashes, boils, burns and blisters), eye infections, malaria and anaemia.

**Table 32:** **Prevalence of reported common illness among children (6-59 months)**

| District | | Fell ill in last 14 days | | Fever | | Cough | | Diarrhoea | | Other Illnesses | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | n | % | n | % | n | % | n | % | n | % |
| Bo | 531 | 84 | 15.8 | 66 | 78.6 | 25 | 29.8 | 1 | 1.2 | 10 | 11.9 |
| Bombali | 543 | 173 | 31.9 | 150 | 86.7 | 36 | 20.8 | 1 | .6 | 12 | 6.9 |
| Bonthe | 567 | 92 | 16.2 | 77 | 83.7 | 21 | 22.8 | 0 | 0.0 | 7 | 7.6 |
| Kailahun | 536 | 191 | 35.6 | 170 | 89.0 | 81 | 42.4 | 19 | 9.9 | 50 | 26.2 |
| Kambia | 535 | 79 | 14.8 | 41 | 51.9 | 27 | 34.2 | 6 | 7.6 | 20 | 25.3 |
| Kenema | 632 | 103 | 16.3 | 72 | 69.9 | 36 | 35.0 | 4 | 3.9 | 7 | 6.8 |
| Koinadugu | 654 | 191 | 29.2 | 56 | 29.3 | 40 | 20.9 | 9 | 4.7 | 137 | 71.7 |
| Kono | 736 | 167 | 22.7 | 135 | 80.8 | 28 | 16.8 | 3 | 1.8 | 8 | 4.8 |
| Moyamba | 563 | 70 | 12.4 | 48 | 68.6 | 12 | 17.1 | 1 | 1.4 | 13 | 18.6 |
| Port Loko | 522 | 215 | 41.2 | 191 | 88.8 | 114 | 53.0 | 68 | 31.6 | 29 | 13.5 |
| Pujehun | 648 | 159 | 24.5 | 122 | 76.7 | 93 | 58.5 | 0 | 0.0 | 24 | 15.1 |
| Tonkolili | 658 | 126 | 19.1 | 98 | 77.8 | 49 | 38.9 | 1 | .8 | 21 | 16.7 |
| WA-Rural | 615 | 83 | 13.5 | 48 | 57.8 | 40 | 48.2 | 0 | 0.0 | 8 | 9.6 |
| WA-Slums | 607 | 117 | 19.3 | 112 | 95.7 | 84 | 71.8 | 4 | 3.4 | 26 | 22.2 |
| WA-Urban | 722 | 157 | 21.7 | 120 | 76.4 | 31 | 19.7 | 10 | 6.4 | 7 | 4.5 |
| Total | 9069 | 2007 | 22.1 | 1506 | 75.0 | 717 | 35.7 | 127 | 6.3 | 379 | 18.9 |

Most of the child illnesses were treated at the public health facilities (84.3%) especially in community health facilities i.e. CHP, CHC or MCHP (50.5%), or hospital (28.6%). Another 7.3% sought treatment in a private health facilities/services including private clinics (1.5%), traditional practitioners (3.2%) or home/self treatments (2.5%), but a significant proportion 8.4% did not seek treatment from any treatment at all. Table 33 shows the type of health facilities/services sought for the child illnesses by district and nationally.

**Table 33: Health facility where treatment services are sought (6-59 months) by district**

| District | Total | None | | Public Health Facility/services | | | | | | | | | | | Private health facility/services | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | | Hospital | | Pharmacy / Chemist | | Mobile/ outreach clinic | | Community Health Facility (CHP/CHC, MCHP) | | Total | | Private clinic | | Traditional practitioner | | Others (e.g. home treatment) | |
| | N | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Bo | 84 | 6 | 7.1 | 67 | 79.8 | 5 | 6.0 | 10 | 11.9 | 2 | 2.4 | 50 | 59.5 | 11 | 13.1 | 8 | 9.5 | 1 | 1.2 | 2 | 2.4 |
| Bombali | 173 | 18 | 10.4 | 152 | 87.9 | 11 | 6.4 | 6 | 3.5 | 0 | 0.0 | 135 | 78.0 | 3 | 1.7 | 1 | .6 | 1 | .6 | 1 | .6 |
| Bonthe | 92 | 6 | 6.5 | 75 | 81.5 | 37 | 40.2 | 2 | 2.2 | 1 | 1.1 | 35 | 38.0 | 11 | 12.0 | 2 | 2.2 | 9 | 9.8 | 0 | 0.0 |
| Kailahun | 191 | 12 | 6.3 | 177 | 92.7 | 4 | 2.1 | 6 | 3.1 | 1 | .5 | 166 | 86.9 | 2 | 1.0 | 0 | 0.0 | 0 | 0.0 | 2 | 1.0 |
| Kambia | 79 | 21 | 26.6 | 57 | 72.2 | 27 | 34.2 | 2 | 2.5 | 0 | 0.0 | 28 | 35.4 | 1 | 1.3 | 1 | 1.3 | 0 | 0.0 | 0 | 0.0 |
| Kenema | 103 | 6 | 5.8 | 93 | 90.3 | 58 | 56.3 | 5 | 4.9 | 0 | 0.0 | 30 | 29.1 | 4 | 3.9 | 0 | 0.0 | 4 | 3.9 | 0 | 0.0 |
| Koinadugu | 191 | 4 | 2.1 | 182 | 95.3 | 177 | 92.7 | 1 | .5 | 3 | 1.6 | 1 | .5% | 5 | 2.6 | 0 | 0.0 | 5 | 2.6 | 0 | 0.0 |
| Kono | 167 | 15 | 9.0 | 148 | 88.6 | 8 | 4.8 | 1 | .6 | 3 | 1.8 | 136 | 81.4 | 4 | 2.4 | 0 | 0.0 | 3 | 1.8 | 1 | .6 |
| Moyamba | 70 | 6 | 8.6 | 62 | 88.6 | 23 | 32.9 | 0 | 0.0 | 0 | 0.0 | 39 | 55.7 | 2 | 2.9 | 0 | 0.0 | 2 | 2.9 | 0 | 0.0 |
| Port Loko | 215 | 4 | 1.9 | 154 | 71.6 | 51 | 23.7 | 4 | 1.9 | 1 | .5 | 98 | 45.6 | 57 | 26.5 | 2 | .9 | 11 | 5.1 | 44 | 20.5 |
| Pujehun | 159 | 17 | 10.7 | 142 | 89.3 | 35 | 22.0 | 1 | .6 | 0 | 0.0 | 106 | 66.7 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Tonkolili | 126 | 13 | 10.3 | 93 | 73.8 | 35 | 27.8 | 6 | 4.8 | 0 | 0.0 | 52 | 41.3 | 20 | 15.9 | 1 | .8 | 18 | 14.3 | 1 | .8 |
| WA-Rural | 83 | 14 | 16.9 | 67 | 80.7 | 24 | 28.9 | 14 | 16.9 | 0 | 0.0 | 29 | 34.9 | 2 | 2.4 | 2 | 2.4 | 0 | 0.0 | 0 | 0.0 |
| WA-Slums | 117 | 23 | 19.7 | 94 | 80.3 | 25 | 21.4 | 19 | 16.2 | 0 | 0.0 | 50 | 42.7 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| WA-Urban | 157 | 4 | 2.5 | 129 | 82.2 | 55 | 35.0 | 15 | 9.6 | 0 | 0.0 | 59 | 37.6 | 24 | 15.3 | 14 | 8.9 | 10 | 6.4 | 0 | 0.0 |
| Total | 2007 | 169 | 8.4 | 1692 | 84.3 | 575 | 28.6 | 92 | 4.6 | 11 | .5 | 1014 | 50.5 | 146 | 7.3 | 31 | 1.5 | 64 | 3.2 | 51 | 2.5 |

## 6.6     Health Programmes Coverage

The national coverage by recall for vitamin A supplementation was 80.3% (95% CI: 77.6-82.9), just above the SPHERE recommended 80%; and 71.5% the assessed (9-59 months) children had received measles vaccine, by card (58.6%; 95% CI: 55.1-62.1) or recall (12.9%; 95% CI: 10.5-15.3). Furthermore, 69.1% (95% CI: 65.9-72.3) of the assessed children (12-59 months) had been dewormed in the preceding 6 months (Table 34). However, it is worth noting that the SMART survey was conducted four (4) months after the last round of mass deworming and the results are alikely underestimation due to recall bias. All post event coverage surveys performed within the recommended one month have previously shown deworming coverage well over 85%.

On appositive note, a higher proportion (93.4%; 95% CI: 92.1-94.7) of the assessed (9-59 months) children had slept under treated mosquito nets.

**Table 34**: Immunization Status and Programme Coverage by district

| District | N | Vitamin A Supp | | Measles Vaccination | | | | | | Slept under mosquito net | | Deworming in Children (12-59 months) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Yes, with EPI card | | Yes, by recall | | Child<9 months | | | | | | |
| | | n | % | n | % | n | % | n | % | n | % | N | n | % |
| Bo | 531 | 499 | 94.0 | 329 | 62.0 | 48 | 9.0 | 32 | 6.0 | 500 | 94.2 | 467 | 318 | 68.1 |
| Bombali | 543 | 404 | 74.4 | 341 | 62.8 | 19 | 3.5 | 42 | 7.7 | 499 | 91.9 | 471 | 333 | 70.7 |
| Bonthe | 567 | 486 | 85.7 | 355 | 62.6 | 148 | 26.1 | 32 | 5.6 | 553 | 97.5 | 497 | 359 | 72.2 |
| Kailahun | 536 | 465 | 86.8 | 463 | 86.4 | 36 | 6.7 | 26 | 4.9 | 487 | 90.9 | 473 | 385 | 81.4 |
| Kambia | 535 | 473 | 88.4 | 348 | 65.0 | 31 | 5.8 | 55 | 10.3 | 476 | 89.0 | 441 | 329 | 74.6 |
| Kenema | 632 | 468 | 74.1 | 314 | 49.7 | 138 | 21.8 | 36 | 5.7 | 619 | 97.9 | 559 | 337 | 60.3 |
| Koinadugu | 654 | 275 | 42.0 | 113 | 17.3 | 90 | 13.8 | 52 | 8.0 | 634 | 96.9 | 564 | 143 | 25.4 |
| Kono | 736 | 555 | 75.4 | 441 | 59.9 | 17 | 2.3 | 50 | 6.8 | 719 | 97.7 | 629 | 408 | 64.9 |
| Moyamba | 563 | 424 | 75.3 | 307 | 54.5 | 98 | 17.4 | 40 | 7.1 | 558 | 99.1 | 489 | 344 | 70.3 |
| Port Loko | 522 | 483 | 92.5 | 213 | 40.8 | 92 | 17.6 | 44 | 8.4 | 486 | 93.1 | 452 | 355 | 78.5 |
| Pujehun | 648 | 494 | 76.2 | 505 | 77.9 | 4 | .6 | 44 | 6.8 | 613 | 94.6 | 555 | 393 | 70.8 |
| Tonkolili | 658 | 610 | 92.7 | 396 | 60.2 | 148 | 22.5 | 47 | 7.1 | 638 | 97.0 | 571 | 430 | 75.3 |
| WA-Rural | 615 | 469 | 76.3 | 299 | 48.6 | 194 | 31.5 | 36 | 5.9 | 602 | 97.9 | 544 | 424 | 77.9 |
| WA-Slums | 607 | 488 | 80.4 | 438 | 72.2 | 33 | 5.4 | 33 | 5.4 | 491 | 80.9 | 534 | 385 | 72.1 |
| WA-Urban | 722 | 685 | 94.9 | 451 | 62.5 | 75 | 10.4 | 43 | 6.0 | 596 | 82.5 | 630 | 502 | 79.7 |
| Total | 9069 | 7278 | 80.3 | 5313 | 58.6 | 1171 | 12.9 | 612 | 6.7 | 8471 | 93.4 | 7876 | 5445 | 69.1 |

## 6.7    Infant and Young Child Feeding (IYCF) Practices

### 6.7.1  Breastfeeding Practices

Among the assessed infants and young children (0-23 months), 99.1% (95% CI: 98.7-99.4) were ever-breastfed nationally, with prevalence varying from 97.6% in Pujehun to 100% in Moyamba. Nationally, 56.8%, 39.1% and 2.5% were first initiated to breast milk within the first hour, within the one day and after one day respectively (Table 35). The proportion of all the children breastfeeding at the time of the survey were 88.2% (95% CI: 86.9-89.5), with prevalence ranging from 80.9% in Kono to 98.0% in Koinadugu. Notably, 23.3% (95% CI: 20.9-25.6) of the assessed children (0-23 months) were reportedly bottle-fed; with prevalence varying by district from 11.7% in Bonthe to 38.1% in Western Area Urban.

**Table 35:** Breast-feeding Practices among infant and young children (0-23 months) by district

| District | N | Child ever breastfed | | How long after birth child was put to breast | | | | | | | | Breastfeeding (breastfed yesterday) | | Bottle feeding (bottle-fed yesterday) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Less than 1 hour | | Within the first day (24 hours) | | After the first day (>24 hours) | | Don't know | | | | | |
| | | n | (95% CI) | n | % | n | % | n | % | n | % | n | (95% CI) | n | (95% CI) |
| Bo | 274 | 272 | 99.3 (98.3-100) | 218 | 79.6 | 52 | 19.0 | 1 | .4 | 3 | 1.1 | 251 | 91.6 (86.1-97.1) | 65 | 23.7 (18.6-28.9) |
| Bombali | 244 | 243 | 99.6 (98.8-100) | 111 | 45.5 | 116 | 47.5 | 11 | 4.5 | 6 | 2.5 | 201 | 82.4 (76.2-88.6) | 54 | 22.1 (12.2-32.1) |
| Bonthe | 299 | 298 | 99.7 (99.0-100) | 142 | 47.5 | 155 | 51.8 | 1 | .3 | 1 | .3 | 243 | 81.3 (77.3-85.2) | 35 | 11.7 (6.7-16.7) |
| Kailahun | 271 | 269 | 99.3 (98.3-100) | 183 | 67.5 | 84 | 31.0 | 3 | 1.1 | 1 | .4 | 248 | 91.5 (87.7-95.4) | 77 | 28.5 (22.0-34.8) |
| Kambia | 300 | 299 | 99.7 (99.0-100) | 141 | 47.0 | 156 | 52.0 | 3 | 1.0 | 1 | .3 | 278 | 92.7 (89.2-96.2) | 43 | 14.3 (8.1-19.9) |
| Kenema | 309 | 303 | 98.1 (96.3-99.8) | 238 | 77.0 | 64 | 20.7 | 4 | 1.3 | 3 | 1.0 | 270 | 87.4 (82.6-92.1) | 40 | 12.9 (7.3-18.6) |
| Koinadugu | 347 | 343 | 98.8 (97.8-99.9) | 203 | 58.5 | 95 | 27.4 | 32 | 9.2 | 17 | 4.9 | 340 | 98.0 (96.4-99.6) | 107 | 30.8 (25.4-36.3) |
| Kono | 329 | 328 | 99.7 (99.1-100) | 138 | 41.9 | 175 | 53.2 | 7 | 2.1 | 9 | 2.7 | 266 | 80.9 (73.4-88.3) | 69 | 20.9 (10.7-31.3) |
| Moyamba | 286 | 286 | 100.0 | 161 | 56.3 | 118 | 41.3 | 5 | 1.7 | 2 | .7 | 259 | 90.6 (85.4-95.7) | 77 | 26.9 (16.6-37.2) |
| Port Loko | 250 | 246 | 98.4 (95.9-100) | 165 | 66.0 | 60 | 24.0 | 18 | 7.2 | 7 | 2.8 | 226 | 90.4 (85.6-95.2) | 56 | 22.4 (12.9-32.3) |
| Pujehun | 338 | 330 | 97.6 (95.4-99.9) | 178 | 52.7 | 155 | 45.9 | 4 | 1.2 | 1 | .3 | 305 | 90.2 (87.1-93.4) | 47 | 13.9 (8.6-19.2) |
| Tonkolili | 332 | 326 | 98.2 (95.7-100) | 114 | 34.3 | 195 | 58.7 | 14 | 4.2 | 8 | 2.4 | 307 | 92.5 (88.5-96.4) | 74 | 22.3 (12.9-32.3) |
| WA-Rural | 321 | 319 | 99.4 (98.6-100) | 220 | 68.5 | 94 | 29.3 | 4 | 1.2 | 3 | .9 | 274 | 85.4 (81.3-90.6) | 78 | 24.3 (14.6-34.0) |
| WA-Slums | 335 | 332 | 99.1 (98.1-100) | 185 | 55.2 | 145 | 43.3 | 2 | .6 | 3 | .9 | 288 | 86.0 (81.3-90.6) | 116 | 34.6 (21.0-48.3) |
| WA-Urban | 315 | 313 | 99.4 (98.5-100) | 188 | 59.7 | 115 | 36.5 | 7 | 2.2 | 5 | 1.6 | 255 | 81.0 (75.5-86.4) | 120 | 38.1 (28.0-48.2) |
| Total | 4550 | 4507 | 99.1 (98.7-99.4) | 2585 | 56.8 | 1779 | 39.1 | 116 | 2.5 | 70 | 1.5 | 4011 | 88.2 (86.9-89.5) | 1058 | 23.3 (20.9-25.6) |

**Table 36**: Exclusive and Continued Breast feeding Indicators, SLNNS 2017

| District | Timely initiation of breastfeeding (0-23 months) | | | Exclusive Breastfeeding (0-5 months) | | | Child (0-5 months) fed on Colostrums | | Continued breastfeeding at 1 year (12-15 months) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | n | % (95% CI) | N | n | % (95% CI) | n | % (95% CI) | N | n | % (95% CI) |
| Bo | 274 | 218 | 79.6 (72.5-86.6) | 69 | 47 | 68.1 (54.9-81.4) | 49 | 71.0 (52.9-89.2) | 32 | 32 | 100.0 |
| Bombali | 244 | 111 | 45.5 (30.4-60.6) | 34 | 22 | 64.7 (47.2-82.2) | 26 | 76.5 (58.9-94.0) | 31 | 29 | 93.5 (84.8-100) |
| Bonthe | 299 | 142 | 47.5 (35.8-59.2) | 70 | 32 | 45.7 (33.2-58.3) | 64 | 91.4 (84.2-98.7) | 35 | 32 | 91.4 (82.2-100) |
| Kailahun | 271 | 183 | 67.5 (55.2-79.9) | 76 | 51 | 67.1 (51.8-82.4) | 67 | 88.2 (77.3-99.0) | 29 | 28 | 96.6 (90.0-100) |
| Kambia | 300 | 141 | 46.7 (33.2-60.1) | 77 | 43 | 54.4 (47.4-62.9) | 67 | 85.9 (76.7-95.1) | 21 | 20 | 95.2 (86.9-100) |
| Kenema | 309 | 238 | 77.0 (64.8-89.3) | 96 | 52 | 54.2 (42.3-66.1) | 91 | 94.8 (90.7-98.9) | 38 | 37 | 97.4 (92.3-100) |
| Koinadugu | 347 | 203 | 58.5 (47.6-69.4) | 110 | 81 | 73.6 (64.0-83.3) | 37 | 33.6 (19.1-48.1) | 38 | 37 | 97.4 (92.5-100) |
| Kono | 329 | 138 | 41.9 (27.5-56.4) | 45 | 31 | 68.9 (53.5-84.3) | 33 | 73.3 (60.1-86.6) | 43 | 34 | 79.1 (63.7-94.4) |
| Moyamba | 286 | 161 | 56.3 (39.8-72.8) | 65 | 43 | 66.2 (49.1-83.2) | 51 | 78.5 (66.3-90.6) | 28 | 27 | 96.4 (89.9-100) |
| Port Loko | 250 | 165 | 66.0 (53.0-79.0) | 53 | 34 | 64.2 (48.7-79.6) | 42 | 79.2 (60.4-98.1) | 28 | 27 | 96.4 (89.9-100) |
| Pujehun | 338 | 178 | 52.7 (31.8-73.5) | 111 | 68 | 61.3 (49.2-73.3) | 103 | 92.8 (88.1-99.3) | 35 | 34 | 97.1 (91.7-100) |
| Tonkolili | 332 | 114 | 34.6 (21.7-47.6) | 85 | 54 | 63.5 (53.4-73.6) | 75 | 88.2 (77.9-98.6) | 34 | 33 | 97.1 (91.3-100) |
| WA-Rural | 321 | 220 | 68.5 (55.8-81.2) | 94 | 62 | 66.0 (53.5-78.4) | 86 | 91.5 (86.0-97.0) | 25 | 24 | 96.0 (88.1-100) |
| WA-Slums | 335 | 185 | 55.2 (35.2-75.3) | 84 | 50 | 59.5 (47.1-71.9) | 75 | 89.3 (79.4-99.2) | 38 | 38 | 100.0 |
| WA-Urban | 315 | 188 | 59.7 (46.2-73.2) | 37 | 11 | 30.6 (14.9-46.2) | 25 | 69.4 (53.4-85.5) | 55 | 50 | 90.9 (82.6-99.3) |
| Total | 4550 | 2585 | 56.8 (52.8-60.9) | 1106 | 681 | 61.6 (58.0-65.1) | 891 | 80.6 (76.7-84.6) | 510 | 482 | 94.5 (92.2-96.8) |

Exclusive breastfeeding rate among the infants aged 0-5 months was 61.6% (95% CI: 58.0-65.1) nationally. A high proportion of the children (80.6%; 95% CI: 76.7-84.6) were fed on colostrums. The prevalence of continued breastfeeding at 1 year among the children aged 12-15 months was 94.5% (95% CI: 92.2-96.8). Table 36 shows the distribution of exclusive and continued key breastfeeding indicators by district, even though the disaggregated sample sizes are small and so interpretation at the national levels is recommended.

### 6.7.2    Complementary Feeding Practices

The national mean age at introduction of complementary foods was 5.3 (±2.2) months among children aged 6-23 months, with majority (57.9%) of the children introduced to solid, semi-solid or soft foods at the sixth month. The prevalence of timely introduction of complementary (solid, semi-solid or soft) foods among 6-8 months was 55.2% (95% CI: 49.4-61.0). The mean feeding frequency was 2.5 (±1.2) times (Table 37).

**Table 37: Complementary Feeding Indicators, SLNNS 2017**

| Complementary Feeding Practices (6-23 Months) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (in months) at Introduction of solid, semi-solid or soft foods (6-23 months) | | | Feeding Frequency | | | Timely Introduction (6-8 months) of solid, semi-solid or soft foods | | | |
| District | N | Mean | SD | N | Mean | SD | N | n | % | 95% CI |
| Bo | 205 | 5.7 | 1.6 | 205 | 2.6 | .8 | 22 | 10 | 45.5 | 25.0-66.0 |
| Bombali | 210 | 4.5 | 2.3 | 210 | 2.2 | 1.0 | 23 | 12 | 52.2 | 32.6-71.7 |
| Bonthe | 229 | 5.5 | 2.1 | 229 | 2.8 | 1.5 | 23 | 13 | 56.5 | 32.7-80.3 |
| Kailahun | 195 | 6.1 | 1.6 | 195 | 2.5 | .9 | 19 | 13 | 68.4 | 49.2-87.7 |
| Kambia | 221 | 5.3 | 1.9 | 221 | 2.7 | 1.5 | 44 | 26 | 59.1 | 39.3-78.9 |
| Kenema | 213 | 5.4 | 2.7 | 213 | 2.3 | 1.0 | 28 | 14 | 50.0 | 24.1-75.9 |
| Koinadugu | 237 | 2.3 | 2.3 | 237 | 2.1 | 1.7 | 36 | 4 | 11.1 | 2.9-19.3 |
| Kono | 284 | 5.4 | 2.5 | 284 | 2.0 | .8 | 32 | 21 | 65.6 | 44.0-87.2 |
| Moyamba | 221 | 6.1 | 1.4 | 221 | 2.4 | .8 | 27 | 21 | 77.8 | 55.4-99.0 |
| Port Loko | 197 | 5.3 | 2.4 | 197 | 2.6 | 1.5 | 32 | 10 | 31.3 | 12.6-49.9 |
| Pujehun | 227 | 5.7 | 2.1 | 227 | 2.5 | 1.0 | 31 | 22 | 71.0 | 51.3-90.6 |
| Tonkolili | 248 | 5.3 | 2.2 | 248 | 2.2 | 1.1 | 33 | 21 | 63.6 | 45.3-82.0 |
| WA-Rural | 227 | 6.1 | 1.5 | 227 | 2.3 | .8 | 26 | 21 | 80.8 | 63.9-97.6 |
| WA-Slums | 251 | 5.8 | 1.4 | 251 | 2.9 | .9 | 23 | 12 | 52.2 | 31.6-72.8 |
| WA-Urban | 279 | 5.7 | 1.4 | 279 | 3.1 | 1.5 | 25 | 14 | 56.0 | 33.4-78.6 |
| Total | 3444 | 5.3 | 2.2 | 3444 | 2.5 | 1.2 | 424 | 234 | 55.2 | 49.4-61.0 |

### 6.7.3　Child Dietary Diversity among children (6-23 months)

The mean number of food groups consumed by children aged 6-23 months was 2.8 (±1.5) nationally out of a total of 6 food groups and varied from 1.5 (±1.5) food groups in Koinadugu to 3.5 (±1.5) food groups in Bombali. The proportion of children meeting minimum dietary diversity for their breastfeeding status was 29.7% (95% CI: 26.6-32.8) nationally and varied by district ranging from 5.5% in Koinadugu to 50% in Bombali.

**Table 38**: Dietary Diversity and Meal Frequency among children (6-23 months by district

| District | N | Number of food groups consumed | | Minimum Dietary Diversity | | | Minimum Meal Frequency | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | n | % | 95% CI | n | % | 95% CI |
| Bo | 205 | 3.3 | 1.3 | 95 | 46.3 | 33.8-58.9 | 120 | 58.5 | 48.6-68.5 |
| Bombali | 210 | 3.5 | 1.4 | 105 | 50.0 | 38.5-61.5 | 63 | 30.0 | 18.2-41.8 |
| Bonthe | 229 | 2.5 | 1.1 | 32 | 14.0 | 6.4-21.5 | 89 | 38.9 | 28.9-48.8 |
| Kailahun | 195 | 2.8 | 1.3 | 58 | 29.7 | 20.2-39.3 | 108 | 55.4 | 43.9-66.9 |
| Kambia | 221 | 2.3 | 1.3 | 44 | 19.8 | 11.3-28.4 | 106 | 47.7 | 37.8-57.7 |
| Kenema | 213 | 2.2 | 1.5 | 50 | 23.5 | 12.6-34.4 | 73 | 34.3 | 25.3-43.2 |
| Koinadugu | 237 | 1.5 | 1.3 | 13 | 5.5 | 0.5-10.5 | 111 | 46.8 | 35.5-58.2 |
| Kono | 284 | 3.4 | 1.6 | 123 | 43.3 | 29.1-57.5 | 62 | 21.8 | 13.1-30.5 |
| Moyamba | 221 | 3.2 | 1.6 | 86 | 38.9 | 26.0-51.8 | 95 | 43.0 | 32.7-53.3 |
| Port Loko | 197 | 2.3 | 1.1 | 27 | 13.7 | 7.1-20.3 | 91 | 46.2 | 37.5-54.9 |
| Pujehun | 227 | 2.0 | 1.3 | 32 | 14.1 | 7.7-20.5 | 117 | 51.5 | 41.0-62.1 |
| Tonkolili | 248 | 2.8 | 1.5 | 70 | 28.3 | 17.0-39.7 | 82 | 33.2 | 24.8-41.6 |
| WA-Rural | 227 | 3.4 | 1.2 | 108 | 47.6 | 36.6-58.6 | 71 | 31.3 | 21.6-41.0 |
| WA-Slums | 251 | 2.6 | 1.2 | 64 | 25.5 | 16.2-34.8 | 165 | 65.7 | 57.0-74.5 |
| WA-Urban | 279 | 3.4 | 1.5 | 116 | 41.6 | 30.7-52.4 | 165 | 59.1 | 49.7-68.6 |
| Total | 3444 | 2.8 | 1.5 | 1023 | 29.7 | 26.6-32.8 | 1518 | 44.1 | 41.2-46.9 |

The proportion of children meeting minimum meal frequency for their specific ages was 44.1% (95% CI: 41.2-46.9) nationally and varied by district ranging from 21.8% in Kono to 58.5% in Bo district (Table 38).

The consumption of animal source foods was generally good especially for meat, poultry and fish products (68.5%). However, consumption of Vitamin A rich foods (yellow or orange coloured fruits & vegetables) was poor at 13.9% nationally (Figure 10).

Table 39 shows the diversity and consumption of the various food groups among assessed children (6-23) months old by district and nationally. Fig 6.11 summarizes the national rates for key IYCF indicators.

**Table 39**: Consumption of different food groups among children (6-23 months by district

| District | | Cereals, roots & tubers | | Legumes, nuts & pulses | | Dairy products | | Meat, poultry & fish | | Vitamin A_rich fruits & vegetables | | Other_fruits & vegetables | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | n | % | n | % | n | % | n | % | n | % | n | % |
| Bo | 205 | 188 | 91.7 | 142 | 69.3 | 127 | 62.0 | 118 | 57.6 | 42 | 20.5 | 62 | 30.2 |
| Bombali | 210 | 198 | 94.3 | 172 | 81.9 | 92 | 43.8 | 164 | 78.1 | 58 | 27.6 | 55 | 26.2 |
| Bonthe | 229 | 214 | 93.4 | 104 | 45.4 | 61 | 26.6 | 152 | 66.4 | 13 | 5.7 | 31 | 13.5 |
| Kailahun | 195 | 174 | 89.2 | 106 | 54.4 | 67 | 34.4 | 112 | 57.4 | 32 | 16.4 | 58 | 29.7 |
| Kambia | 222 | 189 | 85.1 | 111 | 50.0 | 52 | 23.4 | 94 | 42.3 | 17 | 7.7 | 42 | 18.9 |
| Kenema | 213 | 163 | 76.5 | 98 | 46.0 | 34 | 16.0 | 108 | 50.7 | 44 | 20.7 | 22 | 10.3 |
| Koinadugu | 237 | 113 | 47.7 | 110 | 46.4 | 54 | 22.8 | 49 | 20.7 | 8 | 3.4 | 16 | 6.8 |
| Kono | 284 | 268 | 94.4 | 198 | 69.7 | 124 | 43.7 | 236 | 83.1 | 80 | 28.2 | 66 | 23.2 |
| Moyamba | 221 | 168 | 76.0 | 119 | 53.8 | 108 | 48.9 | 164 | 74.2 | 50 | 22.6 | 90 | 40.7 |
| Port Loko | 197 | 175 | 88.8 | 88 | 44.7 | 47 | 23.9 | 105 | 53.3 | 28 | 14.2 | 12 | 6.1 |
| Pujehun | 227 | 185 | 81.5 | 90 | 39.6 | 38 | 16.7 | 102 | 44.9 | 9 | 4.0 | 38 | 16.7 |
| Tonkolili | 247 | 192 | 77.7 | 152 | 61.5 | 72 | 29.1 | 164 | 66.4 | 10 | 4.0 | 92 | 37.2 |
| WA-Rural | 227 | 215 | 94.7 | 145 | 63.9 | 95 | 41.9 | 187 | 82.4 | 28 | 12.3 | 94 | 41.4 |
| WA-Slums | 251 | 220 | 87.6 | 117 | 46.6 | 141 | 56.2 | 160 | 63.7 | 6 | 2.4 | 19 | 7.6 |
| WA-Urban | 279 | 245 | 87.8 | 144 | 51.6 | 193 | 69.2 | 213 | 76.3 | 52 | 18.6 | 89 | 31.9 |
| Total | 3444 | 2907 | 84.4 | 1896 | 55.1 | 1305 | 37.9 | 2128 | 61.8 | 477 | 13.9 | 786 | 22.8 |

**Figure 10: Food groups most consumed by children in 24 hr recall**

**Chart showing food groups most consumed by children in 24 hr recall**

| Food group | % of children (6-23 months) |
|---|---|
| Other fruits & vegetables | 22.8 |
| Vitamin A-rich fruits & vegetables | 13.9 |
| Meat, poultry & fish | 61.8 |
| Dairy products | 37.9 |
| Legumes, nuts & pulses | 55.1 |
| Cereals, roots & tubers | 84.4 |
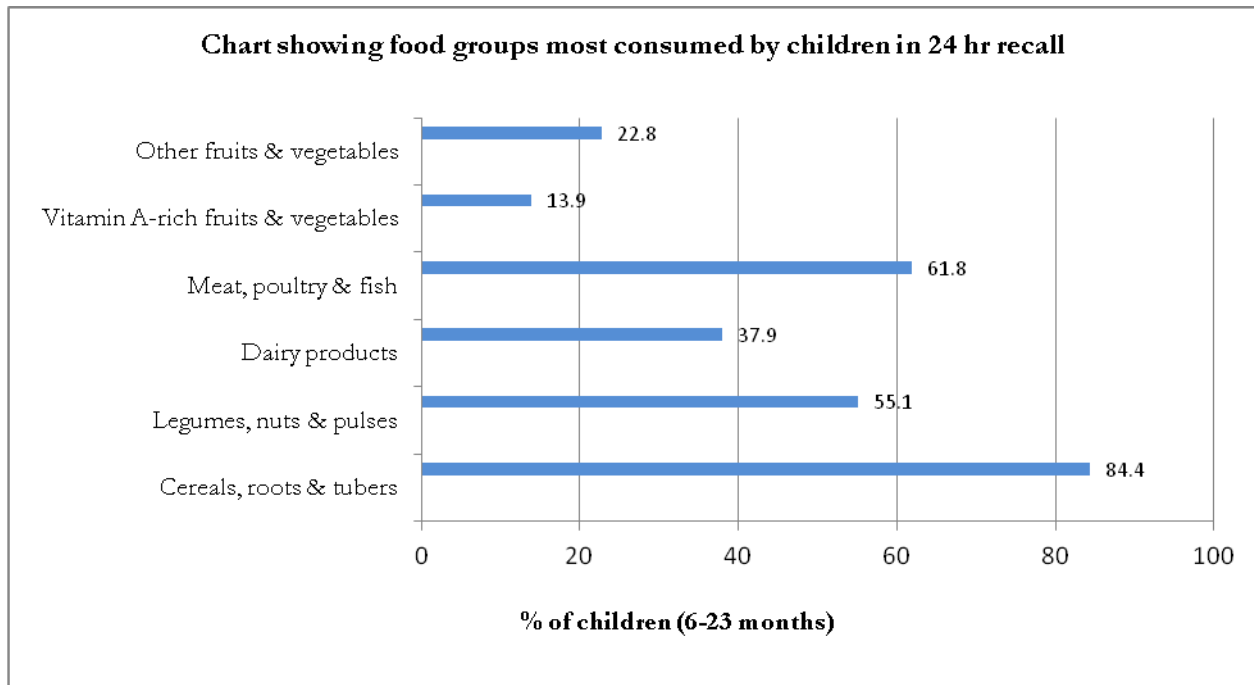
**Figure 11 National Rates of Key IYCF Indicators, SLNNS 2017**

**National Rates of Key IYCF Indicators, SLNNS 2017**

| Indicator | % of children (0-23 months) |
|---|---|
| Bottle Feeding | 23.3 |
| Timely Introduction to Complementary Feeding | 55.2 |
| Minimum Meal Frequency | 44.1 |
| Child Minimum Dietray Diversity | 29.7 |
| Ever Breast Fed | 99.1 |
| Continued Breast Feeding at 1 Year | 94.5 |
| Exclusive Breast Feeding | 61.6 |
| Colostrums Feeding | 80.6 |
| Timely/Early Initiation to breastfeeding | 56.8 |
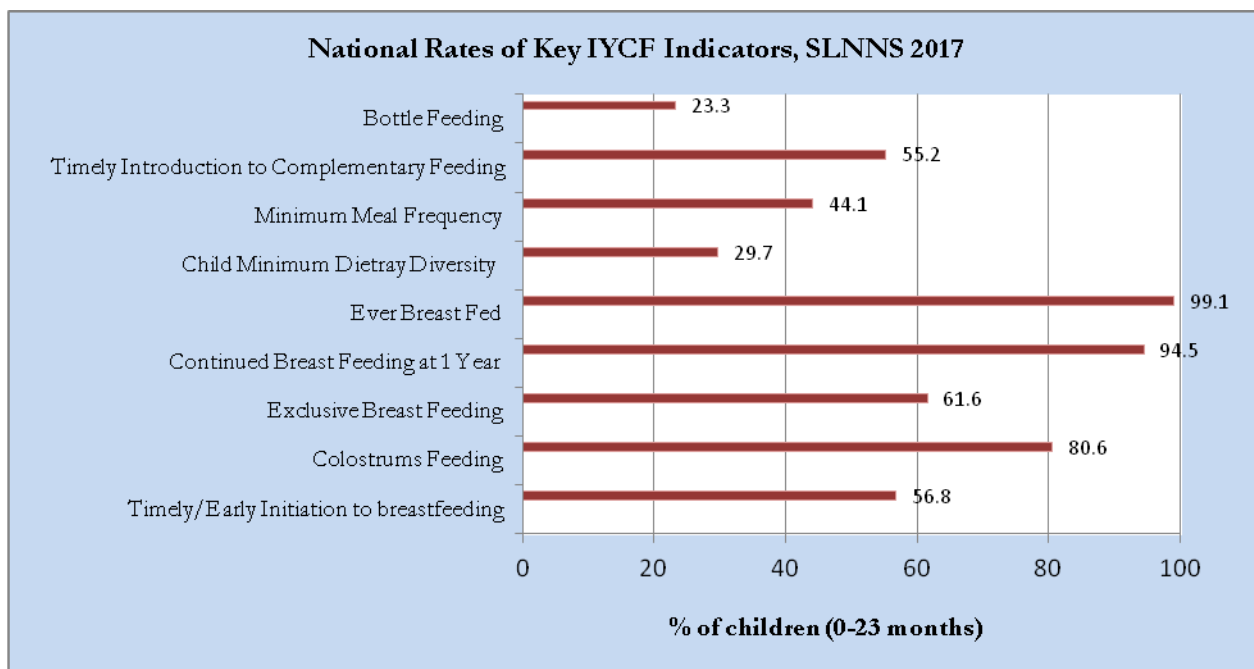
### 6.8    Food Security & Livelihoods

#### 6.8.1  Households' Cultivation, Livestock Ownership and Staple Foods

A total number of 9,469 households were assessed for food security and livelihoods, of which 17.7% were female headed. Nearly half (48.0%; 95% CI: 44.4-51.6) of the assessed households reported to have cultivated in the recent/current season, with the least proportion (0.4%) found in the Western Area Slums as expected, and the highest proportion (81.7%) found in Kailahun district. Nationally 40.5% (95% CI: 37.3-43.7) of the assessed households owned some livestock, again with proportion of households ranging from the least in Western Area Slums (4.3%) to 61.7% in Kambia.

Rice is the main staple food nationally (97.4%) and in all the districts with proportion of households reporting it as their staple ranging from 92.5% in Kambia to nearly all in the Western Area Urban (99.7%) and Slums (99.8%). Overall, the main source of the staple foods (Table 40) is market/shop purchases (67.3%; 95% CI: 63.8-70.8) followed by own production (28.3%; 95% CI: 25.1-31.6).

**Table 40:** **Household's Crop Cultivation, Livestock Ownership and Main Staple Foods**

| District | Sex of Household Head (N=9469) | | | | Cultivated in the recent season (N=9469) | | HH own Livestock (N=9469) | | Main Source of Staple Food | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | | | | | Rice as Staple food | Purchases | Own production |
| | n | % | n | % | n | % | n | % | % | % | % |
| Bo | 451 | 80.5 | 109 | 19.5 | 319 | 57.0 | 200 | 35.7 | 99.6 | 53.6 | 41.8 |
| Bombali | 486 | 78.6 | 132 | 21.4 | 198 | 32.0 | 247 | 40.0 | 99.7 | 64.2 | 32.3 |
| Bonthe | 473 | 77.3 | 139 | 22.7 | 133 | 21.7 | 166 | 27.1 | 92.6 | 56.2 | 28.3 |
| Kailahun | 556 | 84.8 | 100 | 15.2 | 536 | 81.7 | 314 | 47.9 | 95.3 | 71.6 | 27.3 |
| Kambia | 439 | 80.1 | 109 | 19.9 | 368 | 67.2 | 338 | 61.7 | 92.5 | 74.3 | 24.1 |
| Kenema | 495 | 74.0 | 174 | 26.0 | 260 | 38.9 | 153 | 22.9 | 98.2 | 52.5 | 43.2 |
| Koinadugu | 658 | 86.7 | 101 | 13.3 | 594 | 78.3 | 411 | 54.2 | 98.6 | 54.4 | 44.0 |
| Kono | 619 | 85.6 | 104 | 14.4 | 338 | 46.7 | 333 | 46.1 | 95.4 | 67.9 | 26.7 |
| Moyamba | 503 | 86.7 | 77 | 13.3 | 389 | 67.1 | 313 | 54.0 | 97.2 | 55.3 | 42.4 |
| Port Loko | 424 | 77.4 | 124 | 22.6 | 226 | 41.2 | 175 | 31.9 | 98.9 | 71.4 | 26.3 |
| Pujehun | 567 | 80.0 | 142 | 20.0 | 486 | 68.5 | 437 | 61.6 | 95.5 | 78.6 | 21.4 |
| Tonkolili | 578 | 90.5 | 61 | 9.5 | 498 | 77.9 | 355 | 55.6 | 99.5 | 65.3 | 31.6 |
| WA-Rural | 548 | 85.4 | 94 | 14.6 | 131 | 20.4 | 243 | 37.9 | 99.2 | 66.5 | 17.4 |
| WA-Slums | 474 | 85.7 | 79 | 14.3 | 2 | .4 | 24 | 4.3 | 99.8 | 95.8 | 1.8 |
| WA-Urban | 525 | 80.4 | 128 | 19.6 | 65 | 10.0 | 125 | 19.1 | 99.7 | 85.3 | 12.9 |
| National | 7796 | 82.3 | 1673 | 17.7 | 4543 | 48.0 | 3834 | 40.5 | 97.4 | 67.3% | 28.3% |

### 6.8.2 Households' Source of Income and Food Expenditures

Nationally, the households' main income sources in the last 30 days were sale of crops/farm produce (34.8%; 95% CI: 31.5-38.1) especially in the provinces/districts followed by petty trade (14.7%; 95% CI: 13.2-16.2), skilled labour (13.9%), salaried work (9.0%) and casual labour (8.1%) mostly in the towns (Figure 12). Some 5.0% of the assessed households relied on sale of fish as their main source of income and the remaining fraction (14.4%) relied on other sources such as sale of livestock and livestock products, sale of natural resources (charcoal, timber, grass, etc), sale of alcoholic brews, sale of food aid, family support, remittances, quarrying, motorbike (okader) riding, and pension. The proportions of the various sources of income varied from district to district (Table 41).

**Figure 12:** Household's Main Source of Income
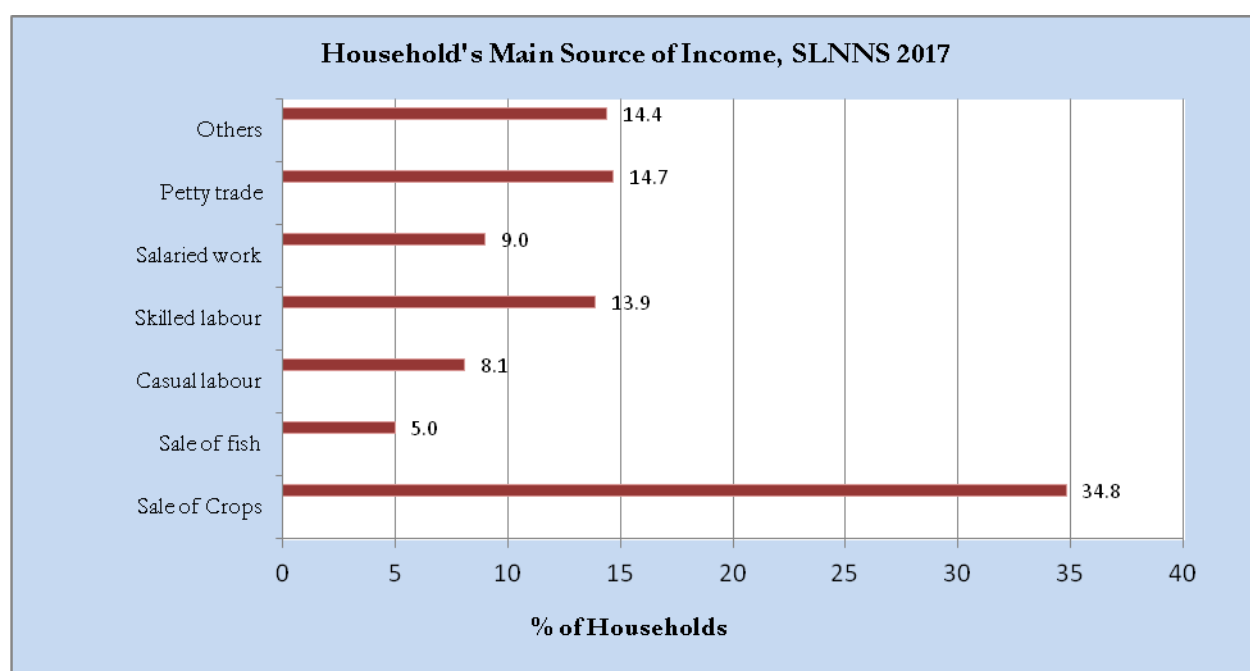


More than half (50.6%) of the assessed households spent more than half (>50%) of their household's expenditure on food (Table 42). The proportion of expenditures on food is especially high in the Western Area Slums with 40.7% of food expenditure constituting more than 65%.

**Table 41:** **Main Sources of Income & Livelihoods**

| District | Total | Sale of Crops | | Sale of fish | | Casual labour | | Skilled labour | | Salaried work | | Petty trading | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **N** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Bo | 560 | 286 | 51.1 | 22 | 3.9 | 18 | 3.2 | 59 | 10.5 | 49 | 8.8 | 66 | 11.8 | 60 | 10.7 |
| Bombali | 618 | 203 | 32.8 | 11 | 1.8 | 163 | 26.4 | 50 | 8.1 | 34 | 5.5 | 92 | 14.9 | 65 | 10.5 |
| Bonthe | 612 | 144 | 23.5 | 120 | 19.6 | 93 | 15.2 | 105 | 17.2 | 41 | 6.7 | 36 | 5.9 | 73 | 11.9 |
| Kailahun | 656 | 427 | 65.1 | 1 | .2 | 12 | 1.8 | 117 | 17.8 | 25 | 3.8 | 43 | 6.6 | 31 | 4.7 |
| Kambia | 548 | 202 | 36.9 | 3 | .5 | 32 | 5.8 | 99 | 18.1 | 33 | 6.0 | 107 | 19.5 | 72 | 13.1 |
| Kenema | 669 | 283 | 42.3 | 3 | .4 | 75 | 11.2 | 43 | 6.4 | 58 | 8.7 | 86 | 12.9 | 121 | 18.1 |
| Koinadugu | 759 | 374 | 49.3 | 3 | .4 | 56 | 7.4 | 43 | 5.7 | 30 | 4.0 | 97 | 12.8 | 156 | 20.6 |
| Kono | 723 | 194 | 26.8 | 5 | .7 | 77 | 10.7 | 176 | 24.3 | 58 | 8.0 | 89 | 12.3 | 124 | 17.2 |
| Moyamba | 580 | 277 | 47.8 | 45 | 7.8 | 39 | 6.7 | 29 | 5.0 | 27 | 4.7 | 88 | 15.2 | 75 | 12.9 |
| Port Loko | 548 | 267 | 48.7 | 39 | 7.1 | 27 | 4.9 | 68 | 12.4 | 25 | 4.6 | 76 | 13.9 | 46 | 8.4 |
| Pujehun | 709 | 203 | 28.6 | 20 | 2.8 | 38 | 5.4 | 105 | 14.8 | 41 | 5.8 | 61 | 8.6 | 241 | 34.0 |
| Tonkolili | 639 | 273 | 42.7 | 4 | .6 | 38 | 5.9 | 56 | 8.8 | 19 | 3.0 | 79 | 12.4 | 170 | 26.6 |
| WA-Rural | 642 | 130 | 20.2 | 114 | 17.8 | 50 | 7.8 | 101 | 15.7 | 78 | 12.1 | 104 | 16.2 | 65 | 10.1 |
| WA- Slums | 553 | 3 | .5 | 75 | 13.6 | 25 | 4.5 | 135 | 24.4 | 158 | 28.6 | 133 | 24.1 | 24 | 4.3 |
| WA-Urban | 653 | 32 | 4.9 | 13 | 2.0 | 28 | 4.3 | 129 | 19.8 | 174 | 26.6 | 236 | 36.1 | 41 | 6.3 |
| Total | 9469 | 3298 | 34.8 | 478 | 5.0 | 771 | 8.1 | 1315 | 13.9 | 850 | 9.0 | 1393 | 14.7 | 1364 | 14.4 |

**Table 42:** **Household Food Expenditures**

| District | Total | 0% | | 1-50% | | 51-65% | | >65% | |
|---|---|---|---|---|---|---|---|---|---|
| | **N** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Bo | 560 | 0 | 0.0 | 302 | 53.9 | 196 | 35.0 | 62 | 11.1 |
| Bombali | 618 | 0 | 0.0 | 388 | 62.8 | 134 | 21.7 | 96 | 15.5 |
| Bonthe | 612 | 1 | .2 | 250 | 40.8 | 240 | 39.2 | 121 | 19.8 |
| Kailahun | 656 | 0 | 0.0 | 211 | 32.2 | 345 | 52.6 | 100 | 15.2 |
| Kambia | 548 | 1 | .2 | 192 | 35.0 | 333 | 60.8 | 22 | 4.0 |
| Kenema | 669 | 2 | .3 | 264 | 39.5 | 174 | 26.0 | 229 | 34.2 |
| Koinadugu | 759 | 0 | 0.0 | 327 | 43.1 | 173 | 22.8 | 259 | 34.1 |
| Kono | 723 | 0 | 0.0 | 536 | 74.1 | 176 | 24.3 | 11 | 1.5 |
| Moyamba | 580 | 3 | .5 | 397 | 68.4 | 128 | 22.1 | 52 | 9.0 |
| Port Loko | 548 | 2 | .4 | 360 | 65.7 | 75 | 13.7 | 111 | 20.3 |
| Pujehun | 709 | 1 | .1 | 332 | 46.8 | 227 | 32.0 | 149 | 21.0 |
| Tonkolili | 639 | 0 | 0.0 | 281 | 43.8 | 292 | 45.5 | 69 | 10.7 |
| WA-Rural | 642 | 0 | 0.0 | 222 | 40.1 | 209 | 37.8 | 122 | 22.1 |
| WA- Slums | 553 | 0 | 0.0 | 144 | 22.5 | 235 | 36.8 | 260 | 40.7 |
| WA-Urban | 653 | 0 | 0.0 | 455 | 69.7 | 171 | 26.2 | 27 | 4.1 |
| Total | 9469 | 10 | .1 | 4661 | 49.2 | 3108 | 32.8 | 1690 | 17.8 |

### 6.8.3    Households' Food Consumption & Dietary Diversity

The mean household dietary diversity score (HDDS) was **5.3** (±2.3) food groups out of a possible maximum of 12 food groups.  When disaggregated by district in 2017 the mean HDDS varied with mean HDDS ranging from 4.2 (±2.2) in Bo to 7.3 (±2.1) in Pujehun as in (Figure 13).

The dietary diversity was characterized by frequent consumption of cereals (94.5%), fish (84.0%), fats/oils (77.4%) and vegetables (74.3%) [Figure 14].

**Figure 13**: *Changes in Mean Household Dietary Diversity Score (HDDS) for 2014 and 2017*
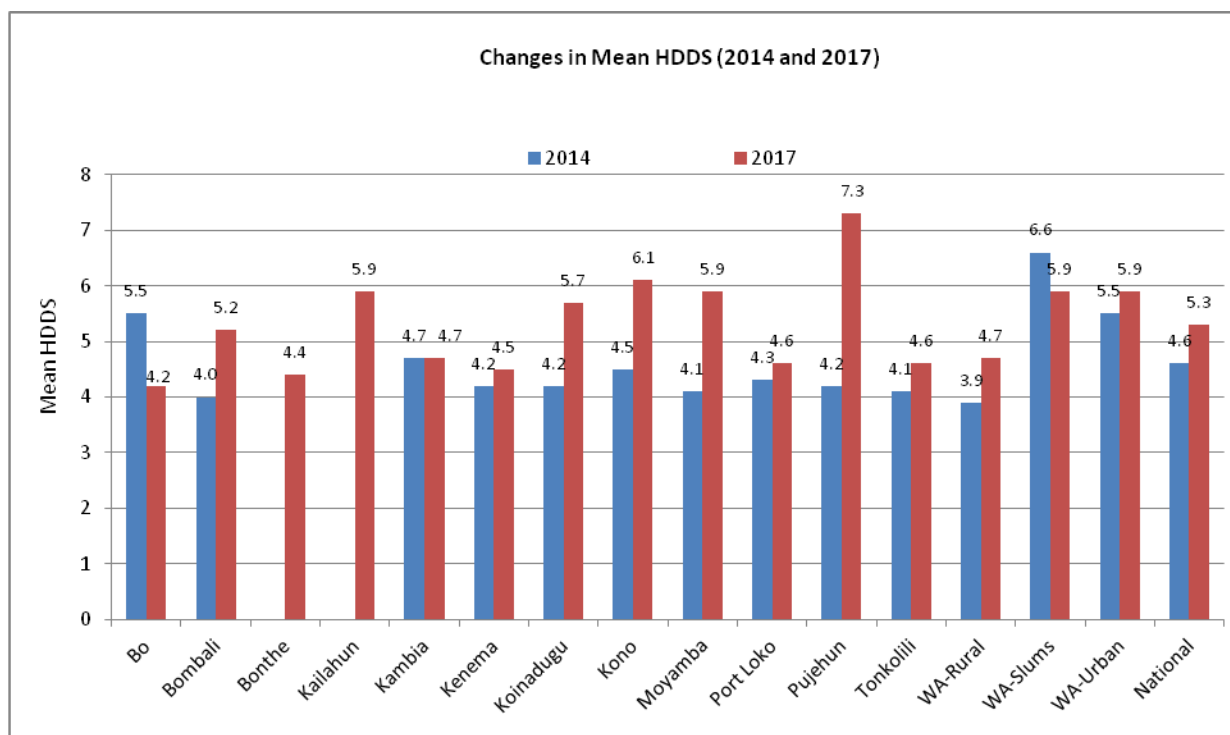


In this study, FCS and CSI results were not adequately collected and presented within the Consolidated Approach for Reporting Indicators of Food Security (CARI) [8] food security console since limited data was collected on coping strategies and food expenditure indicators. Data collected on CSI was only sufficient to analyse reduced coping strategy index (rCSI), with more likely association to malnutrition.

---

[8] CARI is *a methodology for analysing and reporting the level of food insecurity within a population and replaces the old CFSVA methodololgy of classifying food security phase using FCS alone.*

**Figure 14**: *Household Dietary Diversity based on 12 food groups, SLNNS 2017*
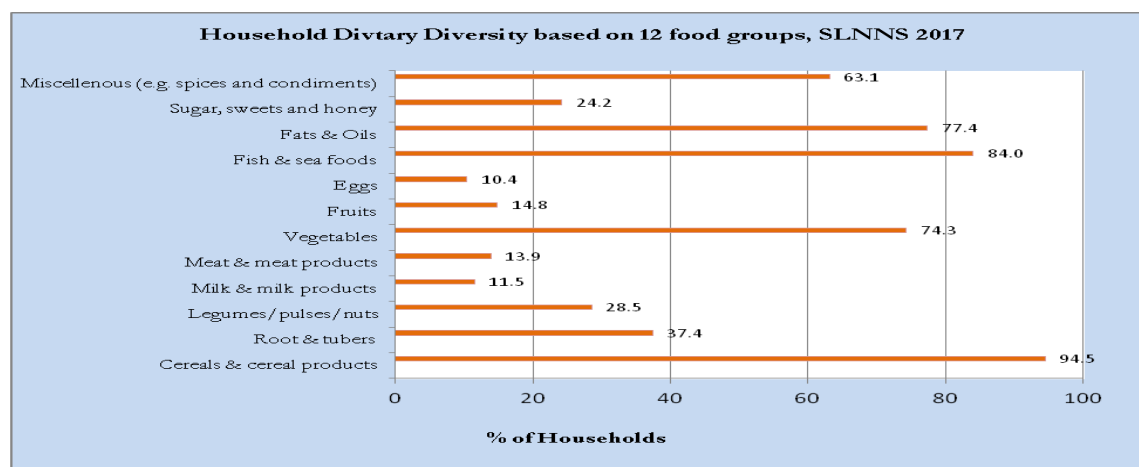


**6.8.4  Household's Hunger, Livelihood Shocks and Coping Strategies**

A significant proportion (18.7%; 95% CI: 16.4-21.0) of the assessed households reported experiencing some shock(s) in the preceding one year (Table 43), mostly in the form of high cost/prices of food (26%), loss of a close family member (20.4%), insecurity (15.4%), floods (9.4%), water scarcity (5.1%), crop failures (4.1%) and/or land/mud slides (1.2%).

**Table 43**: Households Experience of Shocks in the preceding 12 Months

| District | N | Experienced Shock | | Insecurity | | High food prices | | Floods | | Human Sickness | | Water scarcity | | Bereavement | | Crop failure | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Bo | 560 | 98 | 17.5 | 3 | 3.1 | 54 | 55.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 4.1 | 0 | 0.0 |
| Bombali | 618 | 143 | 23.1 | 39 | 27.3 | 14 | 9.8 | 0 | 0.0 | 74 | 51.7 | 3 | 2.1 | 43 | 30.1 | 4 | 2.8 |
| Bonthe | 612 | 66 | 10.8 | 3 | 4.5 | 18 | 27.3 | 3 | 4.5 | 35 | 53.0 | 1 | 1.5 | 15 | 22.7 | 5 | 7.6 |
| Kailahun | 656 | 271 | 41.3 | 55 | 20.3 | 97 | 35.8 | 6 | 2.2 | 14 | 5.2 | 22 | 8.1 | 16 | 5.9 | 13 | 4.8 |
| Kambia | 548 | 94 | 17.2 | 18 | 19.1 | 48 | 51.1 | 7 | 7.4 | 15 | 16.0 | 1 | 1.1 | 37 | 39.4 | 8 | 8.5 |
| Kenema | 669 | 59 | 8.8 | 2 | 3.4 | 5 | 8.5 | 3 | 5.1 | 36 | 61.0 | 2 | 3.4 | 18 | 30.5 | 6 | 10.2 |
| Koinadugu | 759 | 61 | 8.0 | 2 | 3.3 | 14 | 23.0 | 1 | 1.6 | 7 | 11.5 | 0 | 0.0 | 7 | 11.5 | 13 | 21.3 |
| Kono | 723 | 108 | 14.9 | 52 | 48.1 | 9 | 8.3 | 0 | 0.0 | 30 | 27.8 | 0 | 0.0 | 37 | 34.3 | 1 | .9 |
| Moyamba | 580 | 176 | 30.3 | 29 | 16.5 | 20 | 11.4 | 2 | 1.1 | 89 | 50.6 | 0 | 0.0 | 40 | 22.7 | 5 | 2.8 |
| Port Loko | 548 | 159 | 29.0 | 1 | .6 | 3 | 1.9 | 0 | 0.0 | 135 | 84.9 | 0 | 0.0 | 29 | 18.2 | 1 | .6 |
| Pujehun | 709 | 61 | 8.6 | 15 | 24.6 | 42 | 68.9 | 4 | 6.6 | 2 | 3.3 | 21 | 34.4 | 0 | 0.0 | 9 | 14.8 |
| Tonkolili | 639 | 151 | 23.6 | 11 | 7.3 | 33 | 21.9 | 3 | 2.0 | 61 | 40.4 | 0 | 0.0 | 53 | 35.1 | 8 | 5.3 |
| WA-Rural | 642 | 84 | 13.1 | 23 | 27.4 | 39 | 46.4 | 15 | 17.9 | 23 | 27.4 | 18 | 21.4 | 22 | 26.2 | 0 | 0.0 |
| WA-Slums | 553 | 153 | 27.7 | 11 | 7.2 | 58 | 37.9 | 104 | 68.0 | 9 | 5.9 | 23 | 15.0 | 4 | 2.6 | 0 | 0.0 |
| WA-Urban | 653 | 84 | 12.9 | 9 | 10.7 | 5 | 6.0 | 18 | 21.4 | 20 | 23.8 | 0 | 0.0 | 36 | 42.9 | 0 | 0.0 |
| Total | 9469 | 1768 | 18.7 | 273 | 15.4 | 459 | 26.0 | 166 | 9.4 | 550 | 31.1 | 91 | 5.1 | 361 | 20.4 | 73 | 4.1 |

On a 4-week recall household hunger scale (0-6 pts), the national mean HHS was 0.7 (±1.21) with 21% (95% CI: 18.4-23.7) of the assessed households experiencing some moderate hunger (HHS of 2-3) and 1.6% (95% CI: 0.7-2.4) reportedly experiencing severe hunger. As shown on Table 44, Kailahun, Moyamba, Bo and Port Loko reportedly experienced most of some moderate to severe hunger.

**Table 44: Households Experience of Hunger the preceding 4 Weeks**

| Household Hunger Scale | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| District | Total | HHS | | None or light hunger (HHS=0-1) | | Moderate hunger (HHS=2-3) | | Severe hunger (HHS = 4-6) | |
| | N | Mean | SD | n | % | n | % | n | % |
| Bo | 560 | 1.01 | 1.11 | 332 | 59.3 | 228 | 40.7 | 0 | 0.0 |
| Bombali | 618 | .61 | 0.94 | 507 | 82.0 | 110 | 17.8 | 1 | .2 |
| Bonthe | 612 | .36 | 0.95 | 541 | 88.4 | 71 | 11.6 | 0 | 0.0 |
| Kailahun | 656 | 1.37 | 1.19 | 291 | 44.4 | 362 | 55.2 | 3 | .5 |
| Kambia | 548 | .45 | 0.97 | 458 | 83.6 | 90 | 16.4 | 0 | 0.0 |
| Kenema | 669 | .47 | 1.09 | 568 | 84.9 | 98 | 14.6 | 3 | .4 |
| Koinadugu | 759 | .78 | 1.29 | 567 | 74.7 | 170 | 22.4 | 22 | 2.9 |
| Kono | 723 | .54 | 1.02 | 619 | 85.6 | 98 | 13.6 | 6 | .8 |
| Moyamba | 580 | 1.08 | 1.29 | 392 | 67.6 | 177 | 30.5 | 11 | 1.9 |
| Port Loko | 548 | 1.55 | 2.12 | 337 | 61.5 | 134 | 24.5 | 77 | 14.1 |
| Pujehun | 709 | .48 | 1.05 | 605 | 85.3 | 102 | 14.4 | 2 | .3 |
| Tonkolili | 639 | .68 | 1.20 | 492 | 77.0 | 129 | 20.2 | 18 | 2.8 |
| WA-Rural | 642 | .13 | 0.47 | 623 | 97.0 | 19 | 3.0 | 0 | 0.0 |
| WA-Slums | 553 | .73 | 1.14 | 429 | 77.6 | 120 | 21.7 | 4 | .7 |
| WA-Urban | 653 | .43 | 0.97 | 568 | 87.0 | 85 | 13.0 | 0 | 0.0 |
| Total | 9469 | .70 | 1.21 | 7329 | 77.4 | 1993 | 21.0 | 147 | 1.6 |

About one in five (21.3%; 95% CI: 18.7-24.0) of the assessed households reported experiencing some food shortage and/or income to buy food and applying at least one coping strategy in the previous one month (Table 45). The coping strategies reportedly adopted by the households most frequently included relying on less preferred/cheaper foods (95.5%), limiting portion size at mealtime (89.2%) and reducing the number of meals in a day (82.7%). The mean reduced coping strategy index (rCSI) was 3.2 (±7.3). Although a majority of the households reported applying no or low (79.9%) coping strategy, a significant proportion still reported applying medium to high level of coping.

**Table 45**: Households Coping Strategies during food stress in the preceding one month

| District | Total | Coped | | rCSI | | Non or low coping (rCSI of 0-3) | | Medium coping (rCSI of 4-9) | | High coping (rCSI>=10) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | n | % | Mean | SD | n | % | n | % | n | % |
| Bo | 560 | 89 | 15.9 | 1.7 | 4.3 | 473 | 84.5 | 53 | 9.5 | 34 | 6.1 |
| Bombali | 618 | 171 | 27.7 | 3.2 | 7.2 | 471 | 76.2 | 76 | 12.3 | 71 | 11.5 |
| Bonthe | 612 | 75 | 12.3 | 1.1 | 3.7 | 543 | 88.7 | 44 | 7.2 | 25 | 4.1 |
| Kailahun | 656 | 283 | 43.1 | 5.1 | 7.1 | 380 | 57.9 | 123 | 18.8 | 153 | 23.3 |
| Kambia | 548 | 113 | 20.6 | 3.4 | 7.9 | 442 | 80.7 | 20 | 3.6 | 86 | 15.7 |
| Kenema | 667 | 73 | 10.9 | 2.3 | 7.0 | 598 | 89.4 | 2 | .3 | 69 | 10.3 |
| Koinadugu | 759 | 64 | 8.4 | 1.1 | 4.0 | 698 | 92.0 | 14 | 1.8 | 47 | 6.2 |
| Kono | 723 | 129 | 17.8 | 2.1 | 5.5 | 616 | 85.2 | 32 | 4.4 | 75 | 10.4 |
| Moyamba | 580 | 223 | 38.4 | 7.4 | 11.1 | 371 | 64.0 | 26 | 4.5 | 183 | 31.6 |
| Port Loko | 548 | 213 | 38.9 | 5.5 | 7.4 | 331 | 60.4 | 37 | 6.8 | 180 | 32.8 |
| Pujehun | 709 | 106 | 15.0 | 2.6 | 6.5 | 602 | 84.9 | 8 | 1.1 | 99 | 14.0 |
| Tonkolili | 639 | 195 | 30.5 | 6.1 | 10.9 | 452 | 70.7 | 23 | 3.6 | 164 | 25.7 |
| WA-Rural | 642 | 58 | 9.0 | 2.1 | 7.4 | 589 | 91.7 | 6 | .9 | 47 | 7.3 |
| WA-Slums | 553 | 123 | 22.2 | 3.3 | 6.8 | 435 | 78.7 | 21 | 3.8 | 97 | 17.5 |
| WA-Urban | 653 | 104 | 15.9 | 2.0 | 5.4 | 559 | 85.6 | 35 | 5.4 | 59 | 9.0 |
| Total | 9467 | 2019 | 21.3 | 3.2 | 7.3 | 7560 | 79.8 | 520 | 5.5 | 1389 | 14.7 |

## 6.9    Water, Sanitation & Hygiene (WASH)

### 6.9.1  Water Access & Quality

Most households assessed reportedly draw their drinking water from protected sources (Table 46) considered to be safe (68.6%; 95% CI: 64.8-72.3) including boreholes (24.9%), household/piped connection/tanker (22.1%) and protected shallow wells (18.8%). Many other households however draw their drinking water from unprotected sources such as rivers/streams (20.2%), open shallow wells (6.4%) or pond/dam (1.7%).

**Table 46**: Households Main Source of drinking water

| District | Total | Borehole/ tube well | | Protected shallow well | | Open shallow well | | Protected spring | | River/ stream | | Household connection/ Stand pipe/ Tanker | | Dam/ pond | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Bo | 560 | 193 | 34.5 | 231 | 41.3 | 21 | 3.8 | 0 | 0.0 | 107 | 19.1 | 8 | 1.4 | 0 | 0.0 | 0 | 0.0 |
| Bombali | 618 | 323 | 52.3 | 69 | 11.2 | 52 | 8.4 | 10 | 1.6 | 92 | 14.9 | 60 | 9.7 | 1 | .2 | 11 | 1.8 |
| Bonthe | 612 | 224 | 36.6 | 103 | 16.8 | 93 | 15.2 | 36 | 5.9 | 127 | 20.8 | 2 | .3 | 0 | 0.0 | 27 | 4.4 |
| Kailahun | 656 | 180 | 27.4 | 121 | 18.4 | 52 | 7.9 | 25 | 3.8 | 207 | 31.6 | 26 | 4.0 | 45 | 6.9 | 0 | 0.0 |
| Kambia | 548 | 116 | 21.2 | 116 | 21.2 | 31 | 5.7 | 1 | .2 | 130 | 23.7 | 133 | 24.3 | 0 | 0.0 | 21 | 3.8 |
| Kenema | 667 | 203 | 30.4 | 137 | 20.5 | 49 | 7.3 | 112 | 16.8 | 24 | 3.6 | 127 | 19.0 | 0 | 0.0 | 15 | 2.2 |
| Koinadugu | 759 | 112 | 14.8 | 121 | 15.9 | 22 | 2.9 | 26 | 3.4 | 239 | 31.5 | 232 | 30.6 | 0 | 0.0 | 7 | .9 |
| Kono | 723 | 270 | 37.3 | 169 | 23.4 | 53 | 7.3 | 0 | 0.0 | 124 | 17.2 | 39 | 5.4 | 1 | .1 | 67 | 9.3 |
| Moyamba | 580 | 193 | 33.3 | 99 | 17.1 | 48 | 8.3 | 1 | .2 | 239 | 41.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Port Loko | 548 | 158 | 28.8 | 154 | 28.1 | 53 | 9.7 | 0 | 0.0 | 149 | 27.2 | 24 | 4.4 | 0 | 0.0 | 10 | 1.8 |
| Pujehun | 709 | 112 | 15.8 | 24 | 3.4 | 13 | 1.8 | 0 | 0.0 | 164 | 23.1 | 396 | 55.9 | 0 | 0.0 | 0 | 0.0 |
| Rural | 642 | 141 | 22.0 | 141 | 22.0 | 58 | 9.0 | 9 | 1.4 | 106 | 16.5 | 165 | 25.7 | 19 | 3.0 | 3 | .5 |
| Slums | 553 | 6 | 1.1 | 90 | 16.3 | 22 | 4.0 | 0 | 0.0 | 0 | 0.0 | 360 | 65.1 | 75 | 13.6 | 0 | 0.0 |
| Tonkolili | 639 | 122 | 19.1 | 144 | 22.5 | 23 | 3.6 | 3 | .5 | 191 | 29.9 | 136 | 21.3 | 19 | 3.0 | 1 | .2 |
| Urban | 653 | 6 | .9 | 65 | 10.0 | 15 | 2.3 | 35 | 5.4 | 13 | 2.0 | 382 | 58.5 | 0 | 0.0 | 137 | 21.0 |
| Total | 9467 | 2359 | 24.9 | 1784 | 18.8 | 605 | 6.4 | 258 | 2.7 | 1912 | 20.2 | 2090 | 22.1 | 160 | 1.7 | 299 | 3.2 |

Majority (78.3%; 95% CI: 75.3-81.2) takes less than 30 minutes to fetch water (return trip including queuing/ waiting) as recommended by SPHERE (2011). Majority (72.4%) of the assessed households that does not have access to safe/protected water does nothing and only 5.5% apply appropriate treatment (chlorination) to water before drinking (Table 47). Decanting (14.7%) is the most common treatment for drinking water, although apart from chlorination (5.5%) a few households also filter (4.6%), or boil (2.8%) water before drinking.

**Table 47: Households access to drinking water**

| District | Total | Household has access to safe water source | | | | HHs taking recommended time to access water | | | Treatment of Drinking Water | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No | | Yes | | | | | | Any treatment | | Appropriate Treatment | |
| | N | n | % | n | % | n | % | N | n | % | n | % | |
| Bo | 560 | 122 | 21.8 | 438 | 78.2 | 448 | 80.0 | 122 | 55 | 45.1 | 1 | .8 | |
| Bombali | 618 | 157 | 25.4 | 461 | 74.6 | 472 | 76.4 | 157 | 39 | 24.8 | 0 | 0.0 | |
| Bonthe | 612 | 248 | 40.5 | 364 | 59.5 | 554 | 90.5 | 248 | 18 | 7.3 | 0 | 0.0 | |
| Kailahun | 656 | 292 | 44.5 | 364 | 55.5 | 494 | 75.3 | 292 | 122 | 41.8 | 19 | 6.5 | |
| Kambia | 548 | 176 | 32.1 | 372 | 67.9 | 333 | 60.8 | 176 | 19 | 10.8 | 0 | 0.0 | |
| Kenema | 667 | 103 | 15.4 | 564 | 84.6 | 551 | 82.6 | 103 | 26 | 25.2 | 3 | 2.9 | |
| Koinadugu | 759 | 266 | 35.0 | 493 | 65.0 | 566 | 74.6 | 266 | 188 | 70.7 | 0 | 0.0 | |
| Kono | 723 | 246 | 34.0 | 477 | 66.0 | 588 | 81.3 | 246 | 92 | 37.4 | 27 | 11.0 | |
| Moyamba | 580 | 287 | 49.5 | 293 | 50.5 | 403 | 69.5 | 287 | 15 | 5.2 | 0 | 0.0 | |
| Port Loko | 548 | 216 | 39.4 | 332 | 60.6 | 397 | 72.4 | 216 | 33 | 15.3 | 0 | 0.0 | |
| Pujehun | 709 | 176 | 24.8 | 533 | 75.2 | 683 | 96.3 | 176 | 27 | 15.3 | 0 | 0.0 | |
| W. Rural | 642 | 238 | 37.2 | 401 | 62.8 | 574 | 89.8 | 238 | 24 | 10.1 | 0 | 0.0 | |
| Slums | 553 | 186 | 29.0 | 456 | 71.0 | 497 | 77.4 | 186 | 23 | 12.4 | 6 | 3.2 | |
| Tonkolili | 639 | 98 | 17.7 | 455 | 82.3 | 448 | 81.0 | 98 | 69 | 70.4 | 60 | 61.2 | |
| W. Urban | 653 | 165 | 25.3 | 488 | 74.7 | 403 | 61.7 | 165 | 71 | 43.0 | 48 | 29.1 | |
| Total | 9467 | 2976 | 31.4 | 6491 | 68.6 | 7411 | 78.3 | 2976 | 821 | 27.6 | 164 | 5.5 | |

Most households used 60 litres of water in a day, with a mean water use of 82.5 litres per day, excluding water for washing clothes (Table 48). All people should have safe and equitable access to a sufficient quantity of water for drinking and personal & domestic hygiene. Based on the size of household, most (61.5%; 95% CI: 58.6-64.4) of the assessed households have above the recommended average water requirement for drinking, cooking and personal hygiene of 15 litres/person/day in any household (SPHERE, 2011). However, distance to the water source, time taken to fetch water including queuing time, and number of water collecting and storage containers may limit access to sufficient quantity of water for household use among the remaining 38.5% households that do not meet the daily minimum water requirement.

**Table 48: Households Time to collect water and household Water Use**

| District | Total | Recommended Time | | HH Water Use (L/day) | | | Individual Water Use (L/px/day) | | Optimum Water Use (>=15 L/px/day) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **N** | **n** | **%** | **N** | **Mean** | **Median** | **Mean** | **SD** | **n** | **%** |
| Bo | 560 | 448 | 80.0 | 560 | 86.7 | 60.0 | 22.5 | 24.3 | 314 | 56.1 |
| Bombali | 618 | 472 | 76.4 | 618 | 66.3 | 60.0 | 16.3 | 7.2 | 387 | 62.6 |
| Bonthe | 612 | 554 | 90.5 | 611 | 64.9 | 60.0 | 19.1 | 11.2 | 402 | 65.8 |
| Kailahun | 656 | 494 | 75.3 | 656 | 100.4 | 80.0 | 26.3 | 24.2 | 387 | 59.0 |
| Kambia | 548 | 333 | 60.8 | 548 | 81.1 | 60.0 | 16.4 | 9.1 | 272 | 49.6 |
| Kenema | 667 | 551 | 82.6 | 667 | 98.0 | 80.0 | 27.2 | 15.0 | 609 | 91.3 |
| Koinadugu | 759 | 566 | 74.6 | 759 | 77.7 | 60.0 | 18.4 | 16.4 | 399 | 52.6 |
| Kono | 723 | 588 | 81.3 | 723 | 74.4 | 60.0 | 15.0 | 7.3 | 386 | 53.4 |
| Moyamba | 580 | 403 | 69.5 | 579 | 63.9 | 60.0 | 15.0 | 8.9 | 290 | 50.1 |
| Port Loko | 548 | 397 | 72.4 | 548 | 136.6 | 100.0 | 28.0 | 22.0 | 386 | 70.4 |
| Pujehun | 709 | 683 | 96.3 | 709 | 83.6 | 60.0 | 21.3 | 12.1 | 436 | 61.5 |
| WA-Rural | 642 | 574 | 89.8 | 639 | 66.1 | 60.0 | 15.7 | 7.6 | 334 | 52.3 |
| WA-Slums | 553 | 497 | 77.4 | 642 | 68.1 | 60.0 | 19.2 | 10.8 | 403 | 62.8 |
| Tonkolili | 639 | 448 | 81.0 | 553 | 99.5 | 80.0 | 28.0 | 21.1 | 438 | 79.2 |
| Urban | 653 | 403 | 61.7 | 653 | 78.5 | 60.0 | 18.1 | 11.9 | 378 | 57.9 |
| Total | 9467 | 7411 | 78.3 | 9465 | 82.5 | 60.0 | 20.3 | 15.7 | 5821 | 61.5 |

### 6.9.2   Access to Sanitation Facilities

Only 19.8% (95% CI: 16.9-22.8) of the assessed households nationally reported having access to improved sanitation facility (latrine/toilet), mostly in Western Area Urban (56.8%) and Bombali (45.1%), so most of the assessed households especially in the rural provinces and urban slums lack access to sanitation facilities (Table 49). Most households use open hole/bucket for defecation (61.7%) or bush (21.6%).

**Table 49:** **Households Access to Sanitation Facilities**

| District | | Bush/forest | | Open field | | Open hole/bucket | | Latrine/Toilet | |
|---|---|---|---|---|---|---|---|---|---|
| | N | n | % | n | % | n | % | n | % |
| Bo | 560 | 67 | 12.0 | 6 | 1.1 | 489 | 87.3 | 53 | 9.5 |
| Bombali | 618 | 118 | 19.1 | 12 | 1.9 | 339 | 54.9 | 279 | 45.1 |
| Bonthe | 612 | 275 | 44.9 | 36 | 5.9 | 280 | 45.8 | 76 | 12.4 |
| Kailahun | 656 | 264 | 40.2 | 25 | 3.8 | 398 | 60.7 | 15 | 2.3 |
| Kambia | 548 | 88 | 16.1 | 76 | 13.9 | 285 | 52.0 | 122 | 22.3 |
| Kenema | 667 | 52 | 7.8 | 6 | .9 | 481 | 72.1 | 181 | 27.1 |
| Koinadugu | 759 | 61 | 8.0 | 7 | .9 | 629 | 82.9 | 149 | 19.6 |
| Kono | 723 | 123 | 17.0 | 0 | 0.0 | 505 | 69.8 | 199 | 27.5 |
| Moyamba | 580 | 266 | 45.9 | 76 | 13.1 | 281 | 48.4 | 8 | 1.4 |
| Port Loko | 548 | 221 | 40.3 | 182 | 33.2 | 301 | 54.9 | 38 | 6.9 |
| Pujehun | 709 | 277 | 39.1 | 79 | 11.1 | 274 | 38.6 | 97 | 13.7 |
| Tonkolili | 639 | 138 | 21.6 | 110 | 17.2 | 453 | 70.9 | 34 | 5.3 |
| WA-Rural | 642 | 70 | 10.9 | 47 | 7.3 | 453 | 70.6 | 152 | 23.7 |
| WA-Slums | 553 | 14 | 2.5 | 73 | 13.2 | 391 | 70.7 | 105 | 19.0 |
| WA-Urban | 653 | 13 | 2.0 | 15 | 2.3 | 282 | 43.2 | 371 | 56.8 |
| Total | 9467 | 2047 | 21.6% | 750 | 7.9% | 5841 | 61.7 | 1879 | 19.8 |

### 6.9.3   Hygiene Practices

Most households have their members wash hands after defecation (96.0%), however, less than half of the assessed households reportedly have their members wash their hands before eating (45.7%), before cooking (43.3%) and where applicable before cleaning baby's bottom after defecation (22.8%) with the rates varying from district to district (Table 50). Majority (72.0%; 95% CI: 68.9-75.0) of the assessed households reported using soap while washing hands. However, only 30.6% (95% CI: 27.0-34.2) of the households had their members consistently wash their hands at all the three critical points (after defecation, before eating and before cooking/preparing food).

**Table 50**: Household members' hand washing practices

| Hand Washing & Hygiene Practices | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| District | N | after defecation | | before eating | | after cleaning baby | | before cooking | | Other times (e.g. before milking) | | Use soap for hand washing | | Wash hands at 3 critical points | |
| | | n | % | n | % | n | % | n | % | n | % | n | % | N | % |
| Bo | 560 | 558 | 99.6 | 73 | 13.0 | 48 | 8.6 | 108 | 19.3 | 0 | 0.0 | 340 | 60.7 | 39 | 7.0 |
| Bombali | 618 | 609 | 98.5 | 452 | 73.1 | 118 | 19.1 | 373 | 60.4 | 5 | .8 | 467 | 75.6 | 360 | 58.3 |
| Bonthe | 612 | 576 | 94.1 | 213 | 34.8 | 63 | 10.3 | 127 | 20.8 | 6 | 1.0 | 338 | 55.2 | 69 | 11.3 |
| Kailahun | 656 | 649 | 98.9 | 207 | 31.6 | 17 | 2.6 | 93 | 14.2 | 2 | .3 | 443 | 67.5 | 38 | 5.8 |
| Kambia | 548 | 514 | 93.8 | 93 | 17.0 | 75 | 13.7 | 203 | 37.0 | 3 | .5 | 327 | 59.7 | 52 | 9.5 |
| Kenema | 667 | 618 | 92.7 | 207 | 31.0 | 124 | 18.6 | 232 | 34.8 | 41 | 6.1 | 472 | 70.8 | 119 | 17.8 |
| Koinadugu | 759 | 750 | 98.8 | 381 | 50.2 | 275 | 36.2 | 345 | 45.5 | 174 | 22.9 | 506 | 66.7 | 317 | 41.8 |
| Kono | 723 | 717 | 99.2 | 422 | 58.4 | 166 | 23.0 | 368 | 50.9 | 9 | 1.2 | 501 | 69.3 | 322 | 44.5 |
| Moyamba | 580 | 579 | 99.8 | 340 | 58.6 | 227 | 39.1 | 426 | 73.4 | 135 | 23.3 | 524 | 90.3 | 331 | 57.1 |
| Port Loko | 548 | 449 | 81.9 | 237 | 43.2 | 16 | 2.9 | 106 | 19.3 | 1 | .2 | 294 | 53.6 | 24 | 4.4 |
| Pujehun | 709 | 691 | 97.5 | 544 | 76.7 | 338 | 47.7 | 465 | 65.6 | 58 | 8.2 | 614 | 86.6 | 429 | 60.5 |
| Tonkolili | 639 | 566 | 88.6 | 301 | 47.1 | 275 | 43.0 | 384 | 60.1 | 154 | 24.1 | 432 | 67.6 | 256 | 40.1 |
| WA-Rural | 642 | 624 | 97.2 | 190 | 29.6 | 92 | 14.3 | 239 | 37.2 | 33 | 5.1 | 412 | 64.2 | 121 | 18.8 |
| WA-Slums | 553 | 545 | 98.6 | 392 | 70.9 | 150 | 27.1 | 287 | 51.9 | 4 | .7 | 539 | 97.5 | 233 | 42.1 |
| WA-Urban | 653 | 647 | 99.1 | 272 | 41.7 | 177 | 27.1 | 346 | 53.0 | 9 | 1.4 | 604 | 92.5 | 189 | 28.9 |
| Total | 9467 | 9092 | 96.0 | 4324 | 45.7 | 2161 | 22.8 | 4102 | 43.3 | 634 | 6.7 | 6813 | 72.0 | 2899 | 30.6 |

## 7.   DISCUSSION

### 7.1    Nutrition Situation

The prevalence of global acute malnutrition (GAM) rate of **5.1%** (95%CI: 4.6-5.6), moderate acute malnutrition of **4.0%** (95% CI: 3.6-4.5) and severe acute malnutrition (SAM) rate (WHZ<-3 or edema) of **1.0%** (95%CI: 0.8-1.3) indicate a *poor* nutrition situation phase (GAM rate of 5.0-9.9%) of malnutrition in the country's population according to WHO classification (Table 51). When compared to the immediate past assessment of 2014, the results indicate a slight deterioration from the *acceptable* phase with respective GAM, MAM and SAM rates of 4.7% (95% CI: 4.3-5.2), 3.7% (95% CI: 3.3-4.1) and 1.0% (95% CI: 0.9-1.2), though the increase in GAM rates is not statistically significant. It is important to note that, this difference was not significant even after accounting for (leaving out) two districts (Bonthe and Kailahun) that were not assessed in 2014. It is also notable that the national point prevalence for SAM remained the same, but the slight increase was observed in the MAM rates. After adjusting for the two districts, the national GAM, MAM and SAM levels remained at similar levels of 5.3% (95% CI: 4.8-5.8), 4.3% (95% CI: 3.8-4.8) and 1.1% (95% CI: 0.8-1.3). However, significant deterioration was observed in the Western Area especially Urban, where GAM, MAM and SAM rates changed from 1.9% (95% CI: 1.2-3.1), 1.8% (95% CI: 1.1-3.0), and 0.1% (0.0-0.9) in 2014 to 5.8% (95% CI: 4.1-8.1), 4.9% (95% CI: 3.2-7.3) and 1.0% (95% CI: 0.5-2.1) in 2017 respectively. It is remarkable to note that the Western Area has since 2014 experienced multiple shocks with devastating effects including mudslide /landslide, floods and watery diarrhea besides Ebola outbreak.

**Table 51:** **WHO Classification of severity of malnutrition in a community**

| WHO Classification of severity of malnutrition in a community | | | |
|---|---|---|---|
| **Type of Malnutrition** | **Prevalence cut- off** | **Mean Z Scores** | **Severity of Malnutrition** |
| **Prevalence of Global Acute Malnutrition (WHZ<-2 and/or Oedema)** | < 5% | > -0.40 | Acceptable |
| | 5.0 – 9.9% | -0.40 – -0.69 | Poor |
| | 10.0 – 14.9% | -0.70 - -0.99 | Serious |
| | >=15% | < -1.00 | Critical |
| **Prevalence of Underweight (WAZ<-2)** | < 10% | - | Low (Acceptable) |
| | 10.0 – 19.9% | - | Medium (Poor) |
| | 20.0 – 29.9% | - | High (Serious) |
| | >=30% | - | Very high (Critical) |
| **Prevalence of Stunting (HAZ<-2)** | < 20% | - | Low (Acceptable) |
| | 20.0 – 29.9% | - | Medium (Poor) |
| | 30.0 – 39.9% | - | High (Serious) |
| | >=40% | - | Very high (Critical) |

Similarly, after adjusting for the two districts, the respective prevalence of national, moderate and severe underweight were 13.8% (95% CI: 13.0-14.8), 10.7% (95% CI: 10.0-11.5) and 3.1% (95%

CI: 2.7-3.6) and did not differ significantly from the 2014 rates of 12.9% (95% CI: 11.9-14.0), 9.8% (95% CI: 9.0-10.6) and 3.2% (95% CI: 2.7-3.7) when Bonthe and Kailahun were exclude.

Wasting, the main indicator of acute malnutrition occurs because of recent rapid weight loss, or a failure to gain weight within a relatively short period of time and according to the UNICEF framework of Malnutrition may be the result of inadequate food intake or recent episode of illness. Wasting occurs more commonly in children under five years old, often during the stage when complementary foods are being introduced and children are more susceptible to infectious diseases, explaining why acute malnutrition was higher among the younger (6-29 months) than the older children (30-59 months). The younger age group includes the critical breastfeeding age (6-23.9 months) during which the child experiences multiple challenges in terms of the quality and quantity of food consumed as well as frequent infections resulting from poor feeding practices and conditions. Recovery from wasting is relatively quick once optimal feeding, health, and care are restored. Wasting occurs because of deficiencies in both macronutrients (fat, carbohydrate and protein) and some micronutrients (vitamins and minerals). When combined with bilateral edema (presents as swelling in both feet), an essential indicator for determining the presence of Severe Acute Malnutrition or kwashiorkor, the Global Acute Malnutrition prevalence is a universal measure of the severity of malnutrition and health of a community. Oedema results from the excessive accumulation of extracellular fluid because of severe nutritional deficiencies, and is a serious cause for concern. All children identified with bilateral oedema were referred immediately for treatment at the nearest health facility for In-Patient Care. This was was done to the six (6) cases that were identified during the SLNNS 2017 since presence of bilateral oedema is classified as severe malnutrition.

The national prevalence of stunting (HAZ<-2) of **31.3%** (95% CI: 30.0-32.6); 21.3% (95% CI: 20.3-22.3) moderate and 10.0% (95% CI: 9.2-10.7) severe stunting indicates *high* or *serious* situation of chronic malnutrition according to WHO Classification (Table 51). There was a slight deterioration from the 2014 findings of **28.8%** (95% CI: 27.5-30.2), 21.0% (95% CI: 19.9-22.1), and 7.8% (95% CI: 7.2-8.5) for global, moderate and severe stunting respectively. It is important to note that, there was no significant difference even after adjusting for the two districts, as the national stunting, moderate stunting and severe stunting rates remained at similar levels of 31.1% (95% CI: 29.7-32.5), 20.9% (95% CI: 19.9-22.0) and 10.1% (95% CI: 9.4-11.0) respectively. Stunting is common in areas of low food security, and acute malnutrition is instigated by a combination of economic, agricultural production, lack of access to diversified diets and consumption of insufficient essential nutrients as well as health-related factors. The consequences of the stunting can be looked at in the short-term in terms of mortality from infections, in particular pneumonia, malaria and diarrhea; in medium term, cognitive, education and behavioral aspects of child development; and in long term, the risk of poor health and lower attainment of socio-economic productivity throughout lifetime and are irreversible.

The analysis of trends in prevalence of malnutrition have generally shown decrease (Figure 15) in acute and chronic (stunting) since 2008, however the 2017 findings indicate a plateau and no significant improvement from 2014 results, partly for the reasons aforementioned. The rates are however better than the previous 2008-2010 rates and the regional prevalence in Sub-Saharan Africa (SSA) and West and Central Africa (WCA) as shown in Figure 15. Caused by

The gender differential levels observed in the results with higher prevalence of malnutrition seen in boys compared to girls cannot be explained by this study and would require further study on

causal analysis and Knowledge, Attitude and Practices (KAP) analysis for any preferential treatment or exposure of the boy child at this critical age (6-59 months).

**Figure 15**: *Trends in levels of acute malnutrition (WHZ<-2 or oedema WHO 2006)*



Trends in levels of acute malnutrition (WHZ<-2 or oedema, WHO 2006) in Sierra Leone)

SSA – Sub Saharan Africa          WCA – Western and Central Africa
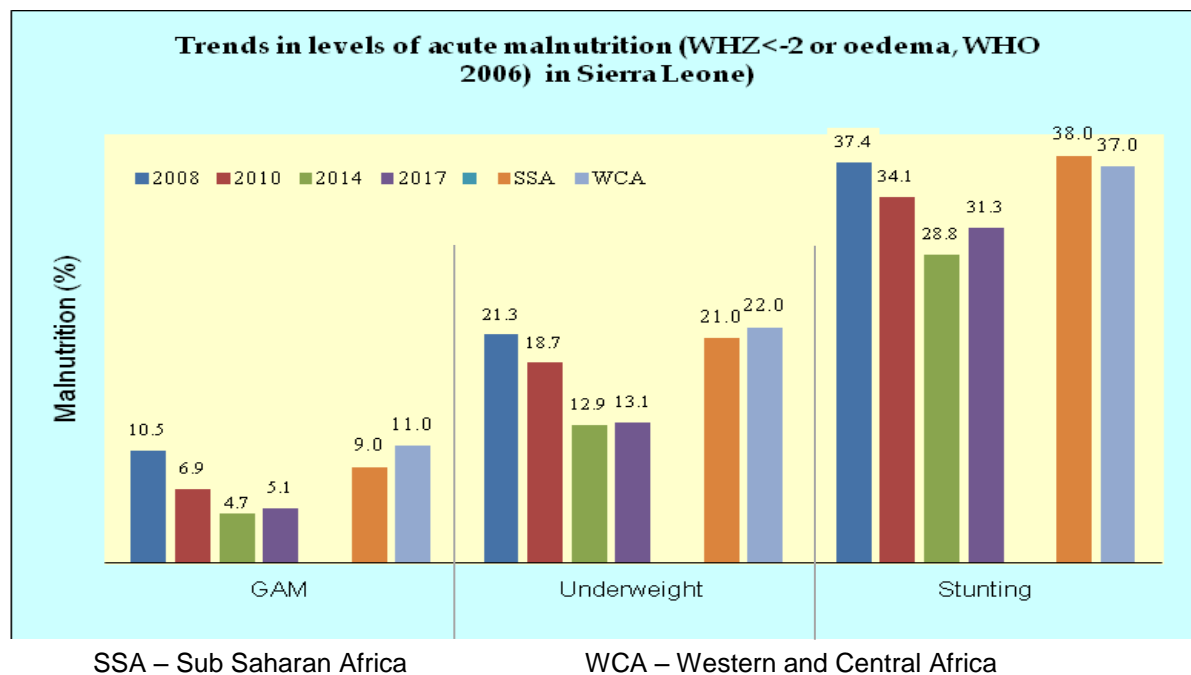
## 7.2    Death Rates

The retrospective crude and under five death rates of **0.19** (95% CI: 0.15-0.24) and **0.16** (95% CI; 0.10-0.27) are both below the SPHERE *alert* thresholds of 1/10,000/day and 2/10,000/day respectively. The findings indicate stable situation from the CDR of 0.36 deaths/10,000/day and U5DR of and 0.83 under five deaths/10,000/day reported in SLNNS 2014 and the 2010 rates of 0.83 (95% CI: 0.75-0.91) and 1.18 (95% CI: 1.03-1.35) for CDR and U5DR respectively. Most deaths by recall were caused by illnesses both in under fives (92.9%) and in total (81.9%) and occurred in their current locations (79.2%). Figure 16 shows that mortality rates have remained within the SPHERE *acceptable* thresholds since 2010.

**Figure 16**: *Trends in Mortality Rates (2010-2017) in Sierra Leone*
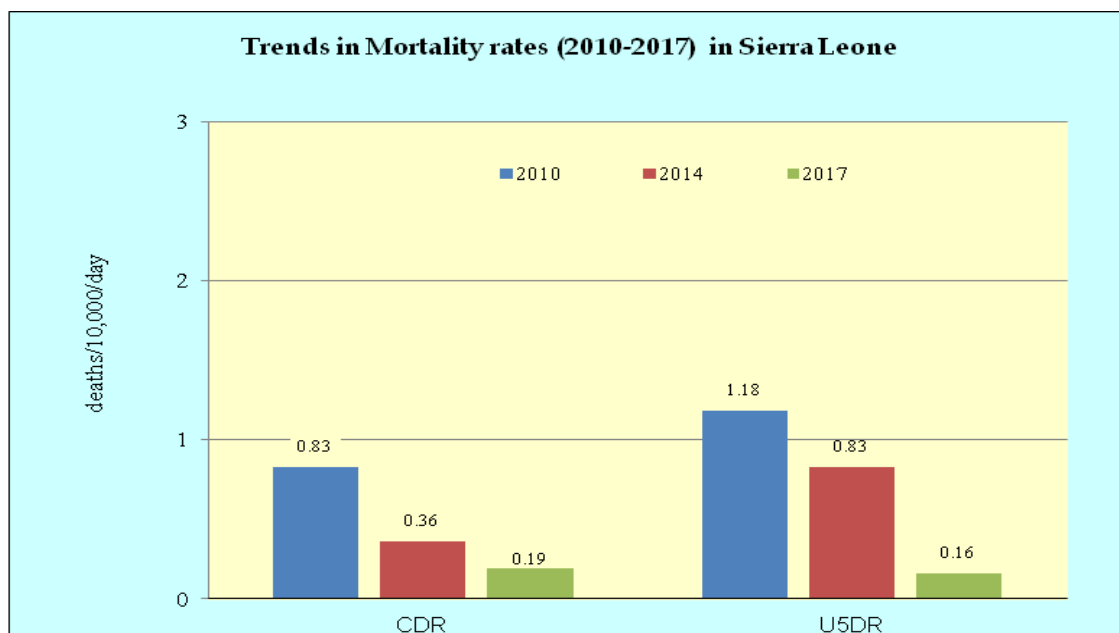


## 7.3    IYCF Practices

On a positive note, breastfeeding is a widespread practice among the population with nearly all the assessed children 0-23 months ever breastfed (99.1%), 88.2% still breastfeeding and 61.6% of 0-6 months breastfed exclusively. The rate of breastfeeding drops steadily with age with 94.5% of continued breastfeeding at 1 year. Breastfeeding guarantees food and fluid security in infants for the first six month and provides active immune protection. There is however, significant variations in rates of breastfeeding indicators and some districts especially Western Area Urban, Bonthe and Tonkolili would require more effort to promote optimum breastfeeding benefits.

Complementary foods are still introduced to a large number of children (40%) before the age of six months which is earlier than the WHO's recommendation that mother's exclusively breastfeed their children (give an infant no other liquids or foods apart from breast milk up until six months of age). Early introduction to complementary foods or failing to exclusively breastfeed a child exposes the child to unhygienic feeding conditions and increases their vulnerability to infection and other illnesses. This is especially a real risk in the congested slums and rural environments in some districts such as Bo, Kailahun, Kambia, and Port Loko where water is not treated and/or regular hand-washing with soap is not universally practiced making the children more vulnerable to diarrheal infections.

Sub-optimal feeding of infant and young child during illness is prevalent, with introduction of semi solid and solid foods in terms of diversity and frequency. More than 70% of the children do not

receive diversified diet with poor monotonous diets reported widely in all the districts but most particularly in Koinadugu, Port Loko, Bonthe and Pujehun. More than 50% of the children (6-24 months) assessed do not meet the recommended minimum meal frequency for their age and breast feeding status and very few (13.9%) are fed on vitamin A rich foods.

Poor breastfeeding and complementary feeding habits are known to expose children to morbidity, malnutrition and even death. The rates of acute and chronic malnutrition higher among the breastfeeding age are indicative of the effect of sub-optimal IYCF practices among the population.

## 7.4    Food Security

The assessment findings indicate that a significant proportion of population face food shortage, hunger and food insecurity based on poor food consumption and dietary diversity.  The main source of the staple food (rice) is market/shop purchases with the main source of income from sale of crops/farm produce yet the population is just coming out of the lean season (June-August) and less than half (48%) have reported cultivating their lands. Limited income compounded by increased food prices, these factors put a strain on the households, with more than half reportedly spending more than half of disposable income on food. Rice and wheat foods are however; readily available in the market stores from adequate imports and with the onset of the rains during the survey in September, there is increased availability of variety of foods including green corn harvest, fruits and vegetables.

Since 2014, many poor households in Sierra Leone have experienced new or increased food insecurity as Ebola-related fears and restrictions on movement and mass gatherings disrupted free trade, increased food prices and reduced household income. According to the Famine Early Warning Systems Network (FEWSNET) forecast general improvement in the food security situation to IPC Phase 1[9] until January 2018 due harvest prospects from the sufficient rainfall, combined with normal market and labor activities that would allow poor households to meet their food needs.

## 7.5    Possible factors associated with Malnutrition in Sierra Leone

In Sierra Leone, like many other developing countries in the region, and based on the UNICEF conceptual framework of malnutrition, morbidity and dietary intake are the immediate causes of malnutrition underlain by food insecurity, poor maternal and child care and poor/unhygienic environment. Morbidity and malnutrition have interchangeable cause-effect relationship and may both result in mortality of affected groups in population.

Frequent illnesses as reported in nearly one-quarter of the assessed children, from one or more communicable childhood diseases (e.g. fever, cough, diarrhea, skin infections, eye infections among others) in the two weeks prior to the assessment is a possible contributive factor to the poor nutrition situation. MOHS also enlists malaria and pneumonia as the common reported causes of morbidity in health facilities during the rainy season.  Morbidity levels are aggravated by the poor WASH conditions in many parts of the country characterized by poor access to safe drinking water, lack of sanitation facilities and poor hand-washing practices at critical times.

Inadequate food consumption directly results into nutrient intake deficits and a significant contributing factor to the poor nutrition situation. Many of the households who are food insecure may not consume sufficient food in terms of quantity and variety of nutrients for health and vitality. Although there is high consumption of starchy staple cereal and plantain, consumption of iron-rich

---

[9] *The Integrated Phase Classification (IPC) is a standardized tool that classifies the severity and magnitude of food in security from Minimal (IPC 1) to Famine (IPC 5).

animal source foods such as milk, meat and eggs is very poor by households across the districts, and so is the case for consumption of Vitamin A-rich (yellow or orange-fleshed) fruits/vegetables. There is however good fish and vegetable oil consumption. Most households have no lactating livestock, and milk mostly consumed in tea/coffee drinks is purchased as powder milk at high prices for many households. Qualitative analysis shows that households generally take two meals in a day (breakfast and lunch) and a typical meal in a locality is monotonous and less diversified in diet. Breakfast is prepared with boiled cassava or sometimes sweet potatoes and taken with drinking water, and lunch is prepared with boiled white rice and relish of soup or broth. Soup at times may be enriched with palm oil, beans or fish, and condiments of flavouring powder, onions, pepper (green or red). The broth may be prepared from green leafy vegetables, cassava or sweet potato leaves and enriched with fish or *kain kain*, which some households grow at their backyard/kitchen gardens. The minority households that take a third meal (supper) typically serve bread with tea (white or black) or cocoa with sugar; and sometimes enrich the meal with eggs or fried fish.

## 8.    CONCLUSIONS & RECOMMENDATIONS

### 8.1    Conclusions

In conclusion, the nutrition situation in the country is *poor*, with global acute malnutrition (GAM) rate of **5.1%** (95%CI: 4.6-5.6). The crude and under five mortality rates of **0.19** (95% CI: 0.15-0.24) and **0.16** (95% CI: 0.10-0.27) also remain below the SPHERE *alert* levels. Although the levels of both wasting and stunting has shown an improving trend in the previous two national surveys, the current findings have shown a worsening situation post-Ebola period with prevalence of stunting rates of **31.3%** (95% CI: 30.0-32.6), and remains high (>30%) indicating a persistent *serious* chronic malnutrition according to WHO Classification, this trend needs to be addressed comprehensively. These rates are equivalent to 47,861 wasted children and 293,736 stunted children in 2017 respectively.

The existence of both under and over nutrition in children and women indicates the emerging double burden and complexity of malnutrition in the country. The national prevalence of acute malnutrition using MUAC (<23 cm) was **5.7%** among the pregnant and/or lactating women and **5.1%** based on BMI of non pregnant/lactating women. On the extreme right hand of the distribution, the prevalence of overweight and obese was **18.4%** and **7.5%** respectively.

Even though the key underlying factors affecting the nutritional status of the children i.e. morbidity, food insecurity, poor child care, lack of safe drinking water and limited sanitation and hygiene facilities remain key risk factors, it is important to note that malnutrition is multifaceted and chronic malnutrition is hinged on the basal socio-economic, education and cultural structures. Reducing the prevalence of stunting from 25.7% to 11.7% by 2020 as per Nutrition for Growth (N4G), commitments that GoSL undertook in 2013 require continued concerted and integrated efforts among all the relevant sectors in the country. Similarly, achieving by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and addressing the nutritional needs of adolescent girls, pregnant and lactating women and older persons[10] as part of the 2030 Agenda for Sustainable Development require renewed commitments and comprehensive stunting reduction strategies.

### 8.2    Recommendations

The ***poor*** acute nutrition situation and ***serious*** chronic nutrition situation in the country is attributed to multiple and interrelated factors that call for continued integrated interventions. These efforts should address both immediate needs as well as develop long-term strategies to enhance access to public health services; support to sustain livelihood systems and social protection mechanisms. Specific recommendations include:

---

[10] Indicator 2.2 of Goal 2 of the Sustainable Development Goals (SDG). " By 2030, end all forms of malnutrition…."

**Immediate Interventions**

- Evaluate the need to maintain scale up of IMAM programme for rehabilitation of acutely malnourished children through sustained active case finding, continued self-referrals and capacity building of the existing CHP, CHC and MCHP staff and the community to manage acutely malnourished children.

- Since the surveys has shown that nutrition admissions screening using MUAC is less sensitive and leaves out a significant proportion of deserving malnourished cases, the GoSL/MoHS should review the guidelines to use weight-for-height Z scores for admissions and encourage its implementation at the community/health facility levels.

- Since the establishment of the national IMAM program and supportive treatment programs and associated WASH, food security and livelihood interventions by DFNS, line ministries and national NGOs with support from international UN and NGO partners, the MoHS covered many facilities and districts which did not have nutrition (SC,OTP, STP) services. It is important to maintain these services and to scale-up to more places that still do not have these nutrition services.

- Protect the significant gains made over the years by strengthening the interagency and interdepartmental emergency response teams amidst the risks of shocks such as Ebola and cholera outbreaks, land/mud slides, flooding and droughts arising from climatic changes.

- Cognizant to intensified health and nutrition education and interventions for improving social security, water, sanitation and hygiene (WASH) practices alongside nutrition programmes by the government and different UN & NGO programmes, these programmes need to be strengthened through integrated planning and implementation. Health, FSL and WASH based interventions should complement national nutrition programs in order to address the underlying causes of malnutrition

- Conduct an integrated Nutrition Causal Analysis (NCA) Study for malnutrition such as LinkNCA to identify the predominant causes of stunting in a few satellite districts and prioritize key areas of intervention. The study should include a qualitative enquiry to understand why boys tend to be more malnourished in the country as shown in this survey.

- Conduct a Cost of Hunger (COHA) study for Sierra Leone to quantify the economic impact of malnutrition on the country's development for high-level advocacy to the government and financial institutions/partners to invest more on nutrition.

- Coverage (SQUEAC or SLEAC) survey to evaluate coverage in districts with ongoing health and nutrition interventions by the government and different agencies since SMART survey is just indicative as it only determines the immunization status of the entire population.

- Intensify health and nutrition education activities on good IYCF practices targeting caregivers with focus on promoting exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvements in household hygiene including health seeking behaviors and practices, through women support groups within the communities who are advocating for optimal IYCF. Continued health education to sensitize the community on domestic treatment of drinking water and proper disposal of human faecal waste to avoid contamination of water sources is encouraged.

**Long term Interventions**

- Put stunting prevention into the forefront of the national nutrition agenda targeting the critical first 1000 days of life to produce greater impacts on health and education in the medium-term and on economic productivity and inclusive growth in the longer term. Support food and agriculture based interventions in complement to national nutrition programmes that focus on

evidence based (Bhutta, et al. 2015) preventive and treatment layers in the management of acute and chronic malnutrition. Focus should be given to the improvement of nutrition sensitive community and household food production systems that produce diverse nutrient-rich cereal foods, fruits and vegetable.

- Review policies relating to nutrition and food security based on the new evidence presented by the SMART survey, more specifically, the survey data should be used in the process of reviewing the National Food and Nutrition Security Implementation Plan to pave the way for integrated multisectoral and multistakeholder coordination to address undernutrition in Sierra Leone. Improve the policy environment to promote and deliver IYCF practices and services by ensuring the availability of legislation on the Regulation on Marketing of the breast milk substitutes.

- Increase supply of and access to more nutritious/diverse foods through social and behaviour change communication on consumption of fruits, vegetables and pulses, through home production and/or market purchase. This need to be complemented by recipes preparation and promotion to improve the diversification of the meals.

- Support milk production and consumption in collaboration with relevant institutions, ministries and departments to improve dietary diversity from animal source foods.

- Strengthen the national nutrition surveillance system in integration with HMIS to better monitor the nutrition trends and implementation of both nutrition sensitive and nutrition specific programmes. Given the recurrent food deficit during hunger gap periods, encourage partners to support periodic annual SMART surveys in specific districts of intervention especially during the lean seasons to provide timely data for monitoring and any early warning signs. Continue the 3-year periodic national nutrition SMART surveys to provide with data on nutrition situation and assess the progress towards global, regional and national commitments to eliminate hunger in the country.

- The communities be trained on sanitation and maintenance of the water systems in order to address the issues of limited access to safe water. Provision of sanitary facilities including building of latrines at household level in settled populations or at strategic locations in the bomas/villages for appropriate disposal of human excretal waste. This should be coupled with awareness on the need to use such facilities.

- Initiate and maintain programmes for treatment and prevention of the emerging overweight and obesity in adults such as behaviour change communication (BCC) for adoption and maintenance of lifestyle behaviors contributing to both dietary intake and physical activity.

## 9.     ANNEXES

### Annex A:          Household Survey Tool

**FOOD SECURITY AND LIVELIHOOD QUESTIONNAIRE**
*(continue questionning HH's where we've collected Anthro' & Health information)*

Date (DD/MM/YY): …..../….…./………..   Cluster No:………....…   Team No………...…   Region …….....………….…………….......   District:……………………………...……….……..
Village:……....……………………………………....……

| HH NO* | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 4.8 | 4.9 | 4.10.1 | 4.10.2 | 4.11.1 | 4.11.2 | 4.12.1 | 4.12.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HH NO* | HH size (No. of people living in HH) | Is the HH head male or female? 1 = Male 2 = Female | What is your staple food in the last 30 days? 1=Sorghum 2=Plantain 3=Sphagetti/pasta 4=Rice 5=Maize 6=Millet 7=Beans 8=Peas 9=Cassava 10=Sweet potatoes 99=Other, specify | What was the main source of your staple food in the past 7 days? 1 =Own production 2 =Market/shop purchase 3= Food Assistance/ Relief 4 =Labour exchange/ Work for food 5 =Borrowing/debts 6 =Remittance 7= Fishing 99= Other, specify | What was the main source of your staple food in the past 3 months? 1 =Own production 2 =Market/shop purchase 3= Food Assistance/ Relief 4 =Labour exchange/ Work for food 5 =Borrowing/debts 6 =Remittance 7= Fishing 99= Other, specify | What was your HHs main of income activity (source) in the last 30 days? 1 = Sale of crops 2 = Sale of livestock 3 = Sale of animal product 4= Sale of alcoholic brews 5 = Sale of fish 6 = Sale of food aid 7 = Casual Labour 8 =Skilled labour 9 = Salaried work 10 = Sale of natural resources (firewood; charcoal; grass) 11 = Petty trading 12 = Family support    13= Remitance 99=Others, (Specify) | Did you cultivate in the recent season? 0 = No 1 = Yes | Does the HH own any livestock, herds or farm animals ? ------ 0 = No 1 = Yes | Out of your expenditure in the past 30 days, how much was allocated to food purchases? (Use Proportional Piling) 0 = 0% 1 = 1-50% 2 = 51-65% 3= >65% | In the past [4 weeks/30 days], was there ever no food to eat of any kind in your house because of lack of resources to get food?--------- 0 = No (Skip to Q.4.11) 1 = Yes | If Yes, How often did this happen in the past [4 weeks/30 days]?---- 1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times | In the past [4 weeks/30 days], did you or any household member go to sleep at night hungry because there was not enough food?------- **0** = No (Skip to Q4.12) 1 = Yes | If Yes, How often did this happen in the past [4 weeks/30 days]?------------ 1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times) | In the past [4 weeks/30 days], did you or any household member go a whole day and night without eating anything at all because there was not enough food?-------- 0 = No (Skip to Q.5) 1 = Yes | If Yes, How often did this happen in the past [4 weeks/ 30 days]?.. 1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| | 5.1 | 5.2 | 5.3 | 5.4 | | 5.5 | 5.6 | | 5.7 | 5.8 | 5.9 | 5.10 | 5.11 | 5.12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | HHDD | | Over the last 7 days, how many days did your household consume the following foods? | | | | | | | | |

| HH NO | Yesterday, how many meals were eaten by? | | | What did your household eat yesterday, day and night? *(tick the food groups for all foods mentioned)* 1=Cereals; 2=Milk & milk products; 3=Meat and offals; 4=Vegetables dark green; 5=Other vegetables 6=Yellow or orange fleshed fruits 7=Other fruits; 8=Pulses;9=Orange fleshed tubers/roots; 10=White tubers & root crops; 11=Eggs; 12=Fata/Oils 13=Sugar/honey; 14=Fish and sea foods; 15=Condiments/spices | Cereals & tubers (maize, rice, millet, sorghum, cassava, sweet potatoes, bread etc)? | Pulses (beans, lentils, cashew nuts, peas, groundnuts, green grams, etc)? | Vegetables? (e.g. okra, potato/cassava leaves - *crain crain*, e.t.c) | Fruits? (mango, orange, banana e.t.c) | Animal protein foods (meat, poultry, fish, eggs)? | Milk & dairy products? (e.g. milk, yoghurt, etc) | Sugar, sweets and honey (e.g. sweetened foods, drinks, chocolates, sweets, candies, etc)? | Oils/fats? *(e.g. palm oil, fat, butter, margarine added to food or used for cooking)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | family? | you (woman)? | U5s? | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

<br>

| | 6.1 | 6.2 | 6.3 | 7.1 | 7.2 | 7.3 | 7.4 | 7.5 | 7.6 | 7.7 | 7.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Has your household done any of the listed things, and **how frequent** were they done **in the past 7 days** (If not used, mark 0): | | | | | | |
| HH NO | Has your household experienced any abnormal events/circumstances or challenges (shocks) that have made it difficult to obtain sufficient means of livelihood in the last 12 months? **0**=No **1**=Yes *(if No, skip to Qn 7)* | If Yes, What are the main shocks faced by the household in the past **one year**? 1=Insecurity;  2=High costs of food (expensive) 3=Floods;  4=Mudslide/ landslide 5=Human sickness; 6=Livestock diseases 7=Pests or Crop diseases; 8=Limited access/mobilty 9=Delay of rains; 10=Lack/scarcity of water 11=Bereavement; 12=Crop failure *(Tick MAX 3 main shocks, but you can also tick less. DO NOT READ OUT THE OPTIONS)* | When (season) in the last one year did you experience these shocks/events? 1=Rainy season 2=Dry season | In the past 7 days were there **times when** your household **did not have enough food or money to buy food**? **0**= No; **1**=yes *(If the answer is "No" skip to Qn 8)* | **a.** Rely on less preferred and less expensive foods? | **b.** Borrow food, or rely on help from a friend or relative? | **c.** Limit portion sizes at meal times? | **d.** Restrict consumption by adults so that small children can eat? | **e.** Reduce the number of meals eaten in a day? | **f.** Sell more animals than usual? | **g.** Consume seed stocks |
| | | | | | | | | | | | |

## Annex B:          Child & Maternal Data Tools

Date (DD/MM/YY): …../……/………   Cluster No:………   Team No……   Region …….…………   District:……………….   Chiefdom: …….……………   Village:…….....……….………………...…….

| 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Child No. (ID) | HH NO | Child Name | Sex  m = Male  f = Female | Date of Birth (DD/MMYY) *If no record, go to 1.7 (and use Events Calendar)* | Age in months | Weght in Kg (to 1dp e.g. 12.4) | Height in cm (to 1dp e.g. 78.1) | Oedema  n = No  y =Yes | MUAC in cm (to 1dp e.g. 11.3) | Has [name] received Vit. A in last 6 months (show capsule)?   0 = No  1 =Yes | Has [name] received Measles Vaccine in last 6 months?  0 = No  1 =Yes with EPI card  2 =Yes recall  3 = Child <9m | Has [name] had any Illness in past 14 days?  0 = No  1 =Yes   If no, go to 2.5 | If yes, Type of Illness  1 = Fever  2 = Cough  3 = Diarrhoea   99 = Other (specify) | If fell ill, what treatment was sought:  0 = None  1 =Hospital  2 = Mobile /outreach clinic  3=Community Health Facility (CHP/CHC, MCHP)  4=Private clinic  5=Traditional practitioner  6=Pharmacy/chemist  99=Other (Specify) | Did [name] sleep under a mosquito net (LLITN) last night?  0= No  1= Yes | Has [name] been Dewormed in last 6 months (12-59 months)?  0= No  1= Yes  99 =Don't Know |
| 1 | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | |

## IYCF Questionnaire

*To be conducted in every selected household with children 0-23.9 months. Some questions have special filters based on the age band of the child.*

Date (DD/MM/YY): …../…..../………  Cluster No:………  Team No……  Region …....…......  District:……………….  Chiefdom: ……………..  Village:……………..…....

Now I would like to ask you [mother/caregiver of child] more about your [child name]

| Identification | | | | | IYCF (0 to 23 MONTHS) | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3.1 | 3.2 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7 | 3.8 | 3.9 | 3.10 | 3.11 |
| Child No. (ID) | HH No. | Child Name | Sex M= Male F= Female | Age in months (0-23 months) | *[0-23 months]* Has [NAME] ever been breastfed? 0 = No 1= Yes (If No, skip to 3.10) | How long after birth did you first put [NAME] to the breast? 1 = Less than one hour 2 = Between 0 and 24 hours (within the 1st day) 3 =More than 24 hours (2nd day or after) 9 = Don't know | Was [Name] breastfed yesterday (during day or night)? 0 = No 1= Yes | Was [Name] bottle-fed yesterday during day or night)? | *[6-23 months]* At what age (in months) was [Name] given any food/water other than breastmilk (exclude medicine)? (If child is <6 months, skip to 3.12) | *[6-23 months]* Yesterday during the day and night, how many times did [Name] eat solid or semi-solid foods other than breastmilk or liquids? |
| | | | | | | | | | | |
| | | | | | | | | | | |

| IYCF Questionnaire | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *To be conducted in every selected household with children 0-23.9 months. Some questions have special filters based on the age band of the child.* | | | | | | | | | | |
| Date (DD/MM/YY): …../……./………   Cluster No:………   Team No……   Region …….…………   District:………………   Chiefdom: ……………… Village:……………..…... | | | | | | | | | | |
| Now I would like to ask you [mother/caregiver of child] more about your [child name] | | | | | | | | | | |
| Identification | | | | | IYCF (0 to 23 MONTHS) | | | | | |
| 3.1 | 3.2 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7 | 3.8 | 3.9 | 3.10 | 3.11 |
| Child No. (ID) | HH No. | Child Name | Sex M= Male F= Female | Age in months (0-23 months) | *[0-23 months]* Has [NAME] ever been breastfed? 0 = No 1= Yes (If No, skip to 3.10) | How long after birth did you first put [NAME] to the breast? 1 = Less than one hour 2 = Between 0 and 24 hours (within the 1st day) 3 =More than 24 hours (2nd day or after) 9 = Don't know | Was [Name] breastfed yesterday (during day or night)? 0 = No 1= Yes | Was [Name] bottle-fed yesterday during day or night)? | [6-23 months] At what age (in months) was [Name] given any food/water other than breastmilk (exclude medicine)? (If child is <6 months, skip to 3.12) | *[6-23 months]* Yesterday during the day and night, how many times did [Name] eat solid or semi-solid foods other than breastmilk or liquids? |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| | 3.11.1 | 3.11.2 | 3.11.3 | 3.11.4 | 3.11.5 | 3.11.6 | 3.12 | 3.13.1 | 3.13.2 | 3.13.3 | 3.13.4 | 3.13.5 | 3.13.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3.11 [If child is 6-23 months] Yesterday, during the day or at night, did [NAME] eat foods from any of the following food groups? | | | | | | 3.12 | 3.13 [If child is 0-5 months] Yesterday, during the day or at night, did [NAME] receive any of the following liquids? | | | | | |
| Child No. (ID) | Cereals, roots and tubers (e.g. rice, potatoes, cassava, pasta, plantain, maize, etc)? 0 = No 1= Yes 9 = Don't know | Legumes, pulses and nuts (such as beans, peas, groundnuts, etc)? 0 = No 1= Yes 9 = Don't know | Dairy products (such as milk, yoghurt, cheese, etc, excluding breastmilk)? 0 = No 1= Yes 9 = Don't know | Meat, poultry and fish (e.g. chicken, eggs, fish, and other meats)? 0 = No 1= Yes 9 = Don't know | Vitamin A-rich fruits and vegetables (e.g. carrots, pumpkin, mangoes, pawpaw, etc)? 0 = No 1= Yes 9 = Don't know | Other fruits and vegetables? 0 = No 1= Yes 9 = Don't know | *[If child is 0-5 months]* Was [Name] fed on colostrum at birth (yellow liquid milk from the first breastmilk) [local name]? 0 = No 1= Yes | Plain water 0 = No 1= Yes 9= Don't know | Infant formula such as Lactogen, Peak milk or Nido)? No of times? *(Put 0 for no/none)* | Milk such as tinned, powdered, or fresh animal milk (No of times)? (Put 0 for no/none) | Juice or juice drinks (e.g. rice water, coconut water, palm wine/*poyo* or other fruit drinks)? 0 = No 1= Yes 9 = Don't know | Any other liquids such as sugar water, ORS, porridge or soup/broth 0 = No 1= Yes 9 = Don't know | Any solid or mashed food? 0 = No 1= Yes 9 = Don't know |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Maternal Nutrition Questionnaire**

| 10.1 | 10.2 | 10.3 | 10.4 | 10.5 | 10.6 | 10.7 | 10.8 |
|------|------|------|------|------|------|------|------|
| Woman No | HHNO | Name of Woman *(List all women of reprodctive age i.e. 15-49 Years)* | Age (Years) | Physiological Status 1=Pregnant/ Lactating 0=Not pregnant/lactating | Weght in Kg (to 1dp e.g. 62.4) | Height in cm (to 1dp e.g. 167.1) | MUAC      in cm (to 1 dp e.g. 24.3) |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

**MDD-W Questionnaire**

| | | Yesterday, during the day or at night, did you (woman) eat foods from any of the following food groups? [0=No 1=Yes] | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 11.1 | 11.2 | 11.3 | 11.4 | 11.5 | 11.6 | 11.7 | 11.8 | 11.9 | 11.10 | 11.11 | 11.12 | 11.13 | 11.4 | 11.5 | 11.16 |
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | U | V |
| Woman No. | HHNO. | Foods from grains (e.g. Porridge, bread, rice, pasta/noodles, maize, millet, sorghum or other foods made from grains) | White roots/tubers and plantains (e.g. White potatoes, white yams, cassava, arrow roots or any other foods made from white-fleshed roots or tubers, or plantains | Pulses (beans, soybean, peas, lentils, green grams, etc) | Nuts & seeds (groundnut, peanut, cashewnut, sesame, etc) | Milk & milk products (milk, yoghurt, cheese, etc) | Organ meat (liver, kidney, heart, gizzard, etc) | Meat & Poutry (beef, goat, pork, chicken, game meat, etc) | Fish & Sea foods (e.g. baracuda, lobster, crayfish and crabs etc) | Eggs | Dark green leafy vegetables (e.g. cassava leaves, pumpkin leaves, potato leaves, amaranth, kales, spinach, etc) | Vitamin A-rich vegetables, roots & tubers (yellow or orange coloured - e.g pumpkin, carrots, sweet potatoes, squash, red pepper, etc) | L=Vitamin A-rich (yellow or orange fleshed) fruits (e.g. papaya, mango, red palm, passion fruit, apricot, etc) | Other vegetables (e.g cucumber, tomatoes, onions, cauliflower, cabbages, green peas mushroom, etc) | Other fruits (e.g. sweet bananas, apple, avocado, black berry, pineaple, orange, | Condiments & seasonings (chillies, spices,herbs, tomato sauce/paste, flavour cubes) | Other beverages (unsweetened tea/coffee, pickles, clear broth, alcohol, etc). |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

## DEMOGRAPHY & MORTALITY QUESTIONNAIRE
(To be conducted in EVERY SELECTED HH in the Cluster)

| Region …….…………………..… District:……………………….. Chiefdom: …………………...… Village: …………...………. GPS: ……… ………… |
| Date (DD/MM/YY): …....../…...../……..……. Cluster No: ………....… Team No: ……… |

Administer the questions in the following order, filling out the details as required
a) List all the persons that slept in this household last night.
b) List all the people that slept in this household on the first night of the recall period (FILL IN DATE/EVENT) but did NOT sleep in the household last night.
c) List all the people that slept in this household on the first night of the recall period but have since died.

| 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 | 9.10 | 9.11 | 9.12 |
|---|---|---|---|---|---|---|---|---|---|---|
| HHNO | PNO | Name of person | Sex<br><br>m = Male<br>f = Female | Age in completed years<br><br>(e.g. child of 10 months write age as "0", and if 59 months, age is "4") | Joined on or after [Recall Date]?<br><br>y=yes<br><br>(if not, skip to next Qn) | Left on or after [Recall Date]?<br><br>y=yes<br><br>(if not, skip to next Qn | Born on or after [Recall Date]?<br><br>y=yes<br><br>(if not, skip to next Qn | Died on or after [Recall Date]?<br><br>y=yes<br><br>(if not, skip to next Qn | If yes in Qn 9.9) What was the cause of death?<br><br>1=Uknown<br>2=Injuries<br>3=Sickness/illness | If yes in Qn 9.9) What was the location of death?<br><br>1=Current location<br>2=During migration<br>3=In the place of last residence |
| 1 | 1 | | | | | | | | | |
| | 2 | | | | | | | | | |
| | 3 | | | | | | | | | |
| | 4 | | | | | | | | | |
| | | | | | | | | | | |

### Annex D:          Sample of Local Events Calendar

| Month | Events per month and per year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Season | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | |
| January | | | | NY (1st ) | 56 | NY (1st ) 6th Rebels | 44 | NY (1st) | 32 | NY (1st ) | 20 | NY (1st ) | 8 |
| February | Dry | | | Valentine | 55 | 14th | 43 | 14th | 31 | | 19 | | 7 |
| March | | | | | 54 | | 42 | | 30 | Easter | 18 | | 6 |
| April | | | | Independence Day | 53 | Independence Day | 41 | Independence Day | 29 | Independence Day | 17 | Independence Day (27th) Easter | 5 |
| May | | | | Bob Marley's Night (11th) | 52 | Ebola Outbreak 23rd ) | 40 | Bob Marley's Night (11th) | 28 | Bob Marley's Night (11th) | 16 | Bob Marley's Night (11th) | 4 |
| June | | | | African Child (16th) | 51 | African Child (16th) | 39 | African Child (16th) | 27 | African Child (16th) | 15 | African Child (16th) Eidul Fitr (25th) | 3 |
| July | Rainy | | | | 50 | | 38 | | 26 | | 14 | | 2 |
| August | | | | BF Week (1-7th) | 49 | BF Week (1-7th) | 37 | BF Week (1-7th) | 25 | BF Week (1-7th) | 13 | BF Week (1-7th) FT landslide (14th) | 1 |
| September | | | | | 48 | | 36 | | 24 | 1st Flooding in Freetown (16th) | 12 | | 0 |
| October | | | 59 | | 47 | | 35 | | 23 | | 11 | | |
| November | Dry | | 58 | MCHWeek | 46 | MCH Week | 34 | MCH Week | 22 | | 10 | | |
| December | | Xmas; Boxing | 57 | | 45 | | 33 | | 21 | | | 9 | |

## Annex E:     List of Survey Team Members

| National Nutrition Survey 2017 Coordination Team | | | |
|---|---|---|---|
| **Names** | **Sex** | **Designation** | **Email Addresses** |
| Tom J. Oguta | M | Coordinator | tom.oguta@gmail.com |
| Mutiva Kappia | F | Coordinator | mrskappia@gmail.com |
| Wango Rose Lahai | F | Coordinator | wangolahai@yahoo.com |
| Mumin Kallon | M | Coordinator | deputynutco@sl.missions-acf.org |
| Zainab Mansaray | F | Coordinator | zainab.mansary@wfp.org |

| Survey Team Members and Roles/Responsibilities | | | | |
|---|---|---|---|---|
| | **Name** | **Sex** | **Role/Responsibility** | **Telephone Number** |
| **Team 1** | James Ponga Moriba | F | Supervisor | 076810410 |
| | Prince J.S.Walters | M | Team Leader | 076143831 |
| | James Abduali Koroma | M | Measurer | 076684132/077677919 |
| | Hannah Sessie | F | Assistant Measurer | 079653689 |
| **Team 2** | Motiva Kappiah | F | Supervisor | 076791969 |
| | Hammed B. karbo | M | Team Leader | 076671066 |
| | Juliette M. Mansaray | F | Measurer | 076846222 |
| | Alimamy R. Wurrie | M | Assistant Measurer | 076604327 |
| **Team 3** | Kadie Y. Kandeh | F | Supervisor | 078818695 |
| | Muctarr Sherif | M | Team Leader | 078336324 |
| | Harold Stevens | M | Measurer | 078360456 |
| | Maimunata K.Massaquoi | F | Assistant Measurer | 79688644/088127371 |
| **Team 4** | Mary Kandiatu Koroma | F | Supervisor | 76856556 |
| | Paul S. Mansaray | M | Team Leader | 78652609 |
| | Marcus B. koroma | M | Measurer | 79268678 |
| | Zainab M. Kamara | F | Assistant Measurer | 8466801 |
| **Team 5** | Foday Abdulai Sesay | M | Supervisor | 78750777 |
| | Collins G. Vandy | M | Team Leader | 78510745 |
| | Emmanuel M. Tucker | M | Measurer | 078264218/077288761 |
| | Bintu Jabbie | F | Assistant Measurer | 076828566/077836998 |
| **Team 6** | Mariama M.S. Margai | F | Supervisor | 78499945 |
| | Max James Yanguba | M | Team Leader | 78258912 |
| | Mohamed Sannoh | M | Measurer | 079444848/088385466 |
| | John Boima | M | Assistant Measurer | 78963831 |
| **Team 7** | Wango Rose Lahai | F | Supervisor | 076679043 |
| | Alfred S. Walters | M | Team Leader | 076588822 |
| | Francis Boima | M | Measurer | 076221594/077791949 |
| | Fodie U.K. Dabor | M | Assistant Measurer | 076221594 |
| **Team 8** | Janeba S. Kamara | F | Supervisor | 076720716 |
| | David Suale | M | Team Leader | 076574642 |
| | Benjamin Tommy | M | Measurer | 030317650 |
| | Michael Thomas | M | Assistant Measurer | 076387401 |
| **Team 9** | Bernadette Allieu | F | Supervisor | 078331847 |
| | Fredrick I. Ngebeh | M | Team Leader | 079953232 |
| | Francis Massalaly | M | Measurer | 077565785 |
| | Ramatulai Isata Bah | F | Assistant Measurer | 079741124 |

| Team 10 | Mohamed Ahbibu Kamara | M | Supervisor | 076344375 |
|---|---|---|---|---|
| | Mohamed I. Kamara | M | Team Leader | 076337018/077292365 |
| | Ishmael. F. Kamara | M | Measurer | 076188518 |
| | Peter Andrew Momodu | M | Assistant Measurer | 079801380 |
| Team 11 | Ansuman Sandy | M | Supervisor | 078281883/ 077818883 |
| | Osman momoh Kamara | M | Team Leader | 078871980 |
| | Yeanoh Hannah Samura | F | Measurer | 078912779 |
| | Samuel S. Brima | M | Assistant Measurer | 078437024 |
| Team 12 | Sulaiman Massaquoi | M | Supervisor | 078479131 |
| | Julian Suale | M | Team Leader | 079011064 |
| | Agnes Veronica Tucker | F | Measurer | 088972836 |
| | Harrieta Fatu Alpha | F | Assistant Measurer | 076194664 |
| Team 13 | James S. Ngebeh | M | Supervisor | 076137591/030397387 |
| | Boima S. Koroma | M | Team Leader | 076735652 |
| | Kasia P.B. Massaquoi | F | Measurer | 079991399 |
| | Ishmeal A.F.Kamara | M | Assistant Measurer | 078366050 |
| Team 14 | Kadiatu Y. Fofanah | F | Supervisor | 076713248 |
| | Sia Kema Serah Kaku | F | Team Leader | 076677086 |
| | Sorrie Samura | M | Measurer | 078917299 |
| | Alfred C. bangura | M | Assistant Measurer | 078039773 |
| Team 15 | Alhaji S. Hemoh | M | Supervisor | 078244441 |
| | Alhaji Salaam Fofanah | M | Team Leader | 076677024/077594324 |
| | Francis Tommy | M | Measurer | 079466126 |
| | Nabieu M. Konneh | M | Assistant Measurer | 079058081/077407924 |
| Team 16 | Nancy S. Njavombo | F | Supervisor | 076617833 |
| | Minkailu M.M. Massaquoi | M | Team Leader | 079100384 |
| | Peter Sorie Kamara | M | Measurer | 088365783 |
| | Abdulrahim Sherif | M | Assistant Measurer | 079634942 |
| Team 17 | Mawonday Marrah | M | Supervisor | 076719610 |
| | Leelei Cecilia Taluva | F | Team Leader | 076182024 |
| | Sheikh Alhaji Kamara | M | Measurer | 078659165 |
| | Aminata Winifred Bah | F | Assistant Measurer | 076932711 |

| # | Names | Replacements | Designation |
|---|---|---|---|
| | LIST OF /NUTRITIONISTS/SUPERVISORS REPLACED BY DFN FOR WESTERN URBAN FOR THE 2017 NNS | | |
| 1 | Mariam Margai | Feimata Russel | Supervisor |
| 2 | Mary Koroma | Joycelyn Sialeh | Supervisor |
| 3 | Foday A. Sesay | Isata Konteh | Supervisor |
| 4 | Kadie Y. Kandie | Maraima Lahai | Supervisor |
| 5 | Jeneba S. Kamara | Sia Manyeh | Supervisor |
| 6 | Kadiatu Y. Fofana | Mania Lahai | Supervisor |
| 7 | James Moriba | Paul Lahai | Supervisor |

**1. Enumerators** *(Usually person/staff involved in nutrition, food security and health):*

- Ensure that only the legible children and women are surveyed (6-59 months for anthropometry, 0-23 months for IYCF, and 15-49 years for women of reproductive age)
- Administer mortality, anthropometry & health, IYCF, and Women nutrition questionnaires
- Make accurate anthropometric measurements (including age, weight, height/length, oedema and MUAC)
- Record the data and answers/responses in the tablet in specified forms/questionnaires
- Ensure that all questions have been asked and answers recorded correctly before leaving each household
- Carry and take good care of the anthropometric equipment and tools (including tablets) to each household
- Submit the answered/completed questionnaires/forms under them to the supervisor in good order.
- Report any problems/difficulties to the supervisor for direction/advise

**2. Team Leaders** *(Usually experienced Agency or Ministry Staff)*

- If called upon, lead the team to consequent households selected for interview
- Help introduce the team to each new household and obtain the necessary consent
- Assist the enumerators note the correct household number to be recorded in the household questionnaire and mortality questionnaire for each visit.
- Ensure that the household questionnaires (HDD, Shocks & CSI, and WASH) is administered and all questions answered and entered into the tablet before leaving each household and cluster
- Help identify, verify and record oedema, measles and death cases
- Ensure the safety of survey equipment and tools (especially the tablets) under their care/use
- Ensure that good quality and reliable data is collected by their teams

**3. Supervisors** *(Usually experienced Agency or Ministry Staff)*

- Help the team in demarcating/identifying their cluster boundaries
- Explain to the village/ location leaders the purpose of the survey and the methods to be used – that children will be weighed, measured and caregivers interviewed, etc.
- Facilitate the second stage of sampling households at each selected cluster/village – segmentation, and listing and selection of the households to be visited/ interviewed
- Ensure their teams have all the necessary resources for each day. Ensure availability of survey equipment and tools (including the tablets) to their teams and their return after the survey

- Ensure that at least the predetermined number of households were surveyed, and all questionnaires completed in each cluster.

- Check and ensure that all anthropometric measurements were taken and entered correctly. Submit/send the finalized forms when and as required

- Ensure that both household, mortality, child and women data/questionnaires are correctly and completely answered/recorded before leaving each cluster

- Help verify, and record oedema, measles and death cases

- Help the team in probing and obtaining accurate answers on sensitive matters like income, personal hygiene, etc

- Ensure that good quality and reliable data is collected by their teams

- Arrange for movement and transport of their teams during the survey

- Identify and direct the team on cases that require follow up or revisits

- Provides a daily summary and update of progress to the coordinators on the Cluster Control Form

**4. Community Guides** *(should be a respected community member who knows the village)*

- Guide the survey team to the centre and edge of their clusters/ villages

- Welcome and introduce the survey team to the population and households in their clusters (village areas)

- Accompany the team and guide them through the right paths to the households visited

## **Annex G:          Referral Form**

Child Name: _____

Mother Name: _____

Age: _____

Sex:     Female ☐               Male ☐

Height: _____ cm

Weight: _____ kg

MUAC: _____ cm

Edema: ☐ Yes     ☐ No

Village/Locality: _____   District: _____

Referral Center: _____   Opening Days: _____

Admission Criteria: _____   _____

Supervisor:          _____ Sign _____

---

**Referral Form**

*This slip must be cut and filled by the teams when a child should be referred to a feeding/ health center for acute malnutrition or any other health problem observed.*

Child Name: _____

Mother Name: _____

Age: _____

Sex:     Female ☐               Male ☐

Height: _____ cm

Weight: _____ kg

MUAC: _____ cm

Edema: ☐ Yes     ☐ No

Village/Locality: _____   District: _____

Referral Center: _____   Opening Days: _____

Admission Criteria: _____   _____

Supervisor:          _____ Sign _____

**Annex H:          List of Selected EAs/Clusters**

| NO | | EACODE | PROVINCE | DISTRICT | CHIEFDOM | SECTION |
|---|---|---|---|---|---|---|
| 1 | | 11010102 | Eastern | Kailahun | Dea | Baiwalla |
| 2 | | 11010407 | Eastern | Kailahun | Dea | Sienga |
| 3 | | 11020306 | Eastern | Kailahun | Jawie | Lower Giebu |
| 4 | | 11020606 | Eastern | Kailahun | Jawie | Sowa |
| 5 | | 11020629 | Eastern | Kailahun | Jawie | Sowa |
| 6 | | 11030104 | Eastern | Kailahun | Kissi Kama | Dakaleley |
| 7 | | 11030312 | Eastern | Kailahun | Kissi Kama | Kama Toh |
| 8 | | 11040207 | Eastern | Kailahun | Kissi Teng | Konio |
| 9 | | 11040415 | Eastern | Kailahun | Kissi Teng | Lela |
| 10 | | 11050201 | Eastern | Kailahun | Kissi Tongi | Lower Konio |
| 11 | | 11050402 | Eastern | Kailahun | Kissi Tongi | Lower Tongi Tingi |
| 12 | | 11050514 | Eastern | Kailahun | Kissi Tongi | Upper Konio |
| 13 | RC | 11060106 | Eastern | Kailahun | Kpeje Bongre | Bongre |
| 14 | | 11060512 | Eastern | Kailahun | Kpeje Bongre | Manowa |
| 15 | RC | 11070205 | Eastern | Kailahun | Kpeje West | Kimaya |
| 16 | | 11080105 | Eastern | Kailahun | Luawa | Baoma |
| 17 | | 11080302 | Eastern | Kailahun | Luawa | Gbela |
| 18 | RC | 11080405 | Eastern | Kailahun | Luawa | Giehun |
| 19 | | 11080612 | Eastern | Kailahun | Luawa | Luawa Foguiya |
| 20 | | 11080638 | Eastern | Kailahun | Luawa | Luawa Foguiya |
| 21 | | 11080659 | Eastern | Kailahun | Luawa | Luawa Foguiya |
| 22 | | 11080804 | Eastern | Kailahun | Luawa | Mende Buima |
| 23 | | 11081014 | Eastern | Kailahun | Luawa | Upper Kpombali |
| 24 | | 11090207 | Eastern | Kailahun | Malema | Lower Sami |
| 25 | | 11090409 | Eastern | Kailahun | Malema | Pelegbambeima |
| 26 | | 11100107 | Eastern | Kailahun | Mandu | Gbongre |
| 27 | | 11100308 | Eastern | Kailahun | Mandu | Lower Kuiva |
| 28 | | 11100416 | Eastern | Kailahun | Mandu | Upper Kuiva |
| 29 | | 11110503 | Eastern | Kailahun | Njaluahun | Gboo |
| 30 | | 11110803 | Eastern | Kailahun | Njaluahun | Keimaya |
| 31 | | 11111012 | Eastern | Kailahun | Njaluahun | Sei I |
| 32 | | 11111205 | Eastern | Kailahun | Njaluahun | Upper Nyawa |
| 33 | | 11120405 | Eastern | Kailahun | Penguia | Lombama |
| 34 | | 11130105 | Eastern | Kailahun | Upper Bambara | Bambara |
| 35 | | 11130402 | Eastern | Kailahun | Upper Bambara | Golu |
| 36 | RC | 11130616 | Eastern | Kailahun | Upper Bambara | Naiahun |
| 37 | | 11140210 | Eastern | Kailahun | Yawei | Kuiva Buima |
| 38 | | 12010106 | Eastern | Kenema | Dama | Dakowa |
| 39 | | 12010404 | Eastern | Kenema | Dama | Fowai |
| 40 | | 12020105 | Eastern | Kenema | Dodo | Bambara |
| 41 | | 12020704 | Eastern | Kenema | Dodo | Seiwor |
| 42 | | 12030502 | Eastern | Kenema | Gaura | Sandaru |
| 43 | | 12040120 | Eastern | Kenema | Gorama Mende | Biatong |
| 44 | | 12040307 | Eastern | Kenema | Gorama Mende | Kaklawa |
| 45 | | 12040424 | Eastern | Kenema | Gorama Mende | Kualley |
| 46 | | 12050404 | Eastern | Kenema | Kandu Leppiama | Sonnie |
| 47 | | 12060209 | Eastern | Kenema | Koya | Koya Gbundohun |
| 48 | | 12080106 | Eastern | Kenema | Lower Bambara | Bonya |
| 49 | | 12080134 | Eastern | Kenema | Lower Bambara | Bonya |
| 50 | | 12080220 | Eastern | Kenema | Lower Bambara | Fallay |
| 51 | | 12080508 | Eastern | Kenema | Lower Bambara | Korjei Ngieya |
| 52 | | 12080628 | Eastern | Kenema | Lower Bambara | Nyawa |
| 53 | | 12080712 | Eastern | Kenema | Lower Bambara | Sei |
| 54 | RC | 12090503 | Eastern | Kenema | Malegohun | Konjo Yematanga |
| 55 | | 12110103 | Eastern | Kenema | Nomo | Faama |
| 56 | | 12120202 | Eastern | Kenema | Nongowa | Dakpana |
| 57 | | 12120508 | Eastern | Kenema | Nongowa | Kagbado Kamboima |

| 58 | RC | 12120801 | Eastern | Kenema | Nongowa | Kona Kpindibu |
| 59 | | 12130105 | Eastern | Kenema | Simbaru | Bundoryama |
| 60 | RC | 12130413 | Eastern | Kenema | Simbaru | Yalenga |
| 61 | | 12140303 | Eastern | Kenema | Small Bo | Kamboma |
| 62 | | 12140509 | Eastern | Kenema | Small Bo | Sowa |
| 63 | | 12150412 | Eastern | Kenema | Tunkia | Gorahun |
| 64 | | 12150705 | Eastern | Kenema | Tunkia | Taninahun |
| 65 | | 12160505 | Eastern | Kenema | Wandor | Songhai |
| 66 | | 12910217 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Burma |
| 67 | | 12910406 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Kpayama |
| 68 | RC | 12910512 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Lambayama |
| 69 | | 12910703 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Njaguema |
| 70 | | 12910803 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Shimbeck |
| 71 | | 12910820 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Shimbeck |
| 72 | | 12910920 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Technical/Gbongbotoh |
| 73 | | 12911006 | Eastern | Kenema | Kenema City | Gbo Kakajama A-Tilorma - Gbenderu |
| 74 | | 12911203 | Eastern | Kenema | Kenema City | Gbo Lambayama A-Gombu |
| 75 | | 12911319 | Eastern | Kenema | Kenema City | Gbo Lambayama A-Kondebotihun |
| 76 | RC | 12911614 | Eastern | Kenema | Kenema City | Gbo Lambayama A-Nyandeyama |
| 77 | | 12911709 | Eastern | Kenema | Kenema City | Gbo Lambayama A-Reservation |
| 78 | | 13010204 | Eastern | Kono | Fiama | Fiama |
| 79 | | 13020105 | Eastern | Kono | Gbane | Gbane Yemao |
| 80 | | 13020504 | Eastern | Kono | Gbane | Mongo |
| 81 | | 13030203 | Eastern | Kono | Gbane Kandor | Gbane Kour |
| 82 | | 13040303 | Eastern | Kono | Gbense | Banyakor |
| 83 | RC | 13050106 | Eastern | Kono | Gorama Kono | Bunabu |
| 84 | | 13060105 | Eastern | Kono | Kamara | Dangbaidu |
| 85 | | 13060312 | Eastern | Kono | Kamara | Kongofinja |
| 86 | | 13070406 | Eastern | Kono | Lei | Koaro |
| 87 | RC | 13070807 | Eastern | Kono | Lei | Tankoro |
| 88 | | 13080304 | Eastern | Kono | Mafindor | Mafindor |
| 89 | | 13090213 | Eastern | Kono | Nimikoro | Bandafafeh |
| 90 | | 13090231 | Eastern | Kono | Nimikoro | Bandafafeh |
| 91 | RC | 13090316 | Eastern | Kono | Nimikoro | Gbogboafeh |
| 92 | | 13090413 | Eastern | Kono | Nimikoro | Jaiama |
| 93 | | 13090504 | Eastern | Kono | Nimikoro | Masayiefeh |
| 94 | RC | 13100205 | Eastern | Kono | Nimiyama | Njagbakahun |
| 95 | | 13100314 | Eastern | Kono | Nimiyama | Njaifeh |
| 96 | | 13110108 | Eastern | Kono | Sandor | Bafinfeh |
| 97 | | 13110205 | Eastern | Kono | Sandor | Dangbaidu |
| 98 | | 13110301 | Eastern | Kono | Sandor | Fakongofeh |
| 99 | | 13110501 | Eastern | Kono | Sandor | Njeikor |
| 100 | | 13110607 | Eastern | Kono | Sandor | Samgbafeh |
| 101 | | 13110813 | Eastern | Kono | Sandor | Sumunjifeh |
| 102 | | 13110921 | Eastern | Kono | Sandor | Yawatanda |
| 103 | | 13120210 | Eastern | Kono | Soa | Kokongokuma |
| 104 | | 13120505 | Eastern | Kono | Soa | Sawa Buma |
| 105 | | 13130103 | Eastern | Kono | Tankoro | Njama |
| 106 | | 13910102 | Eastern | Kono | Koidu City | Gbense-Moindefeh A |
| 107 | | 13910201 | Eastern | Kono | Koidu City | Gbense-Moindefeh B |
| 108 | | 13910314 | Eastern | Kono | Koidu City | Gbense-Moindekor |
| 109 | | 13910336 | Eastern | Kono | Koidu City | Gbense-Moindekor |
| 110 | | 13910355 | Eastern | Kono | Koidu City | Gbense-Moindekor |
| 111 | | 13910509 | Eastern | Kono | Koidu City | Gbense-Vaama |
| 112 | | 13910607 | Eastern | Kono | Koidu City | Tankoro-Kinsey |
| 113 | | 13910708 | Eastern | Kono | Koidu City | Tankoro-Koakoyima |
| 114 | | 13910803 | Eastern | Kono | Koidu City | Tankoro-Lebanon |
| 115 | | 13910911 | Eastern | Kono | Koidu City | Tankoro-New Sembehun |
| 116 | RC | 13910923 | Eastern | Kono | Koidu City | Tankoro-New Sembehun |

| 117 | | 13910940 | Eastern | Kono | Koidu City | Tankoro-New Sembehun |
|---|---|---|---|---|---|---|
| 118 | | 21010201 | Northern | Bombali | Biriwa | Kabakeh Balandugu |
| 119 | RC | 21010409 | Northern | Bombali | Biriwa | Kamabai |
| 120 | | 21020101 | Northern | Bombali | Bombali Sebora | Kafala |
| 121 | | 21020219 | Northern | Bombali | Bombali Sebora | Kagbaran Dokom  B |
| 122 | | 21020406 | Northern | Bombali | Bombali Sebora | Matotoka |
| 123 | | 21030703 | Northern | Bombali | Gbanti Kamaranka | Makulon |
| 124 | | 21040102 | Northern | Bombali | Gbendembu Ngowahun | Garanganwa |
| 125 | | 21040602 | Northern | Bombali | Gbendembu Ngowahun | Lohindie |
| 126 | | 21041502 | Northern | Bombali | Gbendembu Ngowahun | Matehun |
| 127 | | 21050901 | Northern | Bombali | Libeisaygahun | Masangalie |
| 128 | | 21070102 | Northern | Bombali | Makari Gbanti | Gborbana |
| 129 | | 21070215 | Northern | Bombali | Makari Gbanti | Mabanta |
| 130 | | 21070506 | Northern | Bombali | Makari Gbanti | Mankneh Bana |
| 131 | | 21070704 | Northern | Bombali | Makari Gbanti | Masongbo B |
| 132 | | 21070905 | Northern | Bombali | Makari Gbanti | Mina Gbanti |
| 133 | | 21071301 | Northern | Bombali | Makari Gbanti | Yainkassa |
| 134 | | 21080504 | Northern | Bombali | Paki Masabong | Masabong Pil |
| 135 | | 21090112 | Northern | Bombali | Safroko Limba | Binkolo |
| 136 | | 21090503 | Northern | Bombali | Safroko Limba | Kayassi |
| 137 | | 21100502 | Northern | Bombali | Sanda Loko | Kania |
| 138 | | 21101101 | Northern | Bombali | Sanda Loko | Makwie Loko |
| 139 | | 21110301 | Northern | Bombali | Sanda Tendaran | Marampa |
| 140 | | 21110801 | Northern | Bombali | Sanda Tendaran | Rosos |
| 141 | | 21120215 | Northern | Bombali | Sella Limba | Kamakwie |
| 142 | | 21120407 | Northern | Bombali | Sella Limba | Kayimbor |
| 143 | | 21120804 | Northern | Bombali | Sella Limba | Samia |
| 144 | | 21130403 | Northern | Bombali | Tambakha | Simibue |
| 145 | | 21910110 | Northern | Bombali | Makeni City | Banana Ward |
| 146 | | 21910223 | Northern | Bombali | Makeni City | Kagbaran Dokom A |
| 147 | RC | 21910254 | Northern | Bombali | Makeni City | Kagbaran Dokom A |
| 148 | | 21910402 | Northern | Bombali | Makeni City | Maslasie Ward |
| 149 | | 21910523 | Northern | Bombali | Makeni City | Mayanka I Ward |
| 150 | RC | 21910716 | Northern | Bombali | Makeni City | Rogbaneh Ward |
| 151 | | 21910807 | Northern | Bombali | Makeni City | Teko Ward |
| 152 | RC | 21910912 | Northern | Bombali | Makeni City | Wusum Ward |
| 153 | | 22010603 | Northern | Kambia | Bramaia | Kabaya |
| 154 | | 22010801 | Northern | Kambia | Bramaia | Konta |
| 155 | | 22011008 | Northern | Kambia | Bramaia | Kukuna |
| 156 | | 22020404 | Northern | Kambia | Gbinle Dixing | Mafaray |
| 157 | | 22020704 | Northern | Kambia | Gbinle Dixing | Sanda |
| 158 | | 22030110 | Northern | Kambia | Magbema | Bombe |
| 159 | | 22030225 | Northern | Kambia | Magbema | Kamba |
| 160 | | 22030306 | Northern | Kambia | Magbema | Kambia |
| 161 | | 22030325 | Northern | Kambia | Magbema | Kambia |
| 162 | | 22030344 | Northern | Kambia | Magbema | Kambia |
| 163 | | 22030409 | Northern | Kambia | Magbema | Kargbulor |
| 164 | | 22030519 | Northern | Kambia | Magbema | Robat |
| 165 | | 22030541 | Northern | Kambia | Magbema | Robat |
| 166 | RC | 22030622 | Northern | Kambia | Magbema | Rokupr |
| 167 | | 22040102 | Northern | Kambia | Mambolo | Kalenkay |
| 168 | | 22040302 | Northern | Kambia | Mambolo | Matetie |
| 169 | | 22040503 | Northern | Kambia | Mambolo | Robis |
| 170 | | 22040702 | Northern | Kambia | Mambolo | Rotain Bana |
| 171 | RC | 22050203 | Northern | Kambia | Masungbala | Benna |
| 172 | | 22050601 | Northern | Kambia | Masungbala | Maserie |
| 173 | | 22051005 | Northern | Kambia | Masungbala | Samu |
| 174 | | 22060202 | Northern | Kambia | Samu | Kassiri |
| 175 | RC | 22060304 | Northern | Kambia | Samu | Koya |

| 176 |    | 22060601 | Northern | Kambia    | Samu                  | Mafufuneh         |
|-----|----|----------|----------|-----------|-----------------------|-------------------|
| 177 |    | 22060801 | Northern | Kambia    | Samu                  | Mange             |
| 178 |    | 22061003 | Northern | Kambia    | Samu                  | Moribaia          |
| 179 |    | 22061208 | Northern | Kambia    | Samu                  | Rosinor           |
| 180 |    | 22070113 | Northern | Kambia    | Tonko Limba           | Bubuya            |
| 181 |    | 22070207 | Northern | Kambia    | Tonko Limba           | Kamassassa        |
| 182 |    | 22070307 | Northern | Kambia    | Tonko Limba           | Kathanthineh      |
| 183 |    | 22070407 | Northern | Kambia    | Tonko Limba           | Magbonkoh         |
| 184 | RC | 22070606 | Northern | Kambia    | Tonko Limba           | Yebaya            |
| 185 |    | 23010501 | Northern | Koinadugu | Dembelia-Sinkunia     | Mannah            |
| 186 | RC | 23010901 | Northern | Koinadugu | Dembelia-Sinkunia     | Sinkunia II       |
| 187 |    | 23020114 | Northern | Koinadugu | Diang                 | Darakuru          |
| 188 | RC | 23020302 | Northern | Koinadugu | Diang                 | Kania             |
| 189 |    | 23020406 | Northern | Koinadugu | Diang                 | Kondembaia        |
| 190 |    | 23030203 | Northern | Koinadugu | Folosaba Dembelia     | Dogoloya          |
| 191 |    | 23030712 | Northern | Koinadugu | Folosaba Dembelia     | Kalia             |
| 192 |    | 23031202 | Northern | Koinadugu | Folosaba Dembelia     | Sankan II         |
| 193 |    | 23040405 | Northern | Koinadugu | Kasunko               | Kakallain         |
| 194 |    | 23040514 | Northern | Koinadugu | Kasunko               | Kasunko           |
| 195 |    | 23041004 | Northern | Koinadugu | Kasunko               | Tamiso II         |
| 196 |    | 23050209 | Northern | Koinadugu | Mongo                 | Lower Deldugu     |
| 197 |    | 23050409 | Northern | Koinadugu | Mongo                 | Mongo I           |
| 198 |    | 23050610 | Northern | Koinadugu | Mongo                 | Mongo III         |
| 199 | RC | 23050804 | Northern | Koinadugu | Mongo                 | Morifindugu II    |
| 200 | RC | 23060105 | Northern | Koinadugu | Neya                  | Kulor             |
| 201 |    | 23060401 | Northern | Koinadugu | Neya                  | Neya II           |
| 202 |    | 23060508 | Northern | Koinadugu | Neya                  | Nyedu             |
| 203 |    | 23060704 | Northern | Koinadugu | Neya                  | Upper Saradu      |
| 205 |    | 23070209 | Northern | Koinadugu | Nieni                 | Kalian            |
| 206 |    | 23070227 | Northern | Koinadugu | Nieni                 | Kalian            |
| 207 |    | 23070303 | Northern | Koinadugu | Nieni                 | Nieni             |
| 208 |    | 23070320 | Northern | Koinadugu | Nieni                 | Nieni             |
| 209 | RC | 23070405 | Northern | Koinadugu | Nieni                 | Seradu            |
| 210 |    | 23070422 | Northern | Koinadugu | Nieni                 | Seradu            |
| 211 |    | 23080106 | Northern | Koinadugu | Sengbe                | Bendugu           |
| 212 |    | 23080406 | Northern | Koinadugu | Sengbe                | Koinadugu         |
| 213 |    | 23080607 | Northern | Koinadugu | Sengbe                | Upper Kamadugu    |
| 214 |    | 23080809 | Northern | Koinadugu | Sengbe                | Yogomaia          |
| 215 |    | 23090401 | Northern | Koinadugu | Sulima                | Falaba I          |
| 216 |    | 23090801 | Northern | Koinadugu | Sulima                | Gberia-Timbako    |
| 217 |    | 23091101 | Northern | Koinadugu | Sulima                | Koindu-Kura       |
| 218 |    | 23091801 | Northern | Koinadugu | Sulima                | Sonkoya           |
| 219 |    | 23100201 | Northern | Koinadugu | Wara Wara Bafodia     | Kadanso           |
| 220 |    | 23100602 | Northern | Koinadugu | Wara Wara Bafodia     | Kambalia/Serekudo |
| 221 |    | 23101301 | Northern | Koinadugu | Wara Wara Bafodia     | Taelia            |
| 222 |    | 23110203 | Northern | Koinadugu | Wara Wara Yagala      | Zone 2            |
| 223 |    | 23110318 | Northern | Koinadugu | Wara Wara Yagala      | Zone 3            |
| 224 |    | 23110337 | Northern | Koinadugu | Wara Wara Yagala      | Zone 3            |
| 225 |    | 23110403 | Northern | Koinadugu | Wara Wara Yagala      | Zone 4            |
| 226 |    | 23110704 | Northern | Koinadugu | Wara Wara Yagala      | Zone 7            |
| 227 |    | 24010801 | Northern | Port Loko | Bureh Kasseh Makonteh | Makana            |
| 228 |    | 24020102 | Northern | Port Loko | Buya Romende          | Foredugu          |
| 229 |    | 24020501 | Northern | Port Loko | Buya Romende          | Mabureh Mende     |
| 230 |    | 24030201 | Northern | Port Loko | Dibia                 | Kayembor          |
| 231 |    | 24040108 | Northern | Port Loko | Kaffu Bullom          | Foronkoya         |
| 232 | RC | 24040132 | Northern | Port Loko | Kaffu Bullom          | Foronkoya         |
| 233 |    | 24040224 | Northern | Port Loko | Kaffu Bullom          | Kasongha          |
| 234 |    | 24040404 | Northern | Port Loko | Kaffu Bullom          | Mahera            |
| 235 |    | 24040611 | Northern | Port Loko | Kaffu Bullom          | Mayaya            |

| 236 | | 24040807 | Northern | Port Loko | Kaffu Bullom | Yongro |
|---|---|---|---|---|---|---|
| 237 | | 24050306 | Northern | Port Loko | Koya | Foredugu |
| 238 | | 24050805 | Northern | Port Loko | Koya | Mandoma |
| 239 | | 24051210 | Northern | Port Loko | Koya | Matheneh |
| 240 | | 24051508 | Northern | Port Loko | Koya | Robia |
| 241 | | 24060202 | Northern | Port Loko | Lokomasama | Gbainty |
| 242 | | 24060310 | Northern | Port Loko | Lokomasama | Kamasondo |
| 243 | | 24060707 | Northern | Port Loko | Lokomasama | Konta |
| 244 | | 24061404 | Northern | Port Loko | Lokomasama | Yurika |
| 245 | | 24070107 | Northern | Port Loko | Maforki | Batpolon |
| 246 | | 24070509 | Northern | Port Loko | Maforki | Gberray Morie |
| 247 | | 24071013 | Northern | Port Loko | Maforki | Kondato |
| 248 | RC | 24071902 | Northern | Port Loko | Maforki | Mapolie |
| 249 | | 24072605 | Northern | Port Loko | Maforki | Romaka |
| 250 | | 24073002 | Northern | Port Loko | Maforki | Tauya |
| 251 | | 24080413 | Northern | Port Loko | Marampa | Marampa A |
| 252 | | 24080460 | Northern | Port Loko | Marampa | Marampa A |
| 253 | | 24080507 | Northern | Port Loko | Marampa | Mawullay |
| 254 | | 24090304 | Northern | Port Loko | Masimera | Katick |
| 255 | | 24090902 | Northern | Port Loko | Masimera | Nonkoba |
| 256 | RC | 24100304 | Northern | Port Loko | Sanda Magbolont | Gbogbodo |
| 257 | | 24110303 | Northern | Port Loko | TMS | Kanu |
| 258 | RC | 24111004 | Northern | Port Loko | TMS | Maron |
| 259 | | 25010304 | Northern | Tonkolili | Gbonkolenken | Mayeppoh |
| 260 | | 25010407 | Northern | Tonkolili | Gbonkolenken | Petifu Bana |
| 261 | | 25010707 | Northern | Tonkolili | Gbonkolenken | Upper Massakong |
| 262 | | 25010914 | Northern | Tonkolili | Gbonkolenken | Yele Manowo |
| 263 | | 25020101 | Northern | Tonkolili | Kafe Simiria | Kabaia |
| 264 | | 25020403 | Northern | Tonkolili | Kafe Simiria | Makelfa |
| 265 | RC | 25020601 | Northern | Tonkolili | Kafe Simiria | Mayaso |
| 266 | | 25030211 | Northern | Tonkolili | Kalansogoia | Bumbuna |
| 267 | | 25030502 | Northern | Tonkolili | Kalansogoia | Kamakathie |
| 268 | | 25040204 | Northern | Tonkolili | Kholifa Mabang | Mabang |
| 269 | | 25050104 | Northern | Tonkolili | Kholifa Rowala | Bo Road |
| 270 | | 25050204 | Northern | Tonkolili | Kholifa Rowala | Lal-Lenken |
| 271 | | 25050233 | Northern | Tonkolili | Kholifa Rowala | Lal-Lenken |
| 272 | | 25050406 | Northern | Tonkolili | Kholifa Rowala | Mamuntha |
| 273 | RC | 25050602 | Northern | Tonkolili | Kholifa Rowala | Mayossoh |
| 274 | | 25050715 | Northern | Tonkolili | Kholifa Rowala | Old Magburaka |
| 275 | | 25060210 | Northern | Tonkolili | Kunike Barina | Makong |
| 276 | | 25070103 | Northern | Tonkolili | Kunike | Masingbi |
| 277 | | 25070120 | Northern | Tonkolili | Kunike | Masingbi |
| 278 | | 25070313 | Northern | Tonkolili | Kunike | Sanda |
| 279 | | 25070509 | Northern | Tonkolili | Kunike | Thamah |
| 280 | | 25070613 | Northern | Tonkolili | Kunike | Thambaya |
| 281 | | 25070809 | Northern | Tonkolili | Kunike | Yenkeh |
| 282 | | 25080404 | Northern | Tonkolili | Malal Mara | Malal |
| 283 | | 25080806 | Northern | Tonkolili | Malal Mara | Rochen |
| 284 | RC | 25090214 | Northern | Tonkolili | Sambaya | Buyan |
| 285 | | 25090413 | Northern | Tonkolili | Sambaya | Sambaya |
| 286 | | 25100403 | Northern | Tonkolili | Tane | Mapakie |
| 287 | | 25100609 | Northern | Tonkolili | Tane | Matotoka |
| 288 | | 25110105 | Northern | Tonkolili | Yoni | Foindu |
| 289 | | 25110215 | Northern | Tonkolili | Yoni | Gaindema |
| 290 | | 25110237 | Northern | Tonkolili | Yoni | Gaindema |
| 291 | | 25110262 | Northern | Tonkolili | Yoni | Gaindema |
| 292 | | 25110419 | Northern | Tonkolili | Yoni | Makeni Rokefula |
| 293 | | 25110709 | Northern | Tonkolili | Yoni | Mamaka |
| 294 | | 25110908 | Northern | Tonkolili | Yoni | Mayira |

| 295 | RC | 25111107 | Northern | Tonkolili | Yoni | Ronietta |
|---|---|---|---|---|---|---|
| 296 | | 25111217 | Northern | Tonkolili | Yoni | Yoni |
| 297 | | 31010102 | Southern | Bo | Badjia | Damai |
| 298 | | 31020307 | Southern | Bo | Bagbo | Jimmi |
| 299 | | 31020706 | Southern | Bo | Bagbo | Tissana |
| 300 | | 31030405 | Southern | Bo | Bagbwe(Bagbe) | Nyallay |
| 301 | | 31040122 | Southern | Bo | Boama | Bambawo |
| 302 | | 31040503 | Southern | Bo | Boama | Mawojeh |
| 303 | RC | 31040806 | Southern | Bo | Boama | Upper Pataloo |
| 304 | | 31050401 | Southern | Bo | Bumpe Ngao | Kpetema |
| 305 | | 31050709 | Southern | Bo | Bumpe Ngao | Sewama |
| 306 | | 31051002 | Southern | Bo | Bumpe Ngao | Yengema |
| 307 | | 31070301 | Southern | Bo | Jaiama Bongor | Lower Niawa |
| 308 | | 31070704 | Southern | Bo | Jaiama Bongor | Upper Kama |
| 309 | | 31080401 | Southern | Bo | Kakua | Nyallay |
| 310 | | 31080620 | Southern | Bo | Kakua | Samamie |
| 311 | RC | 31080805 | Southern | Bo | Kakua | Sindeh |
| 312 | | 31100104 | Southern | Bo | Lugbu | Gao |
| 313 | | 31100401 | Southern | Bo | Lugbu | Kemoh |
| 314 | RC | 31110304 | Southern | Bo | Niawa Lenga | Upper Niawa |
| 315 | | 31130401 | Southern | Bo | Tikonko | Ngolamajie |
| 316 | | 31130704 | Southern | Bo | Tikonko | Seiwa |
| 317 | | 31130727 | Southern | Bo | Tikonko | Seiwa |
| 318 | | 31140110 | Southern | Bo | Valunia | Deilenga |
| 319 | | 31140317 | Southern | Bo | Valunia | Lunia |
| 320 | | 31150203 | Southern | Bo | Wonde | Lower Kargoi |
| 321 | | 31910214 | Southern | Bo | Bo Town | East Ward-Bumpeh-Wo - Torkpoi Town |
| 322 | | 31910419 | Southern | Bo | Bo Town | East Ward-Kindia Town-Yimoh Town |
| 323 | | 31910611 | Southern | Bo | Bo Town | East Ward-Manjama – Shellmingo |
| 324 | RC | 31910906 | Southern | Bo | Bo Town | East Ward-Moriba Town-New site |
| 325 | | 31911011 | Southern | Bo | Bo Town | North Ward-Bo Number Two-Borborkombo |
| 326 | | 31911211 | Southern | Bo | Bo Town | North Ward-Kissy Town-Samamie |
| 327 | | 31911504 | Southern | Bo | Bo Town | North Ward-Reservation II |
| 328 | | 31911807 | Southern | Bo | Bo Town | West Ward-Moriba Town - Sewa Road |
| 329 | | 31911908 | Southern | Bo | Bo Town | West Ward-Nikibu - Bo School |
| 330 | | 32010101 | Southern | Bonthe | Bendu-Cha | Gba-Cha |
| 331 | | 32010403 | Southern | Bonthe | Bendu-Cha | Yallan-gbokie |
| 332 | | 32020301 | Southern | Bonthe | Bum | Gbondubum |
| 333 | | 32020404 | Southern | Bonthe | Bum | Koimato |
| 334 | RC | 32020509 | Southern | Bonthe | Bum | Lanje |
| 335 | | 32020707 | Southern | Bonthe | Bum | Torma |
| 336 | | 32020904 | Southern | Bonthe | Bum | Yawma |
| 337 | | 32030203 | Southern | Bonthe | Dema | Dema |
| 338 | | 32040102 | Southern | Bonthe | Imperri | Babum |
| 339 | | 32040109 | Southern | Bonthe | Imperri | Babum |
| 340 | | 32040119 | Southern | Bonthe | Imperri | Babum |
| 341 | | 32040130 | Southern | Bonthe | Imperri | Babum |
| 342 | | 32040301 | Southern | Bonthe | Imperri | Bigo |
| 343 | | 32040312 | Southern | Bonthe | Imperri | Bigo |
| 344 | | 32040507 | Southern | Bonthe | Imperri | Moimaligie |
| 345 | RC | 32050105 | Southern | Bonthe | Jong | Basiaka |
| 346 | | 32050209 | Southern | Bonthe | Jong | Bayengbe |
| 347 | | 32050220 | Southern | Bonthe | Jong | Bayengbe |
| 348 | RC | 32050307 | Southern | Bonthe | Jong | Beyinga |
| 349 | | 32050501 | Southern | Bonthe | Jong | Kumabeh-Kwe |
| 350 | | 32050607 | Southern | Bonthe | Jong | Landi-Ngere |
| 351 | RC | 32050707 | Southern | Bonthe | Jong | Sopan-Cleveland |
| 352 | | 32060301 | Southern | Bonthe | Kpanda Kemo | Gbonge |
| 353 | | 32060601 | Southern | Bonthe | Kpanda Kemo | Taokunor |

| 354 |    | 32070302 | Southern | Bonthe | Kwamebai Krim | Massa Settie |
|-----|----|----------|----------|--------|---------------|--------------|
| 355 |    | 32070603 | Southern | Bonthe | Kwamebai Krim | Tun-Tun Sullay |
| 356 |    | 32080202 | Southern | Bonthe | Nongoba Bullom | Bohol |
| 357 |    | 32080602 | Southern | Bonthe | Nongoba Bullom | Gbap |
| 358 |    | 32081001 | Southern | Bonthe | Nongoba Bullom | Pelewahun |
| 359 |    | 32081304 | Southern | Bonthe | Nongoba Bullom | Torma Subu |
| 360 |    | 32090204 | Southern | Bonthe | Sittia | Gonoh |
| 361 |    | 32090501 | Southern | Bonthe | Sittia | Moh |
| 362 |    | 32090806 | Southern | Bonthe | Sittia | Sahaya |
| 363 |    | 32100202 | Southern | Bonthe | Sogbeni | Beyorgboh |
| 364 |    | 32100404 | Southern | Bonthe | Sogbeni | Pengor |
| 365 |    | 32110302 | Southern | Bonthe | Yawbeko | Kataway |
| 366 |    | 32910105 | Southern | Bonthe | Bonthe Urban | Bonthe Town |
| 367 |    | 33010106 | Southern | Moyamba | Bagruwa | Benduma |
| 368 |    | 33010503 | Southern | Moyamba | Bagruwa | Mani |
| 369 |    | 33010904 | Southern | Moyamba | Bagruwa | Sembehun |
| 370 |    | 33020302 | Southern | Moyamba | Bumpeh | Greema |
| 371 |    | 33020506 | Southern | Moyamba | Bumpeh | Mamu |
| 372 |    | 33020902 | Southern | Moyamba | Bumpeh | Motobon |
| 373 | RC | 33021306 | Southern | Moyamba | Bumpeh | Yengessa |
| 374 |    | 33030901 | Southern | Moyamba | Dasse | Semabu |
| 375 |    | 33040302 | Southern | Moyamba | Fakunya | Kovella |
| 376 |    | 33040705 | Southern | Moyamba | Fakunya | Njawa |
| 377 |    | 33041005 | Southern | Moyamba | Fakunya | To – Ndambalenga |
| 378 |    | 33050304 | Southern | Moyamba | Kagboro | Bumpetoke |
| 379 |    | 33051002 | Southern | Moyamba | Kagboro | Mokandor |
| 380 |    | 33051804 | Southern | Moyamba | Kagboro | Tassor |
| 381 |    | 33052105 | Southern | Moyamba | Kagboro | Youndu |
| 382 |    | 33060205 | Southern | Moyamba | Kaiyamba | Koromboya |
| 383 |    | 33060304 | Southern | Moyamba | Kaiyamba | Kpange |
| 384 |    | 33060609 | Southern | Moyamba | Kaiyamba | Mosoe |
| 385 |    | 33070603 | Southern | Moyamba | Kamajei | Tawovehun |
| 386 |    | 33080603 | Southern | Moyamba | Kongbora | Mosongla/Lawana |
| 387 |    | 33090210 | Southern | Moyamba | Kori | Zone – 2 |
| 388 |    | 33090403 | Southern | Moyamba | Kori | Zone – 4 |
| 389 | RC | 33090708 | Southern | Moyamba | Kori | Zone – 7 |
| 390 |    | 33100503 | Southern | Moyamba | Kowa | Njagbahun |
| 391 |    | 33110207 | Southern | Moyamba | Lower Banta | Gbangbatoke |
| 392 | RC | 33110307 | Southern | Moyamba | Lower Banta | Largoh |
| 393 |    | 33110604 | Southern | Moyamba | Lower Banta | Ndendemoya |
| 394 |    | 33110903 | Southern | Moyamba | Lower Banta | Wulbange |
| 395 | RC | 33120305 | Southern | Moyamba | Ribbi | Masanka |
| 396 |    | 33120605 | Southern | Moyamba | Ribbi | Masarakulay |
| 397 |    | 33120904 | Southern | Moyamba | Ribbi | Upper Ribbi |
| 398 |    | 33130701 | Southern | Moyamba | Timdale | Mando |
| 399 |    | 33140303 | Southern | Moyamba | Upper Banta | Kepay |
| 400 |    | 34010207 | Southern | Pujehun | Barri | Fallay |
| 401 |    | 34010307 | Southern | Pujehun | Barri | Jougba |
| 402 |    | 34010702 | Southern | Pujehun | Barri | Sonjour I |
| 403 |    | 34020101 | Southern | Pujehun | Galliness Perri | Bondor |
| 404 |    | 34020404 | Southern | Pujehun | Galliness Perri | Gendema I |
| 405 |    | 34020706 | Southern | Pujehun | Galliness Perri | Jakema II |
| 406 |    | 34021006 | Southern | Pujehun | Galliness Perri | Kortugbu |
| 407 |    | 34021304 | Southern | Pujehun | Galliness Perri | Pelegbulor |
| 408 | RC | 34030308 | Southern | Pujehun | Kpaka | Jassende Ngoleima I |
| 409 |    | 34030811 | Southern | Pujehun | Kpaka | Sarbah |
| 410 |    | 34040301 | Southern | Pujehun | Panga Kabonde | Kabonde |
| 411 |    | 34040503 | Southern | Pujehun | Panga Kabonde | Lower Kayiemba |
| 412 |    | 34040610 | Southern | Pujehun | Panga Kabonde | Panga |

| 413 |    | 34040701 | Southern | Pujehun | Panga Kabonde | Pessekeh |
| 414 | RC | 34040903 | Southern | Pujehun | Panga Kabonde | Setti - Yakanday |
| 415 |    | 34050201 | Southern | Pujehun | Makpele | Samagbe |
| 416 |    | 34050211 | Southern | Pujehun | Makpele | Samagbe |
| 417 |    | 34050409 | Southern | Pujehun | Makpele | Selimeh |
| 418 |    | 34060103 | Southern | Pujehun | Malen | Bahoin |
| 419 |    | 34060302 | Southern | Pujehun | Malen | Kakpanda |
| 420 | RC | 34060506 | Southern | Pujehun | Malen | Korwa |
| 421 |    | 34060607 | Southern | Pujehun | Malen | Lower Pemba |
| 422 |    | 34060902 | Southern | Pujehun | Malen | Upper Pemba |
| 423 |    | 34070503 | Southern | Pujehun | Mono Sakrim | Pembaar |
| 424 | RC | 34080302 | Southern | Pujehun | Panga krim | Samba |
| 425 |    | 34090301 | Southern | Pujehun | Pejeh(Futa peje | Pejeh West |
| 426 |    | 34100206 | Southern | Pujehun | Soro Gbema | Kemokai |
| 427 |    | 34100501 | Southern | Pujehun | Soro Gbema | Massaquoi I |
| 428 |    | 34100702 | Southern | Pujehun | Soro Gbema | Moiwebu |
| 429 |    | 34100813 | Southern | Pujehun | Soro Gbema | Zoker I |
| 430 |    | 34110204 | Southern | Pujehun | Sowa | Sabba I |
| 431 |    | 34110408 | Southern | Pujehun | Sowa | Upper Geoma |
| 432 |    | 34121002 | Southern | Pujehun | Yakemu Kpukumu | Seiwoh |
| 433 |    | 41010101 | Western | W. A. Rural | Koya Rural | Fabaina Area |
| 434 |    | 41010104 | Western | W. A. Rural | Koya Rural | Fabaina Area |
| 435 |    | 41010201 | Western | W. A. Rural | Koya Rural | Madonkeh |
| 436 |    | 41010203 | Western | W. A. Rural | Koya Rural | Madonkeh |
| 437 |    | 41010302 | Western | W. A. Rural | Koya Rural | Magbafti |
| 438 |    | 41010305 | Western | W. A. Rural | Koya Rural | Magbafti |
| 439 |    | 41010308 | Western | W. A. Rural | Koya Rural | Magbafti |
| 440 |    | 41010311 | Western | W. A. Rural | Koya Rural | Magbafti |
| 441 |    | 41010466 | Western | W. A.Rural | Koya Rural | Malambay |
| 442 |    | 41010468 | Western | W. A. Rural | Koya Rural | Malambay |
| 443 |    | 41010469 | Western | W. A. Rural | Koya Rural | Malambay |
| 444 | RC | 41010502 | Western | W. A. Rural | Koya Rural | Newton |
| 445 |    | 41010520 | Western | W. A. Rural | Koya Rural | Newton |
| 446 |    | 41010521 | Western | W. A. Rural | Koya Rural | Newton |
| 447 |    | 41010601 | Western | W. A. Rural | Koya Rural | Songo |
| 448 |    | 41010602 | Western | W. A. Rural | Koya Rural | Songo |
| 449 |    | 41020201 | Western | W. A. Rural | Mountain Rural | Charlotte |
| 450 |    | 41020531 | Western | W. A.Rural | Mountain Rural | Regent |
| 451 |    | 41030101 | Western | W. A. Rural | Waterloo Rural | Deep Eye Water/Devil Hole |
| 452 |    | 41030226 | Western | W. A. Rural | Waterloo Rural | Hastings-Yams Farm |
| 453 |    | 41030402 | Western | W. A. Rural | Waterloo Rural | Rokel |
| 454 |    | 41030542 | Western | W. A. Rural | Waterloo Rural | Waterloo Benguema |
| 455 |    | 41030543 | Western | W. A. Rural | Waterloo Rural | Waterloo Benguema |
| 456 |    | 41030601 | Western | W. A. Rural | Waterloo Rural | Waterlooo Campbell Town |
| 457 |    | 41030661 | Western | W. A. Rural | Waterloo Rural | Waterlooo Campbell Town |
| 458 |    | 41030701 | Western | W. A. Rural | Waterloo Rural | Waterloo Lumpa |
| 459 |    | 41030760 | Western | W. A. Rural | Waterloo Rural | Waterloo Lumpa |
| 460 |    | 41040215 | Western | W. A. Rural | York Rural | Goderich-Adonkia/Milton Margai |
| 461 |    | 41040305 | Western | W. A. Rural | York Rural | Goderich-Funkia |
| 462 |    | 41040324 | Western | W. A. Rural | York Rural | Goderich-Funkia |
| 463 |    | 41040412 | Western | W. A. Rural | York Rural | Hamilton |
| 464 |    | 41040413 | Western | W. A. Rural | York Rural | Hamilton |
| 465 |    | 41040414 | Western | W. A. Rural | York Rural | Hamilton |
| 466 |    | 41040415 | Western | W. A. Rural | York Rural | Hamilton |
| 467 |    | 41040416 | Western | W. A. Rural | York Rural | Hamilton |
| 468 |    | 41040504 | Western | W. A. Rural | York Rural | Kent |
| 469 |    | 41040507 | Western | W. A. Rural | York Rural | Kent |
| 470 |    | 41040508 | Western | W. A. Rural | York Rural | Kent |
| 471 |    | 41040601 | Western | W. A. Rural | York Rural | Sattia/Tombo |

| 472 | | 41040603 | Western | W. A. Rural | York Rural | Sattia/Tombo |
| 473 | | 41040604 | Western | W. A. Rural | York Rural | Sattia/Tombo |
| 474 | | 41040606 | Western | W. A. Rural | York Rural | Sattia/Tombo |
| 475 | | 41040608 | Western | W. A. Rural | York Rural | Sattia/Tombo |
| 476 | | 41040648 | Western | W. A. Rural | York Rural | Sattia/Tombo |
| 477 | | 41040701 | Western | W. A. Rural | York Rural | York |
| 478 | | 41040703 | Western | W. A. Rural | York Rural | York |
| 479 | | 42010206 | Western | W. A. Urban | Central I | Mountain Regent |
| 480 | | 42010409 | Western | W. A. Slums | Central I | Susan' s Bay |
| 481 | | 42010419 | Western | W. A. Slums | Central I | Susan' s Bay |
| 482 | | 42010430 | Western | W. A. Slums | Central I | Susan' s Bay |
| 483 | | 42010510 | Western | W. A. Urban | Central I | Tower Hill |
| 484 | | 42020115 | Western | W. A. Urban | Central II | Connaught Hospital |
| 485 | | 42030106 | Western | W. A. Slums | East I | Cline Town |
| 486 | | 42030113 | Western | W. A. Slums | East I | Cline Town |
| 487 | | 42030121 | Western | W. A. Slums | East I | Cline Town |
| 488 | | 42030127 | Western | W. A. Urban | East I | Cline Town |
| 489 | | 42030237 | Western | W. A. Urban | East I | Fourah Bay |
| 490 | | 42030307 | Western | W. A. Urban | East I | Kossoh Town |
| 491 | | 42040220 | Western | W. A. Urban | East II | Foulah Town |
| 492 | | 42040409 | Western | W. A. Urban | East II | Kissy Brook I |
| 493 | | 42040504 | Western | W. A. Urban | East II | Magazine |
| 494 | | 42040523 | Western | W. A. Urban | East II | Magazine |
| 495 | | 42050213 | Western | W. A. Urban | East III | Allen Town II |
| 496 | | 42050312 | Western | W. A. Slums | East III | Bottom Oku |
| 497 | | 42050504 | Western | W. A. Slums | East III | Congo Water II |
| 498 | | 42050602 | Western | W. A. Urban | East III | Grass Field |
| 499 | | 42050708 | Western | W. A. Urban | East III | Industrial Estate |
| 500 | | 42050906 | Western | W. A. Urban | East III | Kissy Brook II |
| 501 | | 42051006 | Western | W. A. Urban | East III | Kissy Bye Pass(Dock) |
| 502 | | 42051012 | Western | W. A. Urban | East III | Kissy Bye Pass(Dock) |
| 503 | | 42051029 | Western | W. A. Urban | East III | Kissy Bye Pass(Dock) |
| 504 | | 42051107 | Western | W. A. Urban | East III | Kissy Bye Pass(Term) |
| 505 | | 42051116 | Western | W. A. Urban | East III | Kissy Bye Pass(Term) |
| 506 | | 42051209 | Western | W. A. Urban | East III | Kissy Mental |
| 507 | | 42051510 | Western | W. A. Urban | East III | Lowcost Housing |
| 508 | | 42051807 | Western | W. A. Urban | East III | Mayenkineh |
| 509 | | 42051909 | Western | W. A. Urban | East III | Old Warf |
| 510 | | 42052010 | Western | W. A. Urban | East III | Pamuronko |
| 511 | | 42052023 | Western | W. A. Urban | East III | Pamuronko |
| 512 | | 42052108 | Western | W. A. Urban | East III | Portee |
| 513 | | 42052138 | Western | W. A. Urban | East III | Portee |
| 514 | | 42052304 | Western | W. A. Urban | East III | Rokupa |
| 515 | | 42052310 | Western | W. A. Urban | East III | Rokupa |
| 516 | | 42052421 | Western | W. A. Urban | East III | Shell |
| 517 | | 42060102 | Western | W. A. Urban | West I | Ascension Town |
| 518 | | 42060215 | Western | W. A. Urban | West I | Brookfields |
| 519 | | 42060308 | Western | W. A. Urban | West I | Kingtom |
| 520 | | 42060329 | Western | W. A. Urban | West I | Kingtom |
| 521 | | 42070128 | Western | W. A. Urban | West II | Brookfields-Congo |
| 522 | | 42070303 | Western | W. A. Urban | West II | CongoTown |
| 523 | | 42070309 | Western | W. A. Urban | West II | CongoTown |
| 524 | | 42070321 | Western | W. A. Urban | West II | CongoTown |
| 525 | | 42070427 | Western | W. A. Urban | West II | George Brook (Dwor |
| 526 | | 42070701 | Western | W. A. Urban | West II | Sumaila Town |
| 527 | | 42080110 | Western | W. A. Urban | West III | Aberdeen |
| 528 | | 42080124 | Western | W. A. Urban | West III | Aberdeen |
| 529 | | 42080205 | Western | W. A. Urban | West III | Cockerill-Aberdeen |
| 530 | | 42080314 | Western | W. A. Urban | West III | Cockle-Bay /Collegiate |

| 531 | | 42080341 | Western | W. A. Urban | West III | Cockle-Bay /Collegiate |
|-----|--|----------|---------|-------------|----------|------------------------|
| 532 | | 42080351 | Western | W. A. Urban | West III | Cockle-Bay /Collegiate |
| 533 | | 42080430 | Western | W. A. Urban | West III | Hill Station |
| 534 | | 42080624 | Western | W. A. Urban | West III | Lumley |
| 535 | | 42080823 | Western | W. A. Urban | West III | Murray Town |
| 536 | | 42080838 | Western | W. A. Urban | West III | Murray Town |
| 537 | | 42081056 | Western | W. A. Urban | West III | Wilberforce |

## 10. REFERENCES

AUC/UNECA/WFP (2013), The Cost of Hunger in Africa: Social and Economic Impact of Child Undernutrition

Bhutta, Zulfiqar. A., Jai K Das, Arjumand Rizvi, Michelle FGaff ey, Neff Walker, Susan Horton, Patrick Webb, Anna Lartey, Robert E Black, he Lancet Nutrition Interventions Review Group, and the Maternal and Child Nutrition Study Group. 2013. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? Lancet 2013; 382: 452–77 http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736 (13)60996-4.pdf (Accessed October 30, 2017).

Black RE, Victora CG, Walker SP et al (2013). 'Maternal and Child Nutrition: Maternal and Child Undernutrition and Overweight in Low-income and Middle-income Countries': The Lancet Series 382: 427–51.

Care (2010), Infant and Young Child Feeding Practices, Collecting and Using Data: A Step-by-Step guide.

FAO and FHI 360 (2016). Minimum Dietary Diversity for Women: A Guide for Measurement. Food and Agriculture Organization of the United Nations and USAID's Food and Nutrition Technical Assistance III Project (FANTA). Rome: FAO.

GoSL/MoHS (2016). Annual Health Sector Performance Report 2016. Government of Sierra Leone Ministry of Health and Sanitation.

Ministry of Health and Sanitation Sierra Leone and UNICEF Sierra Leone ( 2014). Sierra Leone National Nutrition Survey 2014. Freetown, Sierra Leone.

Ministry of Health and Sanitation Sierra Leone and UNICEF Sierra Leone ( 2010). Sierra Leone National Nutrition Survey 2010. Freetown, Sierra Leone.

Onis, Mercedes de, Kathryn G. Dewey, Elaine Borghi, Adelheid W. Onyango, Monika Blössner, Bernadette Daelmans,‡ Ellen Piwoz§ and Francesco Branca. 2013. The World Health Organization's Global Target for Reducing Childhood Stunting by 2025: Rationale and Proposed Actions Maternal and Child Nutrition (2013), 9 (Suppl. 2), pp. 6–26 http://www.cmamforum.org/pool/resources/who-globaltarget-for-reducing-childhood-stunting-by-2025-2013.pdf

Prendergast, Andrew J. and Jean H. Humphrey. 2014. "The Stunting Syndrome in Developing Countries", Paediatrics and International Child Health, Vol. 34, No. 4, pp. 250-265. http://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC4232245&blobtype=pdf.

SMART (2006). Measuring Mortality, Nutritional Status, and Food Security in Crisis Situations: SMART Methodology Retrieved from http://smartmethodology.org/survey-planning-tools/smart-methodology/smart-methodology-manual/

SPHERE (2011). The Sphere Project: Humanitarian Charter and Minimum Standards in Humanitarian Response; U.K.

SL CFSVA (2015). The State of Food Security in Sierra Leone 2015. Comprehensive Food Security and Vulnerability Analysis (CFSVA). Ministry of Agriculture, Forestry and Food Security (MAFFS), the Food and Agriculture Organization (FAO) and the World Food Programme (WFP).

SSL (2016). Sierra Leone National Population and Housing Census 2015. Statistics Sierra Leone. A.J. Momoh Street Tower Hill Freetown.

SSL/ICFI (2014). 'Sierra Leone Demographic and Health Survey 2013'; Statistics Sierra Leone and ICF International: Freetown, Sierra Leone and Rockville, Maryland, USA.

United Nations Children's Fund (UNICEF). 2013. Improving Child Nutrition: The Achievable Imperative for Global Progress (April) http://www.childinfo.org/files/NutritionReport_April2013_Final.pdf (Accessed November 13, 2017).

Victora, Cesar Gomes, Mercedes de Onis, Pedro Curi Hallal, Monika Blossner, and Roger Shrimpton (2010). Timing of Growth Faltering: Revisiting Implications for Interventions. Pediatrics 125:e473–e480 https://www.researchgate.net/profile/Roger_Shrimpton/publication/41435284_Worldwide_Timing_of_ Growth_Faltering_Revisiting_Implications_for_Interventions/links/54876caa0cf289302e2edb32.pdf (Accessed November 2, 2017).

Victora CG, Adair L, Fall C, et al (2008). Maternal and child undernutrition: Consequences for Adult Health and Human Capital. The Lancet Series; 371: 340–57.

WFP (November 2015). CARI Technical Guidance Note (2nd edition). Consolidated Approach to Reporting Indicators of Food Security (CARI).

World Health Organization (2015). The International Classification of Diseases 11th revision. http://www.who.int/classifications/icd/revision/en/ (accessed December 17, 2017).

WHO (2010). Indicators for assessing infant and young child feeding practices; *Part 2: Measurement*. Geneva, Switzerland.

WHO/UNICEF (2010). 'Joint Monitoring Programme for Water Supply and Sanitation and Drinking Water'; World Health Organization/United Nations Children's Fund: Geneva, Switzerland.

WHO (2014). Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition. World Health Organization. http://apps.who.int/iris/bitstream/10665/113048/1/WHO_NMH_NHD_14.1_eng.pdf (Accessed November 13, 2017)