SMART

NUTRITION SURVEY

DISTRICT LARKANA

Sindh Province

August, 2023

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1. List of Acronyms

AAH	Action Against Hunger Canada
ACF	Action Contre la Faim
ANC	Antenatal Care
CMAM	Community Management of Acute Malnutrition
CDR	Crude Death Rate
CI	Confidence Interval
DEO	Data Entry Operator
EBF	Exclusive Breastfeeding
EPI	Expanded Program on Immunization
GAM	Global Acute Malnutrition
IYCF	Infant and Young Child Feeding
IPC	Infection Prevention and Control
MAD	Minimally Acceptable Diet
MAM	Moderate Acute Malnutrition
MDD	Minimum Dietary Diversity
MIYCF	Maternal & Infant Young Child Feeding
MUAC	Mid-Upper Arm Circumference
NNS	National Nutrition Survey
NGO	Non-Governmental Organization
PLW	Pregnant and Lactating Women
PPS	Probability Proportion to Size
SAM	Severe Acute Malnutrition
SMART	Standardized Monitoring and Assessment of Relief and Transitions
U5DR	Under 5 Death Rate
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation, and Hygiene
WHZ	Weight-for-Height Z-score

2. Executive Summary

The SMART Nutrition Survey of Larkana was conducted in collaboration with UNICEF with the support of Himat consulting under the technical supervision of Actions Against Hunger Canada. The survey aimed to address the lack of nutritional data available for children under five years and Pregnant and Lactating Women (PLWs) in District Larkana. The findings of the survey will be used to scale up interventions, design new programs, identify gaps, and advocate for necessary changes in health and nutrition policy.

The objectives of the SMART survey included measuring the prevalence of wasting and stunting in children aged 6-59 months, assessing the Maternal & Infant Young Child Feeding (MIYCF) practices for children aged 0-23 months, determining the coverage of nutrition services for children under five and PLWs, evaluating food security and livelihood situation, assessing household food consumption, determining the urgency of the situation, and comparing data with previous surveys. Additionally, the survey aimed to determine mortality rates, coverage of child health services, prevalence of diarrhea among children, coverage of antenatal care and iron-folic acid supplementation, access to safe water supply and sanitation facilities, and availability and use of hygiene facilities.

The survey covered both rural and urban populations in the Larkana district, with a two-stage cluster sampling technique applied for sampling and data collection. The sample size was calculated based on parameters related to malnutrition and mortality rates, taking into account the prevalence of Global Acute Malnutrition (GAM) and estimated death rates. The sampling procedure involved the selection of clusters and households using probability proportion to size and systematic random sampling techniques. The division of clusters into smaller segments was done to facilitate the line listing process and ensure timely completion of the survey. In total, 63 clusters were selected for the survey.

Overall, the SMART Nutrition Survey of Larkana aimed to provide comprehensive data on the nutrition and health status of children under five years and PLWs, as well as related factors such as food security, access to healthcare services, and sanitation facilities. The findings will inform targeted interventions and policy changes to improve the nutritional well-being of the population in district Larkana.

Key findings of Nutritional status of Children and mothers

The SMART Nutrition Survey conducted in Larkana, District Larkana in 2023 provides valuable insights into the anthropometry and nutritional status of children, as well as the demographic profile of households in the district. A total of 498 households were successfully surveyed, representing approximately 99.9% of the households visited. In terms of anthropometry, a total of 520 children (266 boys, 240 girls) were assessed for their nutritional status, Z-score for 14 children shows out of range therefore, result is based on 506 children. The prevalence of **Wasting amongst children under 5 years of age-Global Acute Malnutrition (GAM)** based on the

Weight for Height (W/H) Z-score **was found to be 21.1%;** 21.8% in males and 20.4% in females, indicating a medium level of malnutrition based on WHO standards[1].

A total of **15.3% Pregnant and Lactating Women (PLW)** were found to be acutely malnourished in the district which is a determinant of birth outcomes and infant/child nutritional status. Amongst the causal factors the most alarming was the **Minimum Dietary Diversity-Women (MDD-W) were 66.4%** of the PLWs scored medium to low scores on the said indicator. The responses on the **Food Insecurity Experience Scale (FIES)** also depicts the causal routes where **73%** of the respondents experienced moderate and severe hunger.

The key indicator of **Minimum Dietary Diversity for 6–23 months (MDD)** shows that only **13.5%** of the target have access to the standard recommended food groups.

Key findings against the selective indicators for demographic and nutrition status of children of 6-59 months are summarized in the table below:

Table 1: Summary Findings of District Larkana

Indicator	Finding
Demographic	
Total Population (Mid-Interval)	3468.5
Total No. of HHs Assessed	498
% of under five children	18%
Average Number of Persons per Household	7
Nutrition Status of Children 6 – 59 Months	
Global Acute Malnutrition (GAM) WHZ (<-2 z-score and/or oedema)	**21.1 % (17.6 – 25.2 95% CI)**
Male	21.8 % (16.6 – 28.1 95% CI)
Female	20.4 % (16.1 – 25.5 95% CI)
Severe Acute Malnutrition (SAM) WHZ (<-3 z-score and/or oedema)	**5.1 % (3.4 – 7.7 95% CI)**
Male	5.6 % (3.2 – 9.9 95% CI)
Female	4.6 % (2.5 – 8.2 95% CI)
Moderate Acute Malnutrition (MAM) WHZ (<-2 z-score and >=-3 z-score, no oedema)	**16.0 %** (12.6 – 20.2 95% CI)
Male	16.2 % (12.0 – 21.4 95% CI
Female	15.8 % (116 -21.3 95% CI)
Oedema	0.0%
GAM [MUAC] (< 125 mm and/or oedema)	**12.5 %**

[1] [1] WHO Classification of wasting: <2.5%: very low, 2.5 to <5%: low, 5 to <10%: medium, 10 to <15%: high, ≥15%: very high

Indicator	Finding
	(9.5 – 16.2 95% C.I.)
SAM [MUAC] (< 115 mm and/or oedema)	**5.2 %** (3.3 – 8.1 95% C.I.)
MAM [MUAC] (< 125 mm and >= 115 mm, no oedema)	**7.3 %** (5.0 – 10.6 95% C.I.)
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	**24.6 %** (20.6 – 29.1 95% C.I.)
Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	**8.1 %** (5.9 – 10.9 95% C.I.)
Stunting [HAZ] Prevalence of stunting (<-2 z-score)	**40.2 %** (34.7 - 45.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	**26.1 %** (21.6 – 31.2 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	**14.0 %** (10.5 - 18.5 95% C.I.)
Underweight [WAZ] Prevalence of underweight (<-2 z-score)	**27.2 %** (21.6 – 33.6 95% C.I.)

Assessment of Larkana population through SMART Nutrition Survey in August 2023 revealed high rates of malnutrition among children aged 6 to 59 months, with 21.1% affected by Global Acute Malnutrition (GAM) and 5.1% by Severe Acute Malnutrition (SAM). Stunting affected 40.2% of children, and 27.2% were underweight. GAM by MUAC 12.5% (CI 9.5 – 16.2) and SAM by MUAC was 5.2% (CI 3.3- 8.1).

The prevalence of **underweight**[2] among children aged 6-59 months was 27.2%, with severe underweight affecting 9.5% of the children. Both boys and girls were nearly equally at risk of malnutrition (p-value 0.726).

Stunting, an indicator of chronic malnutrition, was found in 40.2% of the surveyed children. Boys had a slightly higher prevalence of stunting compared to girls, although the difference was not statistically significant (p-value. 0.580).

The severity of malnutrition among children aged 6-59 months was classified as "High" for wasting, high for underweight, and very high for stunting.

The overall trend across these surveys shows positive improvements in nutritional indicators for children in Larkana. There's a consistent decline in underweight and stunting rates, indicating potential successes in various health and nutrition programs, community interventions, or socio-economic developments targeting child health.

[2]WHO Classification of Underweight: Low - <10%, Medium – 10-19.9%, High -20-29.9%, Alarming/Critical -> 30%

Table 2 Malnutrition Trends in past 5 years

Larkana		
Indicators	**NNS 2017-18**	**SMART 2023**
Global Acute Malnutrition	22.9%	21.1%
Underweight	42.8%	27.2%
Stunting	49.3%	40.2%

Retrospective Mortality

The provided information includes data on retrospective mortality rates and causes of death within a given population. The Crude Death Rate (CDR), which represents the total number of deaths per 10,000 people, is reported at 0.56% with a confidence interval ranging from (0.32 -0.98).

The Under 5 death rate (U5DR), focusing specifically on deaths of children under the age of five, data provides further details on mortality rates, and was 0.15 in Larkana. The CDR was broken down by sex and age groups. For males, the CDR was reported at 0.70% with a confidence interval of 0.35-1.37; Females have a slightly lower CDR of 0.43%, with a confidence interval of 0.22-0.86. Design effect implies that male ratio is higher in sex specific mortalities in district Larkana compared to females.

The causes of death were categorized into three broad categories: Unknown, Injury/Traumatic, and Illness. The percentage distribution revealed that 8.7% were due to injury or trauma, and 100%, were attributed to illness. Furthermore, the location of death was recorded, with 100% of deaths occurring in the current location.

Overall, the mortality rates, including the Crude Death Rate and Under 5 death rate[3], are below the established public health emergency thresholds, suggesting that the population's mortality and child mortality rates are not of significant concern from a public health standpoint.

Recommendations

- Based on the high rates of malnutrition in Larkana, specific program interventions are recommended. Implementing community-based Therapeutic Feeding Programs (TFP) is essential, focusing on providing ready-to-use therapeutic foods for severe acute malnutrition cases.
- In conjunction, targeted Supplementary Feeding Programs (SFP) should offer nutrient-rich supplements to combat moderate malnutrition and prevent further deterioration.
- Considering the poor child and mother nutrition social safety programs and nutrition sensitive programs should be integrated with nutrition treatment to promote diversified diets, proper feeding practices, and hygiene.

[3] South Asia CDR baseline 0.22, CDR Emergency threshold 00.40), U5DR baseline 0.46, U5DR Emergency threshold (0.90)

- Strengthening healthcare services involves training health workers and community level initiatives like family MUAC for early detection and management of malnutrition.
- Ensuring the availability of essential medicines and therapeutic foods at health facilities.
- Water, Sanitation, and Hygiene (WASH) interventions should improve access to clean water and sanitation facilities, because most of the sources are damaged or the quality of water is not good.
- Ongoing monitoring and evaluation should guide program adjustments, and community engagement initiatives, including support groups and local leaders, can enhance the effectiveness and sustainability of these interventions.
- Robust Campaign at community level is essential to promote health seeking behavior and children/mothers vaccination

3. Introduction

3.1. Larkana – district at the glance

District Larkana lies in 670 56" 20' to 680 29" 34' east longitudes and 270 7" 31' to 270 56" 2' north latitudes[4]. This district is bounded by district Shikarpur and Khairpur on the east, district Jacobabad on the north, district Qambar Shahdadkot and Dadu on the west, and district Naushero Feroz on the south. Larkana has the privilege of being the seat of one of the oldest civilizations of the world, the Indus Valley Civilization. Moen Jo Daro, which means "Mount of Dead", which was one of the largest settlements of the Indus Valley civilization and is designated as UNESCO world heritage, is situated 32 km away from the city of Larkana on the west bank of Indus River[5].

[4] Pakistan Emergency Situation Analysis. https://www.alhasan.com/system/files/skim-magazine/PESA-DP-Larkana-Sindh.pdf

[5] PAKISTAN EMERGENCY SITUATIONAL ANALYSIS August 2014 "Disaster risk reduction has been a part of USAID's work for decades. ……..we strive to do so in ways that better assess the threat of hazards, reduce losses, and ultimately protect and save more people during the next disaster." Kasey Channell, Acting Director of the Disaster Response and Mitigation Division of USAID's Office of U.S. Foreign Disaster Assistance (OFDA) District Larkana. https://reliefweb.int/report/pakistan/pakistan-emergency-situation-analysis-district-larkana-august-2014

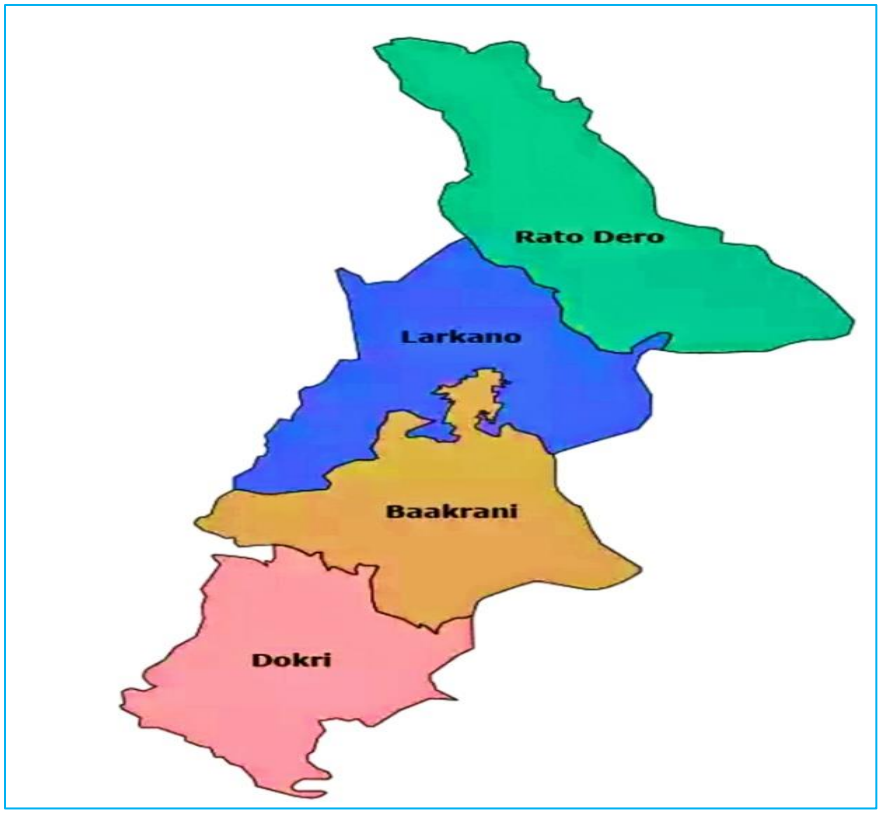

Figure 1: Maps of District Larkana[6]

3.2. Demography and Population

At the time of the 2017 census, the district had a population of 1521464, of which 775934 are males and 745530 females. The largest share of the population is of 5–9 year age group, accounting for over half a million.[4]Larkana is primarily populated by Sindhi, who comprise the second-largest ethnic group in the country. People of this district are pre-dominantly Sindhi speaking but Urdu, Balochi and Brohi are also spoken in the district. Bhutto, Rind, Bhugio, Sheikh, Unnar, Chandio, Magsi, Soomro, Memon and Kalhoro are the major clans of this district. Islam is the religion of majority in this district followed by a minority of Hindu community[7].

3.3. Economy & Livelihoods

Agriculture sector is the dominant employer for the population of this district. The Agriculture Census 2000 classifies rural households under three broad categories: agricultural households that operate land as owner-cultivators or tenants; livestock owners; and non-agricultural

[6]https://www.politicpk.com/Larkana-district-uc-ward-list-mna-mpa-seats
[7] https://www.pbs.gov.pk/sites/default/files/population/2017/results/07811.pdf

households. In district Larkana, the share of non-agricultural households in total rural households is 35.9% percent, while agricultural households and livestock owners constitute 35.2% percent and 28.9% percent respectively[8]

3.4. Survey Justification

The National Nutrition Survey NNS 2017-18 (15.0%) Global Acute Malnutrition (GAM) prevalence of under 5 year children of district Larkana. There was a high risk of further deterioration of health and nutrition status, access and availability of nutrition services due to potential impact of food insecurity and malnutrition. However, there was a lack of nutritional data available for children under five years and Pregnant and lactating women (PLWs). The Department of Health, District Larkana, decided to conduct a SMART Nutrition Survey in collaboration with UNICEF and with support of Himat Consulting under the technical supervision of Action Against Hunger (AAH) Canada

The survey findings will be used to scale up the intervention, initiation of new program design, identification of gaps and advocate for any necessary changes in health and nutrition policy. During Survey Implementation necessary technical guidelines recommended by UNICEF, Nutrition Directorate and Action Against Hunger Technical Advisor were followed.

3.5. Survey Objectives

The purpose of the current assignment was to design and conduct a survey in the selected districts of Sindh, and contribute to the ongoing interventions on strengthening the nutrition information system, early warning as well as disaster risk reduction. A district-level SMART survey was an extension of the recently conducted NNS 2018, which provides first-ever district-level nutrition and food security data.

The objectives of the SMART surveys were following:

1) To measure the prevalence of wasting and stunting in children aged 6-59 months and wasting among pregnant and lactating women (PLW).
2) To assess the MIYCF practices for children aged 0-23 months
3) To determine the coverage of preventive and curative nutrition services for children under five years of age, and pregnant and lactating women (PLW)
4) To determine the food security and livelihood situation in in proposed districts
5) To assess household food consumption (quantity and quality).
6) To assess the urgency of the situation and how it may evolve in the future by comparing data with previous surveys.

8 Arif, et al (2010), “The 2010 Flood and Poverty in Pakistan: A Preliminary District-level Analysis”, Pakistan Institute of Development Economics Islamabad, Background Paper for Conference on the " The Environments of the Poor”, 24-26 Nov. 2010, New Delhi

Health

1) To determine retrospective crude mortality rate (CMR) and under five mortality rates (U5MR).
2) To determine the coverage of child health services (Immunization/measles vaccination, vitamin A supplementation, common childhood illness and deworming.
3) Prevalence of diarrhea among children aged 6-59 months, and determine use of oral rehydration salt (ORS) and/or zinc during diarrhea episodes in children aged 6-59 months
4) To determine enrolment into antenatal care and coverage of iron-folic acid supplementation in pregnant women

WASH

1) To determine the population's access to, and use of safe water supply including distance to facility and quality of water
2) To determine the population's access to sanitation facilities including issues of safety and privacy of the facilities
3) To determine the population's access to hygiene facilities and availability and use of soap.

3.6. Survey Area

The study area of the Larkana district included both rural and urban population; 54.07% rural and 46.93% urban[9]. Village-wise population data was collected from the Expanded Program on immunization EPI for cluster identification using ENA software (version 11th Jan 2020).

4. Methodology

4.1. Type of Survey

A population-representative cross-sectional household survey following the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology was designed. Two-stage cluster sampling technique was applied for sampling (identification of clusters/households) and data collection. During implementation of survey Infection Prevention and Control (IPC) measures were being followed.

4.2. Sample size calculation

The sample size was designed to achieve reasonable precision for estimating acute malnutrition as well as mortality separately. All calculations were made using ENA for SMART software

[9] https://www.pbs.gov.pk/census-2017-district-wise/results/078

(version Jan 11th 2020). The parameters and rationale considered for sample size calculations in two different contexts: anthropometry (related to malnutrition) and mortality rates.

For the anthropometric parameters, the prevalence of Global Acute Malnutrition (GAM) in Larkana is estimated at 13.9% (MICS). The desired precision set at 5, and 1.5 design effect used to account for heterogeneity in nutritional status within district. The sample size for children aged 6-59 is calculated to be 443, and the average household size is determined to be 7. Additionally, the percentage of the population represented by children under 5 is 14.8%, and a non-response rate of 3% was anticipated.

For the mortality parameters, the estimated death rate was 0.30 (0.15 – 0.56 95% CI) deaths per 10,000 populations per day, and a design effect of 1.5 was applied based on SMART recommendations for cluster sampling. The recall period for mortality data collection was 118 days, with a memorable recall event considered to be the 1st May (Labor Day). The sample size for the population was calculated to be 190,408,7[10], and the average household size was 7. The anticipated non-response rate was 3%, resulting in a calculated number of individuals (1772) and households (261) to be included in the sample. These parameters and rationale were crucial for determining appropriate sample sizes, ensuring accurate representation and precision in the collected data. They provided a foundation for conducting studies and assessments related to anthropometry and mortality rates. (See Table 2 below):

Table 3: Parameters and rationale

Anthro / Mortality Parameters	Updated parameters	Rationale
Estimate Prevalence	22.9	Multiple Indicator Cluster Survey 2018-19
Desired Precision	5	As per SMART Manual Suggested
Design Effect	1.5	A design effect of 1.5 was used. This is based on the assumption that there is some level of heterogeneity in the nutritional status within the districts.
Sample Size (Children 6-59)	443	Calculated by ENA software
Average HH Size	7	Based on Census Data 2017
% of U5s	14.8	Population Census Pakistan-2017 district tables
% of NRR	3	Non-response
Household to be included	**379**	**Calculated by ENA software**
Sample Size (HH to be included)	490	Calculated by ENA software
Estimate death rate	0.30	Taken from country level Mortality rate (6.736) 2023 and divided in 10,000/day
Desired Precision	0.3	+- desired precision per 10,000/day
Design Effect	1.5	As per SMART recommendation for Cluster Sampling
Recall Period in days	118	1st May (Labor Day)

[10] Updated Population (District EPI Program)

Anthro / Mortality Parameters	Updated parameters	Rationale
Average HH Size	7	Based on Census Data 2017
% of NRR	3	Anticipated non response rate
Population to be included	1772	Calculated by ENA software
Household to be included	261	Calculated by ENA software
Total Clusters	45	10 HHs per team per day

*Recall period has to be adjusted during analysis based on the actual survey data collection period and therefore, there might be slightly differ from the initial protocol assumed recall period.

4.3. Selection of Clusters and households

Two stage sampling procedure was applied to conduct the SMART survey. In the ***first stage***, a cluster or a primary sampling unit (PSU) was selected. A list of villages/clusters with updated population was used to select the sample of clusters by uploading the list in ENA (version Jan, 11 2020) software. In the ***second stage*** basic sampling unit (BSU) comprising of households present in the sampled cluster were mapped and line listed. The selection of households was then done through a systematic random sampling technique.

In some cases, villages/clusters population was large in size or widely dispersed or scattered, making it difficult for the team to perform line listing and complete the target on time. In order to achieve the target and reduce burden of line listing, segmentation process was followed. In this process, village population was divided into smaller (min 50 and max 150HH) equal or unequal segments, based on existing structures (block, sub-blocks, mosque, temples, river, canals, & rail line) and one segment was randomly selected. The selection of segment to represent the cluster was done through application of Probability Proportion to Size (PPS) methodology based on the population size of the households. The clusters were distributed to allow each team to complete one cluster per day.

During the preliminary household listing and observatory visits, it was evident that not all mothers could partake in the survey throughout the day due to their work commitments. However, by scheduling survey team visits between 07:00 AM to 01:00 PM and again from 03:00 PM to 07:00 PM, it was observed that a majority of mothers could participate. To accommodate this, the data collection plan and office hours were adjusted, allowing for a longer break during lunch. It's important to note that stringent security procedures were implemented during the survey.

Each team calculated the number of households they could survey per cluster per day at various locations, considering travel time and the time required to select and survey households. They found that each team could feasibly visit and complete questionnaires for 11 households per day in each cluster.

Table 4 Calculation of HH coverage/day/team

Calculation of HH coverage/day/team		
Event/Activity	Time to dedicate	Total time remaining
Time per day for field work including lunch and refreshment/prayer break	7:00 -19:00=720 min	720 min
Travel time (including travel time, round trip)	60 min X 2 trip =120 min	720-120=600min
Lunch and prayer break	13:00-15:00= 120 min	600-120= 480 min
Average time allocated for households' interview by one interviewer (Interview + Travel time between household	35 min+ 5 min= 40 min	All indicators may not require to collect from all households except demo, food security and WASH. For instance, almost two third of slum's households have no child meaning that team need less time for these households. For the household having children, measurer assistant will move to the next households after completing measurement in previous HH.
Total number of HH's to be covered by each team per day (with one interviewers)	480 min/45 min per HH=10.6 households ≡ 11 Households	
Total number of HH's to be covered by each team per day (with two interviewers)	11 households*6 teams= 66 households	

An average of 66 households per day, 66 respondents was interviewed, totaling approximately 45 clusters. This goal of 498 households was achieved within the allotted 07-day timeframe. Clusters and backup clusters were allocated using ENA software. The reserve clusters (RC) would only be activated if more than 10% of the planned clusters couldn't be included for any reason.

In Larkana, a robust methodology was employed, involving 45 clusters and six data collection teams. Each team was assigned to cover one cluster per day, ensuring a systematic and comprehensive survey of the entire population. This approach allowed for a detailed examination of malnutrition rates among children aged 6 to 59 months on a daily basis. The division of clusters among multiple teams facilitated efficient and timely data collection, contributing to the accuracy and reliability of the findings. This methodology not only ensured the thorough coverage of the targeted age group but also enabled a focused and concentrated effort in each cluster, enhancing the overall quality of the SMART Nutrition Survey in August 2023.

4.4. Training of Field Data Collection Teams

The training was conducted in Larkana for 6 data collection teams, each consisting of a supervisor and two data collectors. The training content covered various modules, including household information, mothers/care-takers data, child nutrition and immunization status, and child's current health. The implementation modalities and ethical considerations were also discussed.

Figure 2: Mr. Muhammad Ali, Regional Advisor to AAH, explaining processes and procedures (joint training of Qambar Shahdadkot and Larkana)

The training was conducted over six days, and included theoretical and practical components. The training was delivered by a team of professionals, including SMART experts, and public health consultants.

Pre and post-tests were conducted to assess participants' knowledge gain, and a standardization test was performed to evaluate their anthropometric measurement skills. The results of the pre and post-tests showed a significant improvement in knowledge among participants. The Larkana team collectively obtained 157/315 (49.8%) marks in the pre-test, while in post-test they scored 235/315 (74.6%) marks, showing an overall improvement of 30%. The capacity enhancement of participants anthropometric measurement skills was also assessed through standardization tests on training day 4 and 6. Overall, the training program successfully built the capacity of the field teams to collect quality data. With the completion of the training and standardization exercises, the teams proceeded for data collection in the field.

4.5. List of indicators

Bilateral Pitting Oedema: was assessed by applying a moderate thumb pressure on BOTH feet for three seconds. If oedema is present, a shallow pit will remain after releasing pressure from the feet. Only children with bilateral oedema (oedema on both feet) are diagnosed positive for nutritional Oedema. Supervisor confirmed all cases of oedema. However, no oedema case found during the assessment h)

Crude mortality rate (CDR): One of the primary goals of humanitarian response to a humanitarian crisis is the prevention and reduction of mortality. The CDR is a metric frequently used to gauge the severity of a humanitarian crisis. It is defined as the number of deaths from all causes per 10,000 people per day over a specified period of time. It is calculated from the following formula:

CDR = Number of deaths / (mid-interval population / 10,000) x time interval = deaths / 10,000 / day

Under five death rates (U5DR): U5DR is defined as the number of deaths among children under five from all causes per 10,000 people per day over a specific period of time. It is calculated from the following formula:

U5DR = Number of under 5 deaths / (mid-interval population / 10,000) x time interval = under 5 deaths / 10,000 / day j) Diarrhea was assessed through two weeks recall period. Diarrhea is defined as passage of three or more loose or liquid stools in a day in children aged 6-59 months. k)

Use of ORS/zinc during a diarrhea episode: The interviewer was asked the mother/caregiver of the child if he/she received ORS sachets and/or zinc during a diarrhea episode. An ORS sachet and a zinc pill were shown when asked to recall.

Measles vaccination in children 9-59 months: Measles vaccination were assessed among children aged 9-59 months by checking for the measles vaccine on the EPI card if available or by asking the caregiver to recall if no EPI card is available.

Vitamin A Supplementation in children 6-59 months: Vitamin A supplementation was assessed among children aged 6-59 months by checking the EPI card if available or by asking the caregiver to recall if no EPI card is available.

Case definitions Infant and Young Child Feeding practices: Only few important IYCF indicators were used to calculate them are detailed below.

Exclusively breastfed for the first two days after birth: Percentage of children born in the last 23 months who were fed exclusively with breast milk for the first two days after birth Children born in the last 24 months who were fed exclusively with breast milk for the first two days after birth Children born in the last 24 months

Early Initiation of breastfeeding: Proportion of children born in the last 24 months who were breastfed within one hour of birth. Children born in the last 24 months who were put to the breast within one hour after birth Children born in the last 24 months

Exclusive breastfeeding under 6 months: Percentage of infants 0–5 months of age who were fed exclusively with breast milk during the previous day Infants 0-5 months of age who received only breast milk during the previous day Infants 0-5 months of age

Bottle feeding: Proportion of children 0–23 months of age who are fed with a bottle. Children 0–23 months of age who were fed with a bottle during the previous day Children 0–23 months of age

Minimum dietary diversity: Percentage of children 6–23 months of age who consumed foods and beverages from at least five out of eight defined food groups during the previous day. The eight food groups used for tabulation of this indicator are:

1. Breast milk
2. Grains, roots, tubers and plantains
3. Pulses (beans, peas, lentils), nuts and seeds
4. Dairy products (milk, infant formula, yogurt, cheese)
5. Flesh foods (meat, fish, poultry, organ meats)
6. Eggs
7. Vitamin-A rich fruits and vegetables
8. Other fruits and vegetables

Minimum meal frequency: Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more.

- Minimum meal frequency for non-breastfed children [6-23 months] [>=4 full meals]
- Minimum meal frequency for breastfed children [6-8 months] [>=2 full meals]
- Minimum meal frequency for breastfed children [9-23 months] [>=3 full meals]

Minimum acceptable diet: Percentage of children 6–23 months of age who consumed a minimum acceptable diet during the previous day

4.6. Data analysis and review process

To ensure data accuracy and precision, the data collected from the field was consistently reviewed on a daily basis and at multiple levels.

At the field level, anthropometry, mortality, and data submitted in cluster control forms in hard form were reviewed by the monitors before data entry by the DEOs, to clean any logical errors. The plausibility analysis was then run by a SMART Nutrition expert using ENA software and

shared with the AAH Regional Advisor for review and endorsement. The result of the plausibility analysis was shared with AAH on a daily basis before teams proceeded to the next clusters.

Feedback was provided to the monitors for correction of errors identified through field verification after revisits. The process of data collection and data output was also reviewed several times during the field activities by the joint monitoring team of UNICEF, AAH, and Himat Consulting for taking necessary actions to ensure data quality.

4.7. Standardization Test

Based on satisfactory performance of data collectors recruited in district Larkana for SMART Nutrition survey were taken onboard in district Larkana. Training on anthropometric techniques and basic concepts of the SMART survey were delivered by SMART experts.

4.8. Monitoring and Supportive Supervision

UNICEF Sindh Provincial Nutrition team, ensured the quality of data collection processes with support of UNICEF Head Office, AAH and Himat Consulting through closed and continued monitoring and supportive supervision. Stakeholders discussed observations made during the monitoring visits and provided feedback to the teams to further improve data collection process. Following are glimpses of training and field activities relating to SMART Nutrition Survey in Larkana district.

Figure 3 Teams taking anthropometric measurements during the training and in the field (joint training of Qambar Shahdadkot and Larkana)

5. Survey Findings

5.1. Household Characteristics and Demographic Profile

SMART Nutrition Survey in Larkana covered a total of 498 households. All of these households were successfully surveyed, which accounts for approximately 100% of the total households visited.

Table 5: Achieved Sample Size of the SMART Survey in Larkana

Overall Sample size achievement					
Clusters achievement			**# of children recorded**		
Clusters achieved	Households achieved	Children achieved	Children 0-59 months	Children 6-59 months	Children 0-23 months
100%	99.9%	117.3%	556	520	244

5.2. Nutritional status of children 6-59 months

The overall plausibility score of districts Larkana was 8% which positively implies the quality of the survey under excellent category. Children were weighed removing of all clothes to the nearest 100g (0.1 kg) by using a SECA electronic scale. The children who can easily stand are asked to stand on the weighing scale and their weight is recorded. In a situation when the children cannot stand, the double weighing method is applied. The prevalence of Global Acute Malnutrition (GAM) in District Larkana based on weight for height z-score/and or oedema was 21.1% (17.6 - 25.2 95% C.I), and the prevalence of Severe Acute Malnutrition (SAM) was 5.1 % (3.4 - 7.7 95% C.I.). The overall GAM[11] prevalence is indicative of high malnutrition based on the WHO standards. Analysis of gender shows no significant difference of malnutrition among both groups (p-value: <0.705), both are at equal risk of malnutrition with the prevalence of 21.8 % (16.6 – 28.1 95% C.I.), and 20.4% (16.1 – 25.5 95% C.I.) respectively.

Table 6: Prevalence of acute malnutrition based on (Wasting) weight-for-height z-scores (and/or oedema) and by Boys vs Girls

Indicators	All n = 506	Boys n = 266	Girls n = 240	P value
Prevalence of global malnutrition **(<-2 z-score and/or oedema)**	(107) 21.1 % (17.6 - 25.2 95% C.I.)	(58) 21.8 % (16.6 - 28.1 95% C.I.)	(49) 20.4 % (16.1 - 25.5 95% C.I.)	0.705
Prevalence of moderate malnutrition **(<-2 z-score and >=-3 z-score, no oedema)**	(81) 16.0 % (12.6 - 20.2 95% C.I.)	(43) 16.2 % (12.0 - 21.4 95% C.I.)	(38) 15.8 % (11.6 - 21.3 95% C.I.)	0.905
Prevalence of severe malnutrition	(26) 5.1 %	(15) 5.6 %	(11) 4.6 %	0.629

[11] WHO/UNICEF Cut Off Points wasting using Z-Score (-2 Z scores in populations: <2.5% - very low;2.5-<5%, -Low; 5<10% - Medium;10<15% -High;>15%-very High)

(<-3 z-score and/or oedema)	(3.4 - 7.7 95% C.I.)	(3.2 - 9.9 95% C.I.)	(2.5 - 8.2 95% C.I.)	

The prevalence of oedema is 0.0 %

5.3. Prevalence of acute malnutrition by age, based on WHZ scores and/or oedema

Prevalence of acute malnutrition by age, based on weight-for-height z-scores data shows that severe wasting was more prevalent in 6-23 months children than other age groups, similarly moderate wasting was most commonly prevalent in the same age group.

Table 7: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age	No	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-23	203	21	10.3	42	20.7	140	69.0	0	0.0
24-29	44	2	4.5	5	11.4	37	84.1	0	0.0
30-41	118	2	1.7	12	10.2	104	88.1	0	0.0
42-53	103	0	0.0	12	11.7	91	88.3	0	0.0
54-59	38	1	2.6	10	26.3	27	71.1	0	0.0
Total	506	26	5.1	81	16.0	399	78.9	0	0.0

The table given below presents the distribution of acute malnutrition and oedema, on the basis of weight-for-height z-scores. None of the surveyed children had oedema.

Table 8: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

indicator	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 31	Not severely malnourished. 489 (94.0 %)

	(6.0 %)	

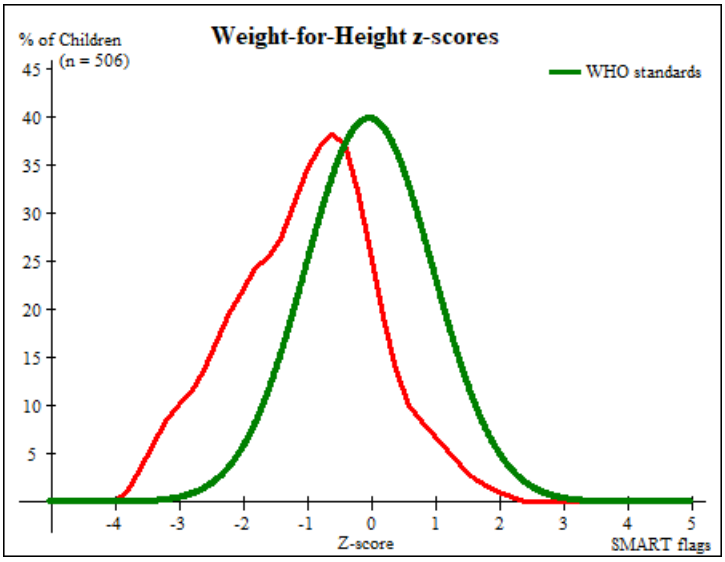

Figure 4: Gaussian Curve Weight-for-Height z score

The above figure shows the comparison of nutrition status of the 6 to 59 months in district Larkana and the reference population. The green curve represents the reference population while the red curve represents the surveyed population. The figure shows a significant shift to the left for the reference population which implies that malnourished children are more in surveyed population as compared to reference population.

5.4. Prevalence of acute malnutrition (Wasting) by Boys vs Girls based on MUAC cut offs (and/or oedema)

MUAC can be used as a proxy indicator of wasting and it is also found to be the good indicator for death. MUAC (<11.5 cm for children 6-59 months), is considered a high mortality risk and is a criterion for admission of outpatient therapeutic or patients treated for severe acute malnutrition. A MUAC reading of 11.5 cm to <12.5 cm is considered as moderate acute malnutrition. As shown in the table below, prevalence of Global malnutrition was 12.5%. The prevalence was slightly higher among girls (13.4%), as compared to boys (11.7%); however, this difference was not statistically significant (p value 0.575). The prevalence of Severe malnutrition was 5.2%.

Table 9: Prevalence of Acute Malnutrition (Wasting) by Boys vs Girls Based on MUAC cut offs (and/or oedema)

Indicators	All n = 520	Boys n = 273	Girls n = 247	P value
Prevalence of global malnutrition **(< 125 mm and/or oedema)**	(65) 12.5 % (9.5 - 16.2 95% C.I.)	(32) 11.7 % (7.9 - 17.0 95% C.I.)	(33) 13.4 % (9.8 - 18.0 95% C.I.)	0.575
Prevalence of moderate malnutrition **(< 125 mm and >= 115 mm, no oedema)**	(38) 7.3 % (5.0 - 10.6 95% C.I.)	(18) 6.6 % (3.8 - 11.2 95% C.I.)	(20) 8.1 % (5.3 - 12.2 95% C.I.)	0.541
Prevalence of severe malnutrition **(< 115 mm and/or oedema)**	(27) 5.2 % (3.3 - 8.1 95% C.I.)	(14) 5.1 % (2.8 - 9.3 95% C.I.)	(13) 5.3 % (3.1 - 8.8 95% C.I.)	0.922

The data shows considerable difference between GAM prevalence identified through WHZ (21.1%) as opposed to 12.5% based on MUAC measurements. This implies a significant impact on the actual number of prevailing cases in the community which is 21.1% Vs the admission criteria of CMAM programmes which considers MUAC only. The current comparison in Larkana also shows that the SAM identified through both criterions are almost same approximately 5% while the major difference lies in the MAM where 7.3% children were identified as MAM under the MUAC criteria while 16% through the WHZ. Hence there is a need to probe these dynamics further and contextualize the recommendations for future programs as there is a high risk of missing out MAM and SAM children through a single admission criterion.

5.5. Prevalence of acute malnutrition by age groups, based on MUAC cut off and/or oedema

Further analysis was performed based on prevalence of acute malnutrition by MUAC based on age as indicated in Table 10. Children in age groups 6-23 months, and 30-41 months were more affected by wasting than children 42-59 months and the reason could be in appropriate feeding practices and food insecurity. Moderate wasting was also seen most commonly in the 6-17 months age group.

Table 10: Prevalence of acute malnutrition by age groups, based on MUAC cut off 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.**	**%**
6-23	208	23	11.1	30	14.4	155	74.5	0	0.0
24-29	46	1	2.2	0	0.0	45	97.8	0	0.0
30-41	123	3	2.4	3	2.4	117	95.1	0	0.0
42-53	103	0	0.0	2	1.9	101	98.1	0	0.0
54-59	40	0	0.0	3	7.5	37	92.5	0	0.0
Total	520	27	5.2	38	7.3	455	87.5	0	0.0

5.6. Prevalence of combined GAM and SAM based on WHZ and MUAC cut offs

The table below presents the prevalence of combined Global Acute Malnutrition (GAM) 24.6 % (20.6 – 2.1 95% C.I.), and Severe Acute Malnutrition (SAM) 8.1 % (5.9 – 10.9 95% C.I.) based on different anthropometric indicators, namely Weight-for-Height Z-score (WHZ) and Mid-Upper Arm Circumference (MUAC) cut-offs, as well as the presence of edema. The data is categorized by gender, with the total number of participants (n) being 668, out of which 273 are boys and 247 are girls.

The data shows the proportion of children experiencing both GAM and SAM based on the defined anthropometric criteria. It appears that the prevalence of GAM and SAM is slightly higher among boys compared to girls, but the difference is not statistically significant as indicated by the P-values (0.462 and 0.770).

Table 11: Prevalence of combined GAM and SAM based on WHZ and MUAC cut offs (Boys vs Girls)

	All n = 520	Boys n = 273	Girls n = 247	P value
Prevalence of combined GAM **(WHZ <-2 and/or MUAC < 125 mm and/or oedema)**	(128) 24.6 % (20.6 - 29.1 95% C.I.)	(71) 26.0 % (20.1 - 33.0 95% C.I.)	(57) 23.1 % (18.8 - 28.0 95% C.I.)	0.462
Prevalence of combined SAM **(WHZ < -3 and/or MUAC < 115 mm and/or oedema**	(42) 8.1 % (5.9 - 10.9 95% C.I.)	(23) 8.4 % (5.4 - 12.8 95% C.I.)	(19) 7.7 % (5.1 - 11.5 95% C.I.)	0.770

*With SMART or WHO flags a missing MUAC/WHZ or not plausible WHZ value is considered as normal when the other value is available

The table given below presents details of children having GAM and SAM, with respect to the criteria for GAM and SAM, like MUAC value and weight for height.

Table 12: Distribution of children according to criteria for combined GAM and SAM

	GAM		SAM	
	no.	**%**	**no.**	**%**
MUAC	21	4.0	16	3.1
WHZ	63	12.1	15	2.9
Both	44	8.5	11	2.1
Edema	0	0.0	0	0.0
Total	128	24.6	42	8.1

5.7. Prevalence of underweight based on weight-for-age z-scores by sex

Underweight is defined as low weight for age relative to NCHS and WHO reference median. Children with weight for age less than -2 SD in relation to a reference child are classified as underweight while those with less than -3 SD are classified as severe underweight. The prevalence of underweight among children under 6 to 59 months in district Larkana was 27.2% (21.6 – 33.6 95% C.I.), while those who were severely underweight was 9.5% (6.7 – 13.4 95% C.I.). Analysis by sex shows no significant difference in boys and girls ($p < 0.308$); both genders are at equal risk of malnutrition with prevalence of 29.5% (22.9 – 37.1 95% C.I.), and 24.6% (18.7 – 31.7 95% C.I.) respectively.

Table 13: Prevalence of underweight based on weight-for-age z-scores by Boys vs Girls

	All n = 515	Boys n = 271	Girls n = 244	P value
Prevalence of underweight **(<-2 z-score)**	(140) 27.2 % (21.6 - 33.6 95% C.I.)	(80) 29.5 % (22.9 - 37.1 95% C.I.)	(60) 24.6 % (18.7 - 31.7 95% C.I.)	0.308
Prevalence of moderate underweight **(<-2 z-score and >=-3 z-score)**	(91) 17.7 % (13.4 - 22.9 95% C.I.)	(53) 19.6 % (14.5 - 25.8 95% C.I.)	(38) 15.6 % (10.9 - 21.7 95% C.I.)	0.310
Prevalence of severe underweight **(<-3 z-score)**	(49) 9.5 % (6.7 - 13.4 95% C.I.)	(27) 10.0 % (6.5 - 14.9 95% C.I.)	(22) 9.0 % (5.8 - 13.8 95% C.I.)	0.726

The table given below presents the prevalence of underweight by age, based on weight for age z-scores. As shown in Table 14, the highest proportion of severe underweight children was in age group 24-29 months (13.0%), followed by 11.3% in 6-23 months age group. For moderate underweight, the highest proportion of children was in age group 54-59 months (32.5%).

Table 14: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-23	204	23	11.3	45	22.1	136	66.7	0	0.0
24-29	46	6	13.0	5	10.9	35	76.1	0	0.0
30-41	122	10	8.2	14	11.5	98	80.3	0	0.0
42-53	103	7	6.8	14	13.6	82	79.6	0	0.0
54-59	40	3	7.5	13	32.5	24	60.0	0	0.0
Total	515	49	9.5	91	17.7	375	72.8	0	0.0

5.8. Prevalence of stunting based on height-for-age z-scores by sex

Stunting is an indicator of chronic (long-term) malnutrition which is mainly due to long term food deprivation, deficiency of micronutrients, recurrent illness and other socio-economic factors that affect normal growth. WHO defines height-for-age less than -2 SD from median height age reference population. Inadequate infant young child feeding and maternal under nutrition results in childhood stunting. Stunting is associated with impaired neurocognitive development, a risk maker of non-communicable diseases and reduced productivity later in life. Height for age z-score was 40.2 % (34.7 – 45.9 95% C.I.); findings suggested that this rate classified as very high[12].Stunting was higher among boys 41.4% (34.9 – 48.2 95% C.I.) than girls 38.8% (32.4 – 45.6 95% C.I.). However, the p-value 0.580 shows that difference was not statistically significant.

Table 15: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 513	Boys n = 268	Girls n = 245	P value
Prevalence of stunting **(<-2 z-score)**	(206) 40.2 % (34.7 - 45.9 95% C.I.)	(111) 41.4 % (34.9 - 48.2 95% C.I.)	(95) 38.8 % (32.4 - 45.6 95% C.I.)	0.580
Prevalence of moderate stunting **(<-2 z-score and >=-3 z-score)**	(134) 26.1 % (21.6 - 31.2 95% C.I.)	(71) 26.5 % (20.8 - 33.0 95% C.I.)	(63) 25.7 % (20.0 - 32.4 95% C.I.)	0.854
Prevalence of severe stunting **(<-3 z-score)**	(72) 14.0 % (10.5 - 18.5 95% C.I.)	(40) 14.9 % (10.3 - 21.1 95% C.I.)	(32) 13.1 % (9.2 - 18.3 95% C.I.)	0.606

The table given below presents the prevalence of stunting by age, based on height for age z-scores. As shown in Table 16, the highest proportion of severe stunting was in 24-29 months old children (26.1%), followed by 26.1% in 54-59 months age group. For moderate stunting, the highest proportion of children was in age group 54-59 months (32.5%).

[12]WHO/UNICEF Cut Off Points for stunting using Z-Score (-2 Z scores in populations:<2.5% - Very low; 2.5-<10% - Low; 10-<20% - Medium; 20- <30% - High; >30% - Very High)

Table 16: 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.**	**%**
6-23	204	24	11.8	45	22.1	135	66.2
24-29	46	12	26.1	13	28.3	21	45.7
30-41	123	17	13.8	35	28.5	71	57.7
42-53	100	11	11.0	28	28.0	61	61.0
54-59	40	8	20.0	13	32.5	19	47.5
Total	513	72	14.0	134	26.1	307	59.8

The table below presents data related to z-scores, design effects, and excluded subjects for three different indicators: Weight-for-Height, Weight-for-Age, and Height-for-Age. Z-scores are measures of how far a child's anthropometric measurement deviates from the standard reference population, with z-scores less than -2 indicating malnutrition. The z-scores for Weight-for-Height (WHZ) and Weight-for-Age (WAZ) were not available for children with edema, which could be due to the difficulty in accurately measuring weight and height in such cases.

The mean z-scores provide an overview of the nutritional status of the subjects, with negative values indicating that, on average, the children in the study have lower measurements compared to the standard reference population. Overall, the data highlights the prevalence of malnutrition among the subjects and emphasizes the importance of monitoring and addressing nutritional status in this population.

Table 17: 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	506	-1.01±1.09	1.08	0	14
Weight-for-Age	515	-1.59±1.06	2.32	0	5
Height-for-Age	513	-1.65±1.19	1.66	0	7

* Contains for WHZ and WAZ the children with edema

5.9. Prevalence of overweight based on WHZ and by sex (no oedema)

Overweight or obesity defined as weight-for-height Z score >+2SD from the median according to WHO Growth Reference Standards 2006. Findings show that the prevalence was 0.00%. Results also imply that severe overweight findings were not found in any of the group.

Table 18: Prevalence of overweight based on WHZ and by sex (no oedema)

	All n = 506	Boys n = 266	Girls n = 240
Prevalence of overweight (WHZ > 2)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

5.10. Severity of malnutrition among children aged 6-59 months

The survey provides information on the severity of malnutrition among children aged 6-59 months, based on the WHO/UNICEF classification from 2018. The findings reveal a worrisome situation regarding malnutrition among children aged 6-59 months. The prevalence of wasting and stunting falls under very high category, and underweight is high.

Table 19: Severity of malnutrition among children aged 6-59 months

Indicators	Prevalence	Severity
Wasting [WHZ]	21.1%	**Very High**
Overweight [WHZ]	0.0%	**Very low**
Stunting [HAZ]	40.2%	**Very High**
Underweight [WAZ]	27.2%	*** High**

The Findings of survey are explained as under:

Wasting: Findings indicate that a sizeable proportion of children in this age group suffer from wasting, which refers to a low weight-for-height ratio. The prevalence of 21.1% suggests a concerning level of malnutrition in terms of wasting considered High[13]. Also, the prevalence of combined Global Acute Malnutrition (GAM), encompassing indicators such as WHZ <-2, MUAC < 125 mm, and/or edema, is alarming.

Over Weight: According to the data, there were no cases of overweight children in this age group. This finding suggests that the prevalence of overweight is extremely low among children aged 6-59 months.

Stunting: The data indicates that a considerable percentage (40.2%) of children suffer from stunting. Stunting refers to a low height-for-age ratio and reflects chronic malnutrition. The high prevalence suggests a concerning level of stunting among children in this age group considered very high[14].

Underweight: The prevalence of underweight children is 27.2%, indicating a high level of under nutrition in terms of weight-for-age. The severity is categorized as "high," which needs to be addressed, considered high[15]

Combined GAM and SAM based on WHZ score and MUAC data;

Data shows that prevalence of wasting based on MUAC tool and WHZ score show high number of cases reported in data. The GAM prevalence was 24.6% recorded and SAM prevalence was 8.1% still under low to medium level category.

These findings underscore the need for interventions and policies aimed at addressing malnutrition and improving the nutritional status of children in this age group.

[13] WHO/UNICEF Cut Off Points wasting using Z-Score (-2 Z scores in populations: <2.5% - very low;2.5-<5%, - Low; 5<10% - Medium;10<15% -High;>15%-very High)

[14] WHO/UNICEF Classification of stunting: <2.5%: very low, 2.5 to <10%: low, 10 to <20%: medium, 20 to <30%: high, ≥30%: very high

[15] WHO Classification of Underweight: Low - <10%, Medium – 10-19.9%, High -20-29.9%, Alarming/Critical -> 30%

5.11. Retrospective Mortality

Based on the information collected, the overall Crude Death Rate (CDR) is 0.56%, with a range of CI 0.32 – 0.98%. This means that out of the total population, a small percentage of people have died within a given period. The CDR is a measure of the total number of deaths in a population, usually expressed per 1,000 or 10,000 people.

In comparison, the Under 5 death rate (U5DR) is lower at 0.70% death/10,000/day. The U5DR specifically focuses on deaths of children under the age of five. This rate indicates the number of deaths among children under five years old per 10,000 children per day.

It is mentioned that both the CDR (0.56) and U5DR (0.15) are well below the public health emergency thresholds of 1 and 2 deaths/10,000/day, respectively. These thresholds serve as indicators to monitor the severity of a public health situation. In this case, the death rates are below the thresholds, suggesting that the overall mortality and child mortality rates are not alarming from a public health perspective[16]. Household level questions were asked to determine the cause of each death, under the broad categories of illness or injury/trauma. Majority of the deaths (91.3%) were caused by illness; while injury/trauma accounted for the remaining 8.7% deaths. Data shows that 100% deaths occurred in current location.

Table 20: Retrospective Mortality

	Crude Death Rate (95% CI)	Design Effect	
Overall	**0.56 (0.32-0.98)**	**1.79**	
Sex			
Male	**0.70 (0.35-1.37)**	**1.61**	
Female	**0.43 (0.22-0.86)**	**1.05**	
Years			
Under 5 Children (0-4 years)	**0.15 (0.02-1.12)**	**1**	
Cause of death	**%**	**Location of death**	**%**
		1] In current location	**100**
2] Injury/Traumatic	**8.7**		
3] Illness	**91.3**		

* (1st May 2023/Labor Day] was used as the beginning of the mortality recall period. All household members present during recall period adjusted for in and out-migration.

[16] South Asia CDR baseline 0.22, CDR Emergency threshold 00.40), U5DR baseline 0.46, U5DR Emergency threshold (0.90)

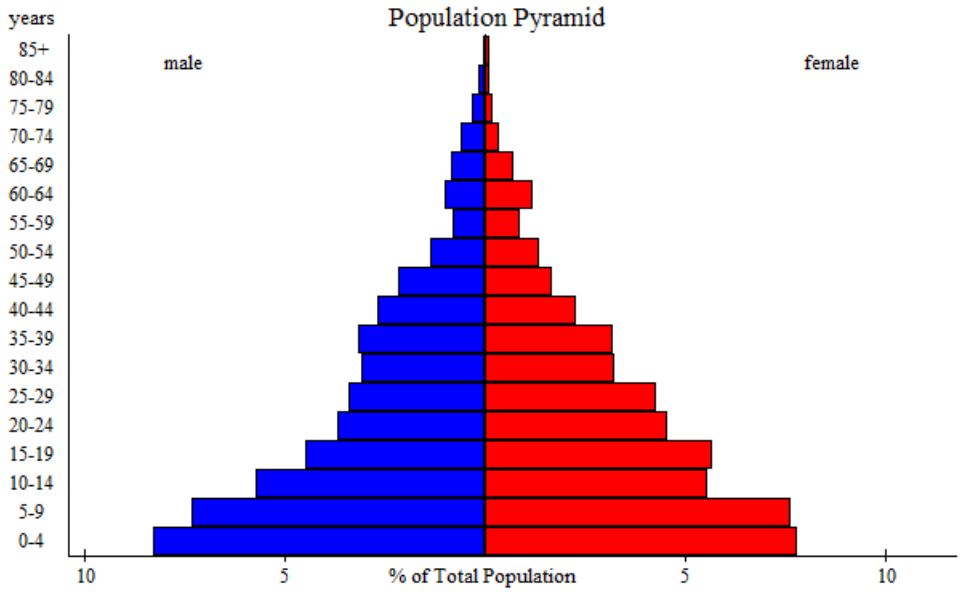

Figure 5. Population Pyramid of mortality data

Population pyramid data implies that, mortality ratio in male specifically was found higher than females in district Larkana.

5.12. Maternal Nutrition Status

Pregnancy and breastfeeding are times when the body requires more nutrients, relying less on its reserves if the nutrient intake doesn't increase. Instead, the body adjusts by enhancing how it absorbs and uses nutrients. However, insufficient nutrient intake during these phases can negatively impact both the mother and the developing child.

During pregnancy, the recommended nutrient intake rises to support the fetus's growth and development. Similarly, breastfeeding demands extra energy, protein, and nutrients for milk production. Inadequate nutrient intake during breastfeeding can result in nutrient deficiencies for the mother, reduced milk production, and hindered infant growth and development.

It's crucial to monitor the nutritional well-being of pregnant and breastfeeding women to safeguard their health and that of their infants. The Mid-Upper Arm Circumference (MUAC) measurement serves as one method to assess nutritional status in specific settings. MUAC offers a simple way to identify acute malnutrition in adults, including pregnant and breastfeeding women. However, it's important to note that MUAC alone doesn't offer a comprehensive evaluation of overall nutritional status, and other measurements and factors should be taken into consideration.

The following table displays the physiological status of women of reproductive age interviewed. It illustrates the percentages of women currently pregnant, breastfeeding, and those who are both pregnant and breastfeeding. 22.13% of women are currently pregnant (Table 21). MUAC measurement is frequently used as an indicator of nutritional status, and a measurement below 21 cm suggests a higher risk of malnutrition. Data indicates that among 235 pregnant and breastfeeding women, 15.32% were identified as malnourished in district Larkana based on MUAC criteria of <21.0cm.

Table 21: Physiological Status of Women of Reproductive Age and Malnutrition Status

Current Physiological status	N	n	%	CI 95%

Currently lactating	235	178	75.74	69.75	81.08
Currently pregnant	235	52	22.13	16.99	27.98
Pregnant & lactating	235	5	2.13	0.69	4.90
Malnutrition Status of PLWs					
Women currently malnourished (MUAC <210 mm)	235	36	15.32	10.97	20.57

5.13. Women's Education Status

Table below shows the women's education status, among the 498 women surveyed, 12.45% (with a (CI of 9.38% to 15.64%) had received primary education. This indicates that a small proportion had completed education up to the primary level, about 2.61% (with a CI of 1.53 to 4.41%) had completed secondary education. This percentage signifies a smaller subset of the surveyed population attained education up to the secondary level. A substantial majority, approximately 75.7% (with a CI of 71.7% to 79.2%), had never been to school. This indicates that a significant portion of the surveyed women did not have any formal education. A very small percentage, 2.01% (CI: 1.09% to 3.66%), had achieved education up to higher secondary level, and an even smaller percentage, 1.61% (CI: 0.82% to 3.14%), had graduated.

Table 22: Education Status

Education Status	N	n	%	CI 95%	
Primary	498	62	12.45	9.38	15.64
Secondary	498	13	2.61	1.53	4.41
Never been to School	498	377	75.7	71.7	79.2
Higher Secondary	498	10	2.01	1.09	3.66
Graduation	498	8	1.61	0.82	3.14

5.14. Access to Antenatal Care (ANC) Services

Iron/Folic Acid Supplementation during Pregnancy: Approximately 77.4% of the surveyed women received iron/folic acid supplementation during their pregnancies, indicating a relatively high coverage of this essential prenatal care. This suggests a substantial adherence to recommended supplementation, potentially contributing to improved maternal and fetal health. Family Planning Methods Knowledge: Around 52.1% of the respondents exhibited knowledge regarding family planning methods. While this suggests a moderate awareness level, efforts might be needed to increase awareness and education on various family planning options, potentially leading to better reproductive health choices. Support from Family Members during Pregnancy-Lactation Period: Roughly 59.2% of the surveyed women reported feeling supported by their family members during the pregnancy and lactation period. Adequate familial support during these crucial stages can positively impact maternal mental health and overall well-being.

Place of Last Delivery: The data reveals different settings for childbirth. Approximately 44.6% of women delivered in a hospital, while 4.8% delivered at home and a low percentage (5.7%) relied on traditional birth attendants (Dai/TBA). Encouragingly, a significant proportion chose hospitals for delivery, which is favorable for access to skilled birth attendants and potentially safer birthing conditions.

Access to Health Facilities (HFs): The data shows that around 65.0% of the respondents had access to health facilities within a 5 km radius, while 31.1% had to travel more than 6 km for healthcare services. Improving access by reducing travel distances could positively impact maternal and child health outcomes, ensuring timely care and interventions

Recollection of Maternal, Infant, and Young Child Feeding (MICYF) Key Messages: A notable 76.8% of the surveyed women were able to recall MICYF key messages, highlighting the effectiveness of messaging dissemination. These messages were primarily sourced from community health workers (CHWs)/lady health workers (LHWs), followed by doctors/nurses, family friends, and the media/radio. The low percentage of health education received from any formal health sector is an eye opener and calls for immediate attention to add health education within all health cadres' responsibilities.

Overall, the data indicates both positive aspects, such as high awareness of key messages and supplementation, as well as areas for potential improvement, like enhancing family planning knowledge and ensuring better access to healthcare facilities for pregnant women. Efforts to reinforce education and support networks could further enhance maternal and child health outcomes in the community.

Table 23: Women accessing to maternal services

Access to Maternal services	N	n	%	95% CI	
Iron/folic acid supplementation during pregnancy	360	465	77.4	73.4	80.9
Family Planning methods knowledge	488	254	52.1	47.6	56.4
Women felt supported by family members during pregnancy-lactation period	466	276	59.2	54.7	63.6
Place of last Delivery-Dai/TBA	455	26	5.7	3.93	8.24
Place of last Delivery-Hospital	455	203	44.6	40.1	49.2
Place of last Delivery-Home	455	22	4.8	3.21	7.21
Access to HFs <5 km	498	324	65.0	60.77	69.12
>6 Km	498	155	31.1	27.22	35.32
Women can recall MICYF Key Messages	461	354	76.8	72.7	80.41
Sources of Key Messages					
CHWs/LHWs		41	11.5	8.65	15.34

Doctors/Nurses	354	48	13.56	10.38	17.52
Family Friend		264	74.5	69.7	78.83
Media/Radio		1	0.28	0.05	1.58

Perceived Importance of IFA/MNT Tablets:

Agreement Levels: A significant portion of the respondents showed a positive attitude towards the importance of IFA/MNT tablets, with 51.89% strongly agreeing and 36.79% agreeing, totaling approximately 88.68% expressing some level of agreement.

Neutral and Disagreement Levels: A small percentage remained neutral (4.72%), and a lesser proportion disagreed (6.60% strongly disagreed).

Consumption of IFA/MNT Tablets:

Among the surveyed population, 55.88% reported consuming IFA/MNT tablets, indicating a majority adhering to the intake of these supplements. However, a notable 38.24% reported not consuming IFA/MNT tablets. Don't Know and Partial Responses: A very small percentage (2.94% each) either did not have sufficient information (don't know) or consumed the tablets partially.

The data shows a divergence between the perceived importance of IFA/MNT tablets and the actual consumption rates. While a considerable percentage recognized the importance of these supplements, indicating agreement or strong agreement, the actual consumption rates are lower, with over a third of the surveyed population not consuming the tablets. This disconnects between perception and action suggests potential barriers or challenges in translating positive attitudes towards supplementation into actual practice. Addressing these barriers could involve targeted education campaigns, improved access to supplements, and enhancing awareness about the benefits of IFA/MNT tablets to bridge this gap and improve consumption rates among the population

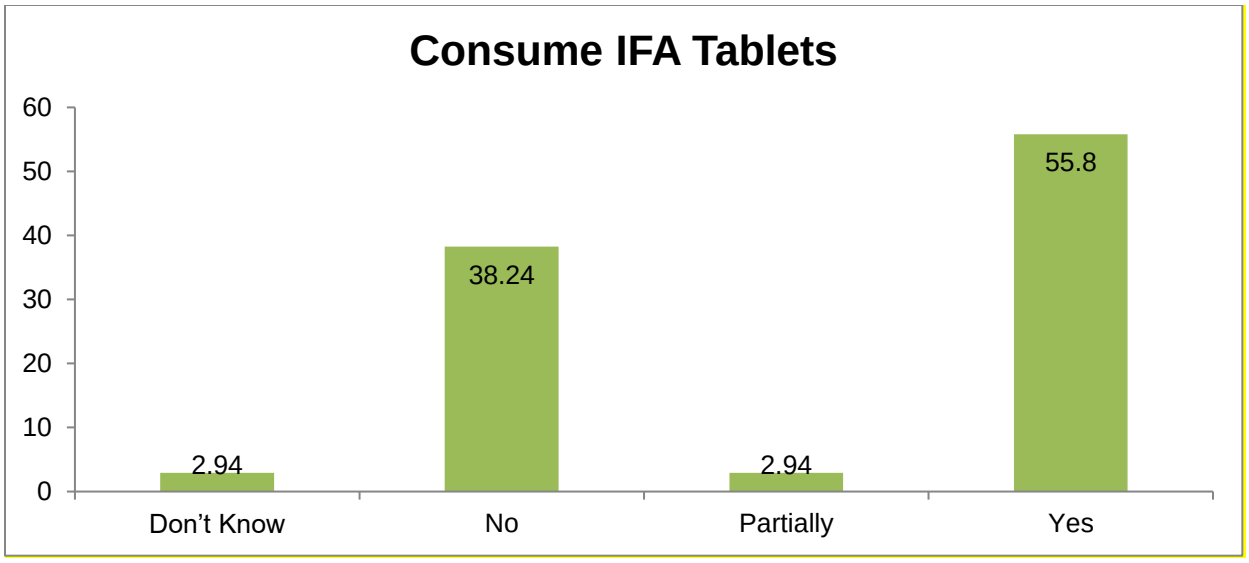

Figure 6: Status of IFA Supplements among WRA

5.15. Health and Child Immunization

The morbidity and vaccination of children in the population was assessed during the survey period by directly interviewing the child's mother or the care giver.

Deworming Coverage (Children 12-59 months)

The deworming coverage for children aged 12 to 59 months stands at 23.8%. This indicates the percentage of children who received deworming treatment within this age group, aiming to prevent and manage parasitic infections.

Vitamin-A Coverage (Children 6-59 months)

The coverage for Vitamin-A supplementation among children aged 6 to 59 months is reported at 60.2%. Vitamin-A supplementation is crucial for supporting immune function and overall health in young children.

Measles Vaccination Coverage

Measles with Card (9-59 months)

The coverage based on **card** records for measles vaccination among children aged 9 to 59 months is 38.4%.

Measles with Recall (9-59 months)

The coverage based on recall for measles vaccination in the same age group is slightly lower at 36.2%. There appears to be a slight discrepancy between documented vaccination records and the recall of receiving the measles vaccine.

Number of Diarrheal Episodes

- 1-5 Episodes: Out of 206 reported cases, 85.9% had experienced between 1 to 5 episodes of diarrhea.

- >5 Episodes: A smaller subset, 14.08%, encountered more than 5 episodes of diarrhea, which may indicate a group with a higher frequency of diarrhea occurrences.

Diarrhea Treatment with Zinc or ORS (0-59 months): Among children aged 0 to 59 months who had diarrhea, 26.9% received treatment with Zinc or ORS. While this percentage indicates a portion receiving appropriate treatment, there is potential for improvement in ensuring a higher percentage of affected children receive these essential treatments during diarrheal episodes.

Table 24. Health and Child Immunization

Health and Child Immunization				
Indicators	**N**	**n**	**Percent**	**95% CI Value**
Deworming Coverage –Children 12-59 m	483	115	23.8	(20.8-27.8)
Vitamin-A Coverage-Children 6 59 m	477	287	60.2	(55.71-64.4)
Measles with Card 9-59 m	464	178	38.4	(34.0-42.8)
Measles with Recall 9-59 m	464	168	36.2	(31.9-40.6)
Number of Diarrhea Episodes 1-5 Episodes >5 Episodes	 206 206	 177 29	 85.9 14.8	 (9.64 19.59) (80.41-90.3)
Diarrhea Treatment with Zinc or ORS 0-59 m	216	58	26.9	(21.0-33.2)

5.16. Family Planning

Mother's Knowledge Regarding Family Planning Methods

Overall, these figures illustrate the distribution of responses from mothers regarding their knowledge about family planning methods. A majority of the mothers responded positively (52.13%), indicating they have knowledge about these methods. However, a significant portion either responded negatively (44.8%), indicating a lack of knowledge, or expressed uncertainty (2.84%). Additionally, there was a very small proportion (0.20%) where the question might not have been relevant or applicable.

The family planning services needs to be integrated into the primary health care package and all critical times according to the WHO guidelines shall be capitalized for providing family planning services from within the health sector like the preconception phase, ANC visits and PNC visits.

Table 25 Mother's Knowledge Regarding Family Planning methods

Indicators	n	%	95% CI
Don't Know	14	2.84	(1.70 -4.71)
No	221	44.8	(40.49 – 49.24)
Not Applicable	1	0.20	(0.04 – 1.14)
Yes	257	52.13	(47.72 – 56.51)

Previous history of using Family Planning Methods

Condoms (8.3%): Condoms are a barrier method of contraception used to prevent pregnancy and reduce the risk of sexually transmitted infections (STIs). This percentage indicates the proportion of individuals or couples using condoms as their preferred method of family planning.

Implants (3.4%): Implants are long-acting reversible contraceptives that are inserted under the skin and provide contraception for several years. The percentage suggests the relatively lower usage of implant-based contraception among the surveyed population.

IUDs (Intrauterine Devices) (11.1%): IUDs are small, T-shaped devices inserted into the uterus to prevent pregnancy. The percentage reflects the proportion of individuals or couples using IUDs as a method of family planning.

Periodic Abstinence (4.89%): Periodic abstinence involves avoiding sexual intercourse during the fertile window of a woman's menstrual cycle to prevent pregnancy. This percentage represents those practicing this method within the surveyed population.

Pills (12.5%): Birth control pills, also known as oral contraceptives, are hormonal medications taken daily to prevent pregnancy. The percentage denotes the usage of contraceptive pills among the surveyed individuals or couples.

None (19.2%): This category indicates individuals or couples who are not currently using any form of contraception for family planning.

Injectables (40.2%): Injectable contraceptives are hormonal shots administered at regular intervals to prevent pregnancy. The percentage highlights the substantial usage of injectable contraception within the surveyed population, suggesting it as a prevalent method among respondents.

These percentages reflect the distribution of different types of family planning methods used by individuals or couples within the surveyed population. The data provides insights into the prevalence and diversity of contraceptive methods adopted for family planning purposes.

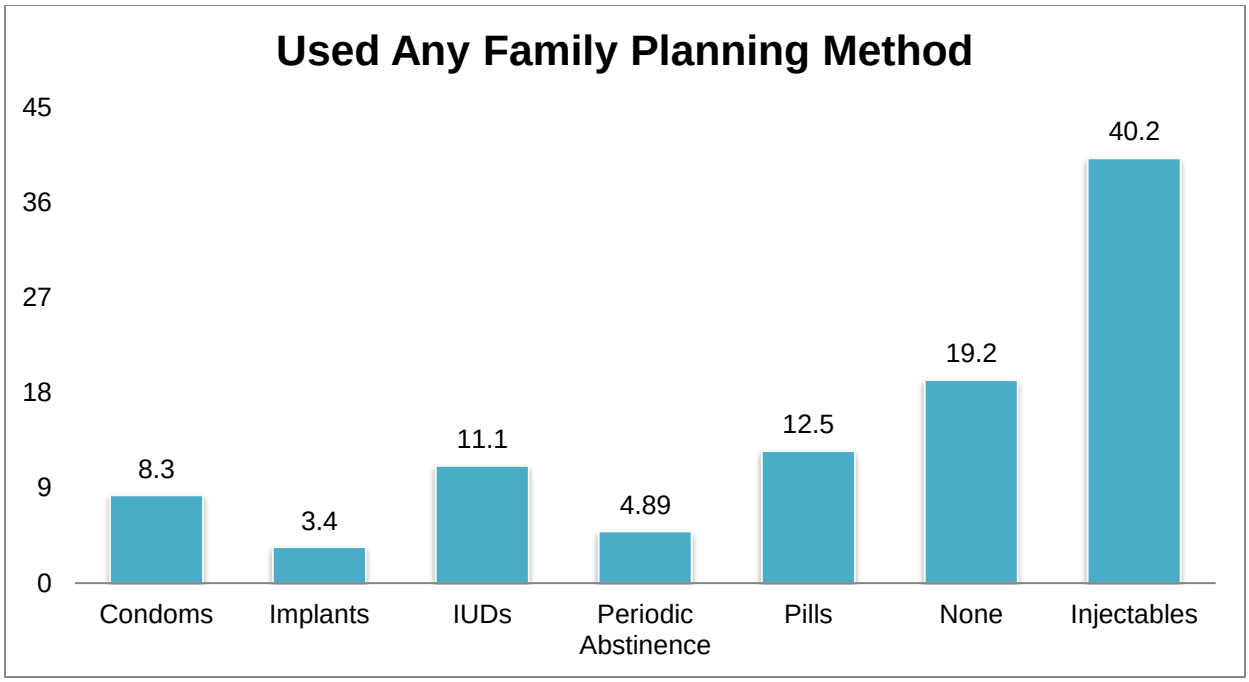

Figure 7: Use of Family Planning Method

5.17. Knowledge regarding Breast feeding

Opinion Regarding Duration of Exclusive Breastfeeding:

- 0-2 Months: Only 1.97% of mothers expressed the opinion that exclusive breastfeeding should be practiced for 0-2 months.
- 0-4 Months: A larger percentage, 15.79%, believed that exclusive breastfeeding should continue for 0-4 months.
- 0-6 Months: The majority, accounting for 82.24%, held the opinion that exclusive breastfeeding should last for 0-6 months. This aligns with the World Health Organization's recommendation of exclusive breastfeeding for the first six months of a baby's life.

Age to Stop Breastfeeding:

- Before 6 Months: A very low percentage (0.60%) of mothers suggested stopping breastfeeding before the infant reaches 6 months of age.
- After 6 Months: A slight increase was seen, with 1.41% of mothers advocating for breastfeeding cessation after 6 months.
- 10-12 Months: Around 4.64% believed that breastfeeding should continue until the child reaches 10-12 months.

- 13-21 Months: These age ranges had varying percentages (ranging from 2.62% to 9.88%) of mothers opining that breastfeeding should continue until the child is between 13 to 21 months.
- >23 Months: The highest percentage (76.81%) of mothers believed that breastfeeding should continue beyond 23 months.

Frequency of Breastfeeding:

- >11 times: 38.8% of mothers reported breastfeeding more than 11 times a day.
- 0-5 times: A smaller percentage (14.6%) reported breastfeeding 0-5 times a day.
- 6-10 times: The majority (48.5%) breastfed their infants between 6 to 10 times a day.

The data reveals diverse opinions among mothers regarding the duration and age to stop breastfeeding. The majority aligns with global recommendations of exclusive breastfeeding for the first six months, yet there's variance in opinions about when to stop breastfeeding. Moreover, the frequency of breastfeeding varies among mothers, with a significant portion breastfeeding more than 11 times a day, indicating high breastfeeding frequency among this population.

Table 26 Mother's Knowledge Regarding Breastfeeding

Mother's Knowledge Regarding Breastfeeding			
Indicators	**n**	**Percent**	**95% CI Value**
Opinion regarding duration of Exclusive Breastfed			
0-2 Months	9	1.97	1.04-3.71
0-4 Months	72	15.79	12.73-19.42
0-6 Months	375	82.24	78.46-85.47
Age to stop breastfeeding			
Before 6 Months	3	0.60	0.21-1.76
After 6 Months	7	1.41	0.69-2.88
10-12 Months	23	4.64	3.11-6.86
13-15 Months	13	2.62	1.54-4.43
16-18 Months	16	3.23	2.0-5.18
18-21 Months	49	9.88	7.55-12.82
>23 Months	381	76.81	72.9-80.31
Frequency of breastfeeding			
>11 times	212	38.8	34.8-42.9
0-5 times	80	14.6	11.9-17.8
6-10 times	254	48.5	42.3-50.7

5.18. Infant and Young Child Feeding-IYCF Key indicators

Infant and young child feeding indicators are employed to monitor the feeding practices of infants and young children aged between 0 and 23 months. Protection and promotion of appropriate infant and young child feeding (IYCF) helps to save the lives of the most vulnerable infants and young children, and plays a key role in preventing malnutrition and micronutrient deficiencies.

Table 27. MIYCF Key Indicators

S No	Section 1. Summary of IYCF indicators[17]			
	Indicators	**Frequency**	**Percent**	**CI value 95%**
1	Ever breastfed-EvBF (0-23 M)	236 (244)	96.7%	(93.64-98.57)
2	Early initiation of breastfeeding (EIBF) (0-23 M)	71 (244)	29.1%	(23.48-35.23)
3	Exclusively breastfed for the first two days after birth-(EBF2D) (0-23 M)	135 (244)	55.3%	(48.58-61.67)
4	Exclusive breastfeeding under six months (EBF) 0-5 M)	18 (26)	69.2%	(48.21-85.67)
5	Continued breastfeeding (CBF) (12-23 M)	58 (141)	41.1%	(32.92-49.73)
6	Introduction of solid, semisolid or soft foods (6–8 M) (ISSSF)	23 (31)	74.2%	55.39-88.14)
7	Minimum dietary diversity 6–23 months (MDD)	33 (218)	15.1%	(10.66-20.60)
8	Minimum meal frequency 6–23 months (MMF)	14 (218)	6.4%	(03.55-10.54)
9	Minimum acceptable diet 6–23 months (MAD)	11 (218)	5.1%	(02.55-08.85)
10	Egg and/or flesh food consumption 6–23 months (EFF)	34 (218)	15.6%	(11.05 – 21.11))
11	Bottle feeding 0–23 months (BoF)	208 (244)	85.3%	(80.16-89.45)
12	Colostrum given (0-59)	176 (244)	72.13%	(66.05 – 7.6)

Ever Breastfed (EvBF) (0-23 Months): Frequency: 236 out of 244 children (96.7%) in the age range of 0-23 months were reported to have been breastfed at some point in their lives.

Early Initiation of Breastfeeding (EIBF) (0-23 Months): Frequency: 71 out of 244 children (29.1%) received early initiation of breastfeeding within the first hour after birth. The acceptable levels of institutional deliveries compared with low levels of EIBF shows a low tendency of MNCH staff especially the birth attendants and nurses of putting the child to breast immediately after birth. The compliance of MNCH SOPs for nutrition indicators needs to strengthened, as in this example failure of EIBF, Kangroo mother care, neonatal checkups etc. are proven factors contributing to the highest neonatal mortality rates in the first 3 days of life.

Exclusively Breastfed for the First Two Days after Birth (EBF2D) (0-23 Months): Frequency: 135 out of 244 children (55.3%) were exclusively breastfed for the first two days after birth.

Exclusive Breastfeeding under Six Months (EBF) (0-5 Months): Frequency: 18 out of 26 children (69.2%) in the age range of 0-5 months were exclusively breastfed, meeting the criteria for exclusive breastfeeding.

Continued Breastfeeding (CBF) (12-23 Months): Frequency: 58 out of 141 children (41.1%) aged between 12-23 months continued to breastfeed.

Introduction of Solid, Semisolid, or Soft Foods (6–8 Months) (ISSSF): Frequency: 23 out of 31 children (74.2%) between 6-8 months were introduced to solid, semisolid, or soft foods.

[17] https://iris.who.int/bitstream/handle/10665/340706/9789240018389-eng.pdf?sequence=1

Minimum Dietary Diversity 6–23 Months (MDD): Frequency: 33 out of 218 children (15.1%) aged 6-23 months achieved minimum dietary diversity.

Minimum Meal Frequency 6–23 Months (MMF): Frequency: 14 out of 218 children (6.4%) aged 6-23 months met the minimum required meal frequency.

Minimum Acceptable Diet 6–23 Months (MAD): Frequency: 11 out of 218 children (5.1%) aged 6-23 months met the criteria for a minimum acceptable diet.

Egg and/or Flesh Food Consumption 6–23 Months (EFF): Frequency: 34 out of 244 children (13.9%) between 6-23 months consumed egg and/or flesh food.

Bottle Feeding 0–23 Months (BoF): Frequency: 208 out of 244 children (85.3%) aged 0-23 months were reported to have been bottle-fed at some point which is alarmingly high

These indicators measure different aspects of infant and young child feeding practices, including breastfeeding initiation, exclusivity, and introduction of complementary foods, dietary diversity, and bottle-feeding practices within the specified age ranges.

Table 28. Reasons for Stopping Breastfeeding

Reasons	n	%	95% CI
Became Pregnant	27	44.2	31.55 – 57.55
Mother Ill/weak	15	24.59	14.46 – 37.29
Child ill	1	1.64	0.04 – 8.80
Child refused	9	14.75	6.98 – 26.17
Not enough milk	4	6.56	1.82 – 15.95
Weaning age	5	8.20	2.72 – 18.10

The above table presents the reasons for discontinuing breastfeeding, indicating frequencies and their respective percentages with 95% confidence intervals. Among the reported reasons, becoming pregnant was cited by 44.2% of respondents as the primary cause for stopping breastfeeding. The rate of repeated pregnancies indicates a high focus to strengthen the family planning services, access to information, commodities and services to the women so as to prevent unplanned pregnancies in order to provide an ample birth spacing for the nutrient store replenishment of the mother as well as 2 years continued breastfeeding for the child. There is a important to integrate FP services at every ANC/PNC or family physician consultations. The second highest factor documented was maternal illness or weakness at 24.59%. Only 1.64% of cases mentioned the child's illness as a factor, while about 14.75% reported that their child refused to breastfeed. Additionally, perceived insufficient milk supply accounted for 6.56% of cases, and approximately 8.20% stated that reaching the desired weaning age led to the cessation of breastfeeding. These percentages underscore various factors contributing to the cessation of breastfeeding, including maternal health, child preferences, and the onset of pregnancy, shedding light on the diverse reasons affecting breastfeeding practices within the surveyed population.

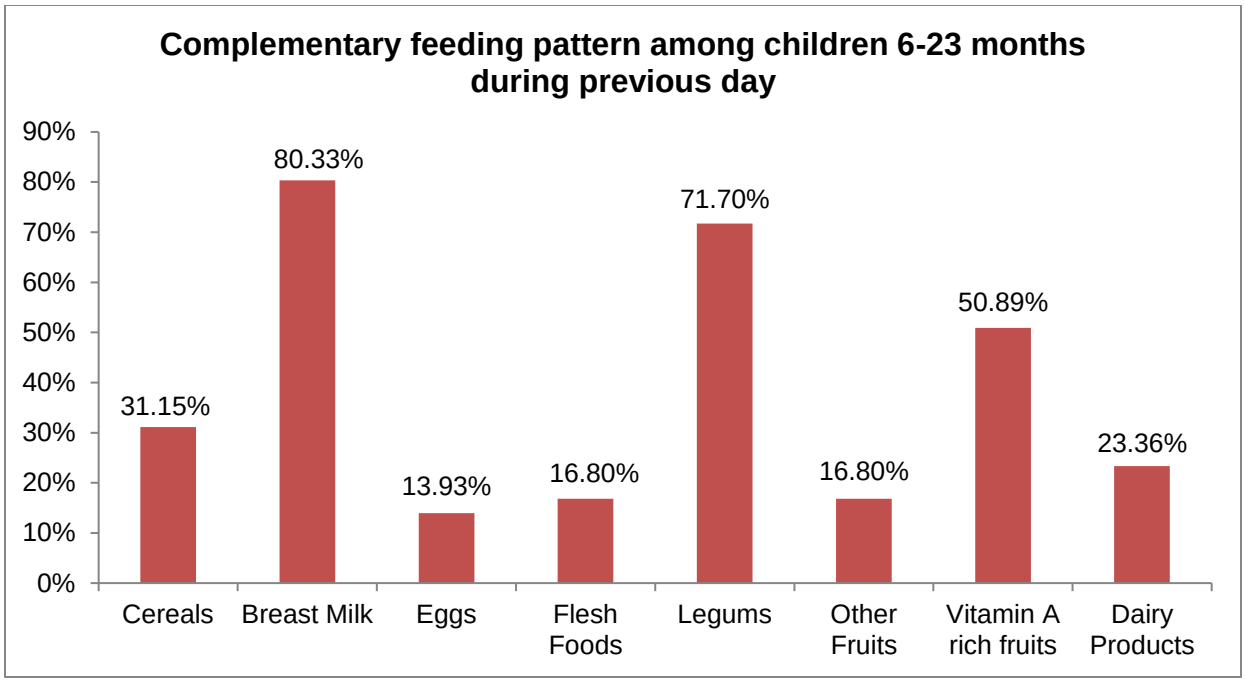

Figure 8. Complementary feeding pattern

Breast Milk (80.33%): This high percentage indicates that breastfeeding remains a significant component of the diet for children in this age group, reinforcing the importance of continued breastfeeding for the nutritional needs of infants and toddlers.

Legumes (71.70%): Legumes, such as lentils, beans, and peas, make up a substantial portion of the complementary diet. They serve as an essential source of plant-based protein, fiber, and other essential nutrients, indicating their significant inclusion in the children's diets.

Vitamin A Rich Fruits (50.89%): Foods rich in Vitamin A are crucial for children's growth and development. This percentage signifies a moderate but substantial consumption of fruits with high Vitamin A content, indicating an emphasis on providing essential vitamins and nutrients.

Cereals (31.15%): Cereals, such as rice, wheat, or oats, contribute to about a third of the diet. These are common sources of carbohydrates and provide energy, although this percentage suggests a moderate intake compared to other food groups.

Dairy Products (23.36%): Dairy products are another source of essential nutrients like calcium and protein. While the percentage is lower than some other groups, it still demonstrates a significant inclusion of dairy in the children's diets.

Eggs (13.93%): Eggs are a good source of protein and various vitamins. This percentage shows a moderate consumption of eggs among the children in this age group.

Flesh Foods (16.80%): Flesh foods include meat or fish, providing crucial proteins and nutrients. This percentage indicates a moderate intake of these foods in the diet of the children.

Other Fruits (16.80%): Besides Vitamin A-rich fruits, other types of fruits are also being included, although the percentage suggests a moderate representation in the overall diet.

In summary, while breast milk remains a primary component of the diet, the data showcases a moderate to high inclusion of legumes, Vitamin A-rich fruits, and cereals, emphasizing a diverse intake of food groups. Although eggs, flesh foods, dairy products, and other fruits show relatively lower percentages, they still contribute to the overall nutritional intake of children aged 6 to 23 months, providing essential nutrients for their growth and development.

5.19. WASH

5.19.1. Access to drinking water source: The below data shows the respondents access to the water point from their home

No Time: Larkana reported a good level of accessibility to drinking was as compared to other districts as mostly being handpumps/boreholes and public taps where 49.2% of the respondents (245 out of 498) reported not spending any specific time accessing their primary source of water. This could suggest that this group might have immediate access to water within their homes or very close proximity, requiring minimal time for retrieval.

1-10 minutes: Around 43.9% (219 out of 498) indicated spending between 1 to 10 minutes accessing their primary water source. This is a substantial portion and indicates a reasonable duration spent to collect water, possibly suggesting that they need to travel a short distance or wait in line to acquire water, however, they are not confident on quality of water.

11-20 minutes: Only A small percentage of respondents, about 3.01% (15 out of 498), reported spending between 11 to 20 minutes to access their primary water source. This group likely travels a bit farther or waits longer for water compared to the previous category.

More than 20 minutes: An even smaller percentage, 2.41% (12 out of 498), reported spending over 20 minutes to obtain water. This group probably has to travel a significant distance or endure substantial waiting times to access their primary water source.

Don't Know: A negligible percentage, about 1.41% (7 out of 498), indicated they were unsure about the time spent accessing their primary water source.

Overall, the data demonstrates varying durations individuals spend in obtaining their primary water supply, ranging from no specific time to considerable durations, possibly reflecting different distances or waiting periods to access water sources within their communities, however, most of the households are not confident on quality of water.

Table 29. Time to cover the distance from house to main source of water

Duration	N	n	%	95% CI	
No Time	498	245	49.2	44.83	53.58
1-10 mints	498	219	43.9	39.68	48.37
11-20 mints	498	15	3.01	1.83	4.91
>20 mints	498	12	2.41	1.38	4.16
Don't know	498	7	1.41	0.68	2.87

Source of water

Hand pumps/borehole: This category constitutes the most significant proportion, with 68.6% (342 out of the total respondents) relying on hand pumps or boreholes as their primary source of drinking water. Hand pumps and boreholes typically access groundwater and are prevalent in many regions as a source of clean water.

Public tap/standpipe: Around 15.8% (79 out of the total respondents) reported using public taps or standpipes as their source of drinking water. These sources usually distribute treated or piped water from centralized systems to the public.

Piped Connection to house: A smaller percentage, 13.0% (65 out of the total respondents), reported having a piped connection directly to their house for drinking water. This indicates a minority of individuals with the convenience of direct access to piped water within their homes.

Hand pumps and protected springs: A very small proportion, 1.80% (9 out of the total respondents), reported using hand pumps and protected springs as their drinking water sources. Protected springs are natural water sources safeguarded against contamination.

Protected Spring: An even smaller fraction, 0.60% (3 out of the total respondents), reported relying on protected springs exclusively for drinking water. This indicates a very minimal usage of this particular water source within the surveyed population.

Overall, the data illustrates a hierarchy in the utilization of different water sources, with hand pumps/boreholes being the most commonly used, followed by public taps/standpipes and piped connections. Hand pumps and protected springs, as well as protected springs alone, constitute a very small proportion of the surveyed population's water sources.

Table 30. Sources of Water

Sources of Drinking Water			
Indicators	**Frequency**	**Percent**	**95% CI value**
Hand pumps/borehole	342	68.6	64.06-72.21
Public tap/standpipe	79	15.8	12.92-19.33
Piped Connection to house	65	13.0	10.37-16.30
Hand pumps and protected springs	9	1.80	0.95-3.40

Protected Spring	3	0.60	0.21-1.76

Water Treatment: Among the respondents, a substantial majority, 95.78% (448 out of the total), confirmed treating their water sometimes, demonstrating a prevalent but not universal practice of water treatment among the surveyed population. However, a very small proportion, 2.61% (13 out of the total), indicated that they don't know about water treatment. 5.82% (29 out of the total), reported not treating their water before use.

Household Water Collection by Adult Females: A significant percentage, 90.7% (452 out of 498), reported adult females being primarily responsible for household water collection, indicating the predominant role of women in this task within the surveyed households.

Adequate Privacy in Toilet Facilities: Around 71.3% (354 out of 498) of the surveyed households reported having adequate privacy in their toilet facilities, suggesting that a notable portion of the households has satisfactory arrangements ensuring privacy in their toilets.

Open Defecation Practice: Approximately 8.69% (43 out of 498) of respondents reported practicing open defecation, highlighting that a fraction of the surveyed population still engages in this unhygienic practice.

Availability of Soap: A majority, 84.54% (421 out of 498), reported having soap available in their households. However, a considerable minority, 14.86% (74 out of 498), reported that soap is not available.

Households Unable to Afford Soap: Among a subset of respondents, 36.11% (26 out of 72) reported that their households cannot afford soap, indicating economic constraints for a notable portion of the surveyed population in accessing this hygiene essential.

Table 31. Water, Sanitation and Hygiene (WASH)

	n/N	%	95% CI
Water Treatment	13	2.61	1.53 – 4.41
Don't Know	29	5.82	4.08 – 8.24
No treatment	448	95.78	87.01 – 92.30
Yes treated sometimes	8	1.61	0.82 – 3.14
Household water collection by adult Females	452 (498)	90.7	87.9 – 93.0
Adequate privacy in toilet facilities	354 (498)	71.3	67.2 – 75.17
Open Defecation Practice	43 (498)	8.69	6.51 -11.5
Household water collection by adult Male	30 (498)	6.02	4.25 – 8.47
Soap available	421 (498)	84.54	81.10 -87.45
Soap not available	74 (498)	14.86	12.0 – 18.25
Households cannot afford soap	26 (72)	36.11	25.12 -48.29

5.19.2. Latrine availability and Open defecation

Household Latrine: A significant percentage, 99.5% (496 out of the total), reported having a household latrine, signifying a high prevalence of private sanitation facilities within the surveyed households.

Open Defecation: Despite the majority having household latrines, 19.96% (99 out of the total) of respondents still reported practicing open defecation. This suggests that although most households have latrines, a noteworthy portion of the population continues to engage in open defecation.

Reasons for Open Defecation: Among those practicing open defecation, various reasons were reported. About 9.38% mentioned that the latrine was too far away, indicating issues related to accessibility. A significant portion, 52.08%, reported the lack of availability of a latrine as a reason for open defecation, emphasizing a notable gap in access to proper sanitation facilities. Approximately 1.04% cited being too tired, while 36.46% mentioned inadequate lighting at night as reasons for open defecation. These reasons collectively highlight challenges related to accessibility, availability, convenience, and infrastructure inadequacies contributing to open defecation practices despite the availability of household latrines in a vast majority of the surveyed households.

Table 32 Household's Toilet Facilities

N: 498	n	%	95% CI
Household latrine	496	99.5%	93.09 – 100.0
Open defecation	99	19.96	16.68 -23.70
Reasons for open defecation			
Latrine too far	9	9.38	4.38 – 17.05
No larine available	50	52.08	41/64 – 62.39
Too tired	1	1.04	0.03 – 5.67
Too dark at night	35	36.46	26.87 -46.91

5.20. Food Security

5.20.1. Minimum Dietary Diversity -Women

High Diversity: 33.6% (238 out of 708) of the surveyed women exhibited a high level of dietary diversity. This indicates that this subset of women had a diverse diet, likely incorporating a wide range of food groups or types into their regular meals.

Medium Diversity: Approximately 27.5% (195 out of 708) of the surveyed women fell into the medium diversity category. This suggests that these women exhibited a moderate level of dietary diversity, possibly consuming a decent variety of food groups, although not as broad as those in the high diversity category.

Low Diversity: The largest proportion, 38.8% (275 out of 708) of the surveyed women, fell into the low diversity category. This indicates that this group had limited dietary diversity, potentially

consuming a narrower range of food groups, which might impact the nutritional quality and adequacy of their diets.

Overall, these findings illustrate the varying levels of dietary diversity among women surveyed, with a considerable portion having lower dietary diversity, potentially indicating limitations in accessing or incorporating a wide range of foods in their regular diets, which can affect their nutritional intake and overall health.

Table 33. Minimum Dietary Diversity-Women (MDD-W)

S No	MDD-W			
	Indicators	**Frequency**	**Percent**	**CI value 95%**
34	**Minimum Dietary Diversity-Women (MDD-W)**			
a	High	238 (708)	33.6%	(30.23-37.1(
b	Medium	195 (708)	27.5%	(24.3-30.9)
c	Low	275 (708)	38.8%	(35.3-42.4)

The data provided relates to food insecurity experiences and coping strategies among a surveyed population. Here's an interpretation of the information:

5.20.2. Food Insecurity Experience Scale (FIES):

The Food Insecurity Experience Scale (FIES) measures the extent of food insecurity experienced by individuals or households. It typically assesses the prevalence of different levels of food insecurity based on the responses of surveyed individuals. This scale often categorizes food insecurity into various levels, such as:

None/Light Hunger: About 26.7% (133 out of 498) of respondents reported experiencing none or very light levels of hunger. This suggests that a portion of the surveyed population had minimal or no food insecurity experiences.

Moderate Hunger: Roughly 20.68% (103 out of 498) reported experiencing moderate levels of hunger. This indicates a smaller, but notable, proportion faced a significant level of food insecurity.

Severe Hunger: The largest group, constituting 52.61% (262 out of 498), reported experiencing severe hunger. This percentage signifies that over half of the surveyed population faced severe food insecurity experiences, indicating a concerning level of inadequate access to food.

Reduced Coping Strategy Index (rCSI):

The Reduced Coping Strategy Index (rCSI) assesses the coping mechanisms employed by individuals or households in response to food insecurity. It categorizes these strategies into various levels to understand how people manage or mitigate the effects of food insecurity. The rCSI often includes categories such as:

High Coping: Around 48.5% (242 out of 498) of respondents reported using high coping strategies. These strategies might include measures like borrowing money, reducing food portion sizes, or skipping meals, indicating that a significant portion of the surveyed population had to employ substantial efforts to manage food insecurity.

Medium Coping: Approximately 20.24% (101 out of 498) reported employing medium coping strategies, indicating a smaller but notable proportion attempting to cope with food insecurity.

No or Low Coping: A total of 31.26% (156 out of 498) reported having no or low coping strategies. This group did not faced difficulties in addressing or mitigating the effects of food insecurity, potentially indicating a sufficient resources or support to manage food-related challenges.

Overall, the data demonstrates a significant prevalence of severe hunger experiences among the surveyed population, with over half reporting severe levels of food insecurity. Additionally, while nearly half of the respondents reported employing high coping strategies, a notable portion faced challenges in coping with food insecurity. This highlights the urgent need for targeted interventions and support systems to address the underlying issues contributing to food insecurity and the lack of coping strategies within this population.

Table 34. Food Insecurity Security Experience Scale

Food Insecurity Security Experience Scale				
Indicators		**Frequency**	**Percent**	**CI value 95%**
35	**Food Insecurity Experience Scale (FIES)[18]**			
a	None/Light Hunger	133 (498)	26.7%	(23.0-30.7)
b	Moderate Hunger	103 (498)	20.68%	(17.3-24.46)
c	Severe Hunger	262 (498)	52.61%	(48.22-56.9)
36	**Reduced Coping Strategy Index (rCSI)[19]**			
a	High Coping	242 (498)	48.5%	(44.1-52.8)
b	Medium	101 (498)	20.24%	(16.9-23.9)
c	No or Low Coping	156 (498)	31.26%	(27.35-35.4)

6. Discussion

The survey findings revealed that Global Acute Malnutrition (GAM) prevalence based on WHZ among children 6-59 months found “Very High” in Larkana (21.1%). The overall combined GAM [cGAM] prevalence found 24.6% [20.6 - 29.1 95% C.I.] with a combined SAM (cSAM) rate of 8.1% [5.9 – 10.9 95% C.I.] There was statistically no significant difference found in cGAM and cSAM [P=0.462, 0.777]. The cGAM and cSAM is an aggregated indicator which provides overall acute malnutrition prevalence based on WHZ and/or MUAC and/or Oedema altogether.

Looking at combined prevalence, it is clear that the cGAM and cSAM rates were notably different by WHZ and MUAC which suggests that use of only MUAC or only WHZ based rates might lead

[18] 0-1 score: None or light hunger, 2-3 scores,: Moderate hunger, 4-6 scores: Severe hunger
[19] No or low coping (CSI= 0-3), medium (CSI = 4-9, high coping (CSI ≥10).

to under estimation as well as of caseload when it comes to programming. Therefore, it is recommended to use cGAM estimate from routinely reported population-representative nutrition surveys globally, in addition to WHZ and MUAC, to enable context-specific decision-making, caseload calculation and Joint Response Planning.

The findings show varying coverage rates for different health interventions among children. While there's moderate to good coverage in areas like Vitamin-A supplementation, measles vaccination, and deworming, there are areas for potential improvement. Encouraging increased coverage for diarrhea treatment with Zinc or ORS and addressing potential discrepancies in measles vaccination documentation and recall could significantly contribute to better child health outcomes in the region. Additionally, efforts to further enhance deworming coverage could aid in reducing parasitic infections among children in the specified age group.

The table below presents statistics on nutritional indicators (Global Acute Malnutrition, Underweight, and Stunting) in Larkana from different years—NNS 2017-18, MICS 2018-19, and SMART 2023. These indicators offer insights into the nutritional status and health of children in the region.

The prevalence of GAM has shown a decrease from 22.9% (NNS 2017-18) to 15.0% (MICS 2018-19) and then a slight increase to 21.1% (SMART 2023). This might indicate fluctuations or changes in nutritional interventions or socioeconomic conditions impacting the nutritional status of children over these years. The prevalence of underweight children decreased from 42.8% (NNS 2017-18) to 37.1% (MICS 2018-19) and further declined to 27.2% (SMART 2023). This reduction may suggest improvements in nutritional programs, healthcare, or socio-economic conditions that have positively impacted child nutrition in Larkana. Stunting rates declined gradually from 49.3% (NNS 2017-18) to 45.2% (MICS 2018-19) and further to 40.2% (SMART 2023). This decreasing trend might indicate positive strides in addressing long-term nutritional issues or improvements in overall child health and access to essential services.

The overall trend across these surveys shows positive improvements in nutritional indicators for children in Larkana. There's a consistent decline in underweight and stunting rates, indicating potential successes in various health and nutrition programs, community interventions, or socio-economic developments targeting child health. While there have been improvements, the latest SMART 2023 data shows a slight increase in Global Acute Malnutrition (GAM). This could raise concerns and prompt a need for closer examination to understand the potential causes or factors contributing to this increase despite positive trends in other indicators.

To understand these trends comprehensively, it's crucial to explore factors contributing to these changes, including interventions, policies, socio-economic changes, dietary habits, access to healthcare, and sanitation facilities. Analyzing the contextual differences between surveys and identifying any discrepancies or outliers is essential for more accurate interpretation.

Efforts should focus on sustaining the positive trajectory in reducing under nutrition while addressing emerging challenges like the slight increase in GAM. This may involve targeted interventions, community engagement, health education, and continued monitoring and evaluation to ensure sustained progress in improving child nutrition in Larkana.

Table 35. Malnutrition Trends in past 5 years

Larkana			
Indicators	NNS 2017-18	MICS-2018-19	SMART 2023
Global Acute Malnutrition	22.9%	15.0%	21.1%
Underweight	42.8%	37.1%	27.2%
Stunting	49.3%	45.2%	40.2%

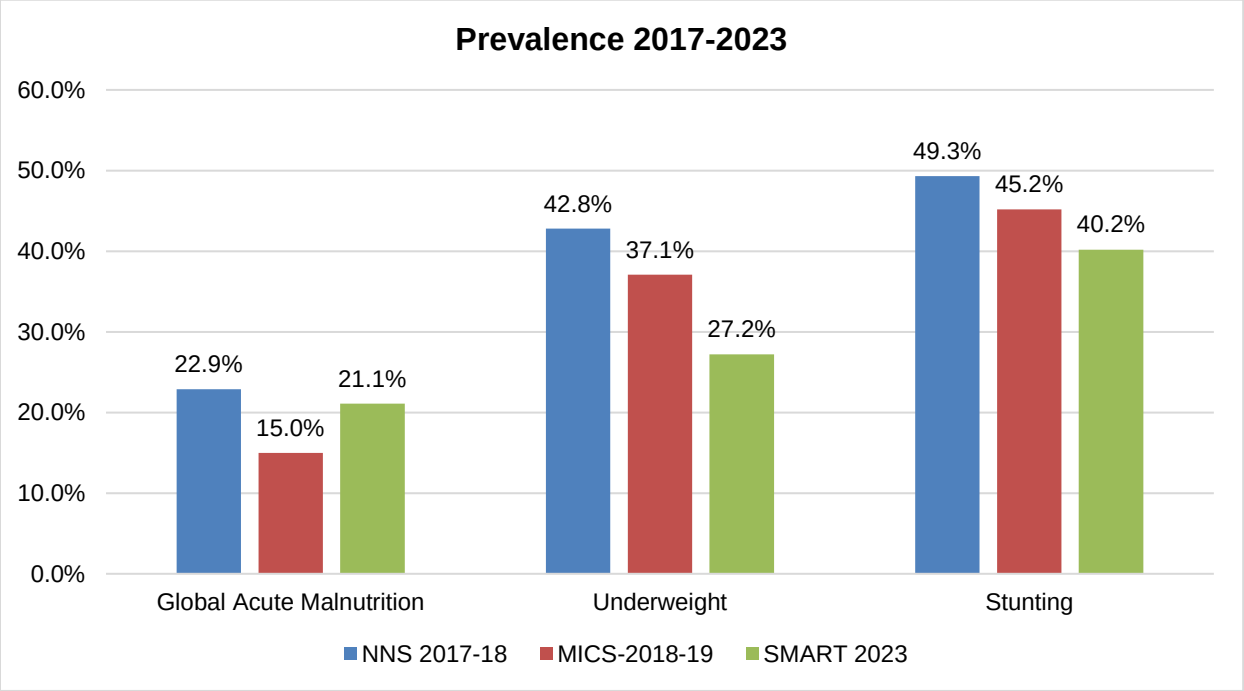

Figure 9 Malnutrition Trends in past 5 years

7. Recommendations

Based on the findings of the SMART Nutrition Survey in Larkana, Sindh in 2023, the following recommendations and action plan are proposed for policy makers to address the identified issues:

Indicators	Areas	Actions
Malnutrition and Nutritional Status of Children	Targeted Nutrition Programs	Develop and implement targeted nutrition programs focusing on reducing wasting, stunting, and underweight among children aged 6-59 months. These programs should include strategies for improving dietary diversity, promoting breastfeeding practices, enhancing access to nutritious food, micronutrient supplementation, and addressing acute malnutrition through therapeutic feeding programs. District level Nutrition strategies can play a key role in implementing context-specific programs
	Collaboration Mechanism	Collaboration with healthcare providers, community leaders, and NGOs is essential for effective implementation. The family MUAC approach should be promoted with mapping of literate mothers in villages and UCs level and equipped them with incentive-based programming
	Integrated Healthcare Services	Strengthen healthcare systems to provide integrated health services that address malnutrition and related health issues. Improve access to healthcare facilities, especially in rural or underserved areas, to ensure timely diagnosis and treatment of malnutrition-related conditions. This can involve training healthcare workers, establishing nutrition counseling services, and integrating nutrition screening into routine healthcare visits for children.
	Community Education and Outreach	Launch community-based educational campaigns to raise awareness about proper nutrition, hygiene, and sanitation practices. Empower caregivers with knowledge about balanced diets, the importance of breastfeeding, proper infant and child feeding practices, and hygiene measures to prevent illnesses that contribute to

		malnutrition. Utilize local community leaders and influencers to disseminate information effectively.
	Focus on Preventive Healthcare	Emphasize preventive healthcare interventions by providing access to clean water, sanitation facilities, and hygiene education. Improving access to clean water sources and sanitation facilities can reduce the risk of waterborne diseases, ultimately preventing illnesses that contribute to malnutrition-related mortality
	Strengthen Antenatal Care Services	Despite good coverage of iron/folic acid supplementation, efforts are needed to enhance family planning knowledge and ensure continuous support from family members during pregnancy and lactation. Strengthen outreach programs to raise awareness about family planning options, encourage familial support, and educate on the importance of skilled delivery attendants to increase hospital deliveries.
	Improve Access to Healthcare Facilities	Address the geographical barriers by improving access to healthcare facilities within a 5 km radius. Implement strategies to reduce travel distances, possibly by establishing additional health facilities or mobile clinics, ensuring timely access to maternal and child healthcare services.
	Increase IFA Tablet Consumption/Compliance	Despite a majority consuming IFA tablets, a significant portion either does not consume them or consumes them partially. Implement targeted educational campaigns emphasizing the importance of consistent IFA tablet intake during pregnancy to address nutritional deficiencies.
Child Health	Enhance Child Health Interventions	Strengthen deworming campaigns to increase coverage among children aged 12-59 months. Improve documentation and awareness around measles vaccination to bridge the gap between card-based records and recall. Encourage broader coverage of Vitamin-A supplementation among children aged 6-59 months
	Diarrhea Management	Efforts should focus on increasing access to Zinc or ORS treatment for diarrhea among children to further reduce morbidity and mortality associated with diarrheal episodes.

Food Security and Livelihood	Enhance Food Security Programs	Develop and implement targeted food security initiatives focusing on the most affected populations experiencing severe hunger. These programs should aim to increase access to nutritious food through subsidized food distribution, food banks, or community gardens, especially in areas with high reported food insecurity.
	Nutrition Education and Support Program	Establish community nutrition programs that provide practical training and support for women to diversify their diets, emphasizing the importance of consuming a variety of nutrient-rich foods for overall health.
	Support Income Generation and Livelihood Opportunities	Develop and strengthen programs that provide economic support, vocational training, and income-generating activities to vulnerable communities. Empowering individuals to earn a sustainable income can mitigate food insecurity by enhancing their purchasing power for food and other essential needs
	Strengthen Safety Nets and Social Support	Expand social safety net programs such as BISP to targeted households facing severe food insecurity. Strengthen community-based support systems to provide aid to those struggling to cope with food insecurity.
		Design programs that help communities build resilience against food insecurity by promoting income-generating activities, livelihood diversification, and skills training to create alternative sources of income and reduce dependency on a single livelihood
	Monitoring and Evaluation	Initiate district level nutrition strategies and timely implementation is essential Establish a robust monitoring and evaluation system to track the effectiveness and impact of food security programs regularly. Continuous assessment and feedback mechanisms will help in refining strategies and addressing evolving challenges effectively.
	Enhancing Water Access and Infrastructure	Water is accessible; however, the quality of water is a challenge and need community and district administration to test and worked on improved water sources. Initiatives should aim to reduce this gender gap, possibly by introducing community water supply schemes that minimize the need for individual household collection.

Water, Sanitation, and Hygiene (WASH)		Target interventions toward the primary reasons for open defecation such as the absence of latrines, lack of lighting at night, and distance from latrines. This may involve infrastructure development for better lighting, constructing latrines, and providing support for households to build their own sanitation facilities.
	Improving Sanitation and Hygiene	Policy interventions should prioritize providing access to proper sanitation facilities and promoting behavior change through awareness campaigns, aiming to eliminate open defecation.
	Improving Water Quality and Treatment	There is a critical need for education campaigns and infrastructure development to promote water treatment practices. Implement programs that educate communities about water treatment methods and support the installation of water treatment facilities in households or communities.
	Soap Availability and Hygiene Promotion	Ensure consistent availability of soap in households by implementing measures to address the reported lack of soap. Launch hygiene education campaigns emphasizing proper hand washing practices to prevent diseases. Collaborate with local authorities and NGOs to distribute soap and educate communities about its importance in maintaining hygiene and preventing illnesses.

8. Annexures

8.1. Annex I: Sphere Standards CDR and U5DR Emergency Threshold Cut-offs by Region

Region	CDR Baseline	CDR Emergency Threshold	U5DR Baseline	U5DR Emergency Threshold
South Asia	0.22	0.40	0.46	0.90
East Asia and Pacific	0.19	0.40	0.15	0.30
Industrialised Countries	0.25	0.50	0.03	0.10
Developing Countries	0.22	0.40	0.44	0.90
Least developed countries	0.33	0.70	0.82	1.70
World	0.25	0.50	0.40	0.80

8.2. Annex II- Plausibility Report

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**5** (2.7 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.254)
Age ratio (6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.184)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (3)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (10)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (1.09)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.07)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.32)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.096)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**8** %

The overall score of this survey is 8 %, this is excellent.

8.3. Annex III Event Calendar

EVENT CALENDAR 2018 TO 2023 (SINDH)													
Month	2018		2019		2020		2021		2022		2023	
Jan			1 Jan New Year's Day Wheat sowing Season (Dec-Jan)	55	1 Jan New Year's Day 29 Jan Basant Panchami Wheat sowing Season (Dec-Jan)	43	1 Jan New Year's Day 06 january- 01 Jamad ul sani Wheat sowing Season (Dec-Jan)	31	1 Jan New Year's Day 06 january- 01 Jamad ul sani Wheat sowing Season (Dec-Jan)	19	1 Jan New Year's Day 26 Jan Basant Panchami Wheat sowing Season (Dec-Jan)	7
Feb			5 Feb Kashmir Day 10 Feb Basant Panchami Lady finger (Jan-Mar) Dera Jaat Water melon (Feb-July) Apple (Feb-July)	54	5 Feb Kashmir Day Nokeen Saal Lady finger (Jan-Mar) Water melon (Feb-July) Apple (Feb-July) 21 feb shivratri	42	5 Feb Kashmir Day 16 Feb Basant Panchami 14 Feb-1st Rajab Lady finger (Jan-Mar)	30	5 Feb Kashmir Day 01 rajab Lady finger (Jan-Mar) Water melon (Feb-July) Apple (Feb-July)	18	5 Feb Kashmir Day 01 shaban 15 Feb- Bargah Dera jat kunday	6
Mar			4 Mar Shivaratri 21 Mar Holi 23 Mar Pakistan Day 21 march Dulhandi Bilot Mela Rabi Corp Harvesting	53	10 Mar Holi 10 march Dulhandi 23 Mar Pakistan Day 23 Mar Shab e-Meraj Rabi Corp Harvesting 10 march dulhandi	41	11 march shivratri 29 Mar Holi 12 March Shab e-Meraj 15 March- 01 Shaban 23 Mar Pakistan Day 29 march dulhandi Rabi Corp Harvesting	29	18 Mar Holi 23 Mar Pakistan Day 01 MArch Shab e-Meraj 29 march ramzan 23 Mar Shab e-Meraj Rabi Corp Harvesting	17	23 Mar Pakistan Day 08 Mar Holi Rabi Corp Harvesting	5
Apr			Sikandar Mela 3 Apr Shab e-Meraj 21 April Ridvan 19 Apr Good Friday 20 Apr Shab e-Barat Rabi Corp Harvesting	52	12 Apr Easter Monday 13 april besakhi Sikandar Mela 09 Apr Shab-e-Barat 30 Apr Buddha Purnima Rabi Corp Harvesting	40	04 Apr Easter Monday 14 Apr 1st ramzan Sikandar Mela Rabi Corp Harvesting Bargah	28	01 shawal Eid ul fitar (holi) 30 April 1st shawal Rabi Corp Harvesting Sikandar Mela	16	09 Apr Easter Monday 01 ramzan Sikandar Mela Rabi Corp Harvesting	4
May			1 May Labour Day 18 May Buddha Purnima 6 may Ramadan start	51	1 May Labour Day 16 may Ramadan start Budha punima 22 May 23-24 May Eid-ul-fitr	39	1 May Labour Day 19 May Buddha Purnima 12-13 May Eid-Ul-Fitr (Holi) 14 May- 1st Shawal	27	1 May Labour Day 28 may - 01 zilqad 01-02 May Eid-Ul-Fitr	15	01 shawal eidul fitar Urs Mela	3
June			5 Jun Eid-ul-Fitr 6 Jun Eid-ul-Fitr Holiday 7 Jun Eid-ul-Fitr Holiday Summer vacation	50	-	38	12 June- 1st Zilqad	26	29 june 1st zilqad	14	01 Zilhajj Heavy rainfall Storm 27 june football tournament 29 june Eid ul azha	2
July			1 Jul 1 Bank Holiday Monsoon Heavy Rain	49	1 July 1 Bank Holiday Monsoon Heavy Rain 31 Jul Eid al-Adha	37	1 Jul 1 Bank Holiday Monsoon Heavy Rain 12 july -1st Zilhajj 21 July Eid Ul Azha	25	28 july 1st Moharram 1st week of July heavy rain 10 Jul Eid al-Adha Lumpy Skin Disease animal	13	28 july 10 Moharram Lumpy Skin Disease animal	1

August	14 Aug Independence Day 18 Aug Imran Khan Selected 22 Aug Eid al-Adha 23 Aug Eid al-Adha Holiday 24 Aug Eid al-Adha Holiday Monsoon Heavy Rain 28 Aug- Akbar Bugti death anniversary	60	12 Aug Independence Day 13 Aug Eid al-Adha Holiday 15 August Hob 14 Aug Eid al-Adha Day 4 15 August Mischin 24 Aug Janmashtami Monsoon Heavy Rain 28 Aug- Akbar Bugti death anniversary	48	1 Aug Eid al-Adha Holiday 2 Aug Eid al-Adha Holiday 11 Aug Jamnashtmi 14 Aug Independence Day 15 August Mischin 15 August Hob 29 Aug Ashura 30 Aug Ashura Holiday Monsoon Heavy Rain	36	14 Aug Independence Day 18 Aug Ashoora 15 August Mischin 15 August Hob 10 Aug- 1st Moharram Monsoon Heavy Rain	24	14 Aug Independence Day 27 august 1st safar 08 Aug Ashura 25 Aug flood 27 August- 1st Moharram 09 Aug Ashura Holiday Monsoon Heavy Rain 23 safar meethitikiyan (Tikray)	12	14 Aug Independence Day 27 august 1st safar 08 Aug Ashura 25 Aug flood 27 August- 1st Moharram 09 Aug Ashura Holiday Monsoon Heavy Rain 23 August Jammashtmi	0
Sept	3 Sep Janmashtami Sep 23 Pashtun cultural day 6 Sep Defence Day 21 Sep Ashura Sep 7 Khatam-e-Nobuwwat day 22 Sep Ashura Holiday	59	6 Sep Defence Day 9 Sep Ashura Sep 23 Pashtun cultural day 10 Sep Ashura Holiday Sep 7 Khatam-e-Nobuwwat day	47	6 Sep Defence Day Sep 23 Pashtun cultural day Sep 7 Khatam-e-Nobuwwat day	35	6 Sep Defence Day 28 Sep Chelum 09 Sep- 1st Safar Sep 23 Pashtun cultural day Sep 7 Khatam-e-Nobuwwat day	23	6 Sep Defence Day 25 sep 1st rabi-ul-awal 17 Sep Chelum Sep 23 Pashtun cultural day Sep 7 Khatam-e-Nobuwwat day	11		
Oct	17 Oct Durga Puja 19 Oct Dussehra 30 Oct Chelum Ghala Kishar 24 Oct Lateef Bhitai Urs	58	20 Oct Chelum 27 Oct Diwali/Deepavali 8 Oct Dussehra 13 Oct Lateef Bhitai Urs	46	8 Oct Chelum 23 Oct durga pooja 25 Oct Dussehra 30 Oct Eid Milad un-Nabi kharif Harvest season 1-3 Oct Lateef Bhitai Urs	34	20 Oct Birthday of Guru Ghala Kishar 27 Oct Diwali/Deepavali kharif Harvest season	22	3 oct durga pooja 5 oct dussehri 30 Oct Eid Milad un-Nabi 20 Oct rabi ul sani kharif Harvest season Ghala Kishar	10		
Nov	7 Nov Diwali/Deepavali 9 Nov Iqbal Day 21 Nov Eid Milad un-Nabi 23 Nov Guru Nanak's Birthday	57	9 Nov Iqbal Day 10 Nov Eid Milad un-Nabi 12 Nov Guru Nanak's Birthday	45	9 Nov Iqbal Day 14 Nov Diwali/Deepavali 28 Nov Giarhwin Sharief 30 Nov Guru Nanak's Birthday	33	9 Nov Iqbal Day 10 Nov Eid Milad un-Nabi 7 N0v- !st Rabiul sani	21	9 Nov Iqbal Day 14 Nov Diwali/Deepavali 26 Nov 1st Jamadi ul awal Rabi ul sani	9		
Dec	19 Dec Giarhwin Sharief 25 Dec Quaid-e-Azam Day Pakhtun Culture Day 31 Dec New Year's Eve 22 Dec Benazeer death Anniversary	56	19 Dec Giarhwin Sharief 25 Dec Quaid-e-Azam Day Pakhtun Culture Day 31 Dec New Year's Eve 22 Dec Benazeer death Anniversary Winter vacation	44	19 Dec Giarhwin Sharief 25 Dec Quaid-e-Azam Day Pakhtun Culture Day 31 Dec New Year's Eve 22 Dec Benazeer death Anniversary winter vacation	32	19 Dec Giarhwin Sharief 25 Dec Quaid-e-Azam Day Pakhtun Culture Day 31 Dec New Year's Eve 22 Dec Benazeer death Anniversary winter vacation	20	19 Dec Giarhwin Sharief 25 Dec Quaid-e-Azam Day Pakhtun Culture Day 31 Dec New Year's Eve 22 Dec Benazeer death Anniversary winter vacation Rabi ul Awal	8		

8.4. Annex IV Cluster control Form

Line list HH #	Order of Visit	Name of HH	First Visit Outcome 1 = completed 2 = partly completed 3 = refused 4 = absent*	Number of eligible children (6-59 months)	Number of eligible children Measured (6-59 months)	Number of children under 2 (0-23 months)	HH needs to be revisited Yes or No	HH Re-visited Yes or No	Second Visit Outcome (If necessary) 1 = completed 2 = part completed 3 = refused 4 = absent	Comments
	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									