SMART NUTRITION SURVEY

DISTRICT Dadu

Sindh Province

October, 2023

Acknowledgment

We would like to acknowledge all persons who participated in the SMART Nutrition Survey 2023. We express our special gratitude to all organizations, who were directly involved for their cooperation and support from the survey planning phase to completion.

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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
MPK	Mirpurkhas

2. Executive Summary

The SMART Nutrition Survey of Dadu 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 Dadu. 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 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, 43 clusters were selected for the survey.

Overall, the SMART Nutrition Survey of Dadu 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 the district.

Key findings of Nutritional status of Children and mothers

The SMART Nutrition Survey conducted in Dadu, in October 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 427 households were successfully surveyed, representing approximately 100% of the households visited. In terms of anthropometry, a total of 533 children (274 boys, 256 girls) were assessed for their nutritional status, Z-score for 05 children shows out of range and 1 child with no Z-Score available. Therefore, the result is based on 527 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 15.2%;** 15.6 % in males and 14.8% in females, indicating a very high level of malnutrition based on WHO standards[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

A total of **14.4% 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)** where approximately **80%** of the PLWs scored medium to low scores on the said indicator and only 20% scored high. The responses on the **Food Insecurity Experience Scale (FIES)** also depicts the causal routes where **53.4%** of the respondents experienced moderate and severe hunger.

The FIES indicator depicts the hunger and access to food in a community which is better in Dadu as compared to other 4[2] districts surveyed along with Dadu. In the other districts the FIES was poor in majority of the respondents which can be seen with the interrelated higher GAM rates which is a direct predictor of acute malnutrition.

The key indicator of **Minimum Dietary Diversity for 6–23 months (MDD)** shows that only **3.2%** 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 Dadu

Indicator	Finding
Demographic	
Total No. of HHs Assessed	430
% of under five children	21.6
Average Number of Persons per Household	6.7
Nutrition Status of Children 6 – 59 Months	
Global Acute Malnutrition (WHZ) (<-2 z-score and/or oedema)	**15.2 % (11.6 - 19.6 95% C.I.)**
Male	15.6 % (10.8 - 21.8 95% C.I.)
Female	14.8 % (10.2 - 21.0 95% C.I.)
Severe Acute Malnutrition (SAM) WHZ (<-3 z-score and/or oedema)	4.4 % (2.7 - 7.1 95% C.I.)
Male	4.4 % (2.4 - 8.0 95% C.I.)
Female	4.3 % (2.3 - 7.7 95% C.I.)
Moderate Acute Malnutrition (MAM) WHZ (<-2 z-score and >=-3 z-score, no oedema)	**10.8 % (8.2 - 14.2 95% C.I.)**
Male	11.1 % (7.6 - 16.0 95% C.I.)
Female	10.5 % (6.6 - 16.3 95% C.I.)
Oedema	0.0%
GAM [MUAC] (< 125 mm and/or oedema)	12.0 %

[2] Jacobabad, Kambar Shahdadkot, Larkana, Mirpurkhas

Indicator	Finding
	(8.5 - 16.7 95% C.I.)
SAM [MUAC] **(< 115 mm and/or oedema)**	4.1 % (2.6 - 6.4 95% C.I.)
MAM [MUAC] **(< 125 mm and >= 115 mm, no oedema)**	7.9 % (5.4 - 11.4 95% C.I.)
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	19.5 % (15.3 - 24.6 95% C.I.)
Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	6.4 % (4.3 - 9.4 95% C.I.)
Stunting [HAZ] Prevalence of stunting (<-2 z-score) *Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)* *Prevalence of severe stunting (<-3 z-score)*	**36.0 %** **(30.3 - 42.1 95% C.I.)** *25.7 %* *(21.7 - 30.2 95% C.I.)* *10.3 %* *(7.6 - 13.8 95% C.I.)*
Underweight [WAZ] Prevalence of underweight (<-2 z-score)	**38.0 %** **(33.6 - 42.7 95% C.I.)**

Assessment of Dadu population through SMART Nutrition Survey in October 2023 revealed high rates of malnutrition among children aged 6 to 59 months, with 15.2%[3] affected by Global Acute Malnutrition (GAM) and 4.4% by Severe Acute Malnutrition (SAM). Stunting affected 36.0% of children, and 38.0% were underweight. GAM by MUAC 12.0 % (8.5 - 16.7 95% C.I.) and SAM by MUAC was 4.1 % (2.6 - 6.4 95% C.I.).

The prevalence of **underweight** among children aged 6-59 months was 38.0%, and alarming with severe underweight affecting 8.1% of the children. Boys are more at risk of malnutrition as compared to girls.

Stunting, an indicator of chronic malnutrition, was found in 36.0[4]% of the surveyed children. Boys had a slightly higher prevalence of stunting compared to girls, although the difference was not statistically significant.

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

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

[4] WHO Classification of Stunting <2.5%: very low, 2.5 to <10%: low, 10 to <20%: medium, 20 to <30%: high, ≥30%: very high

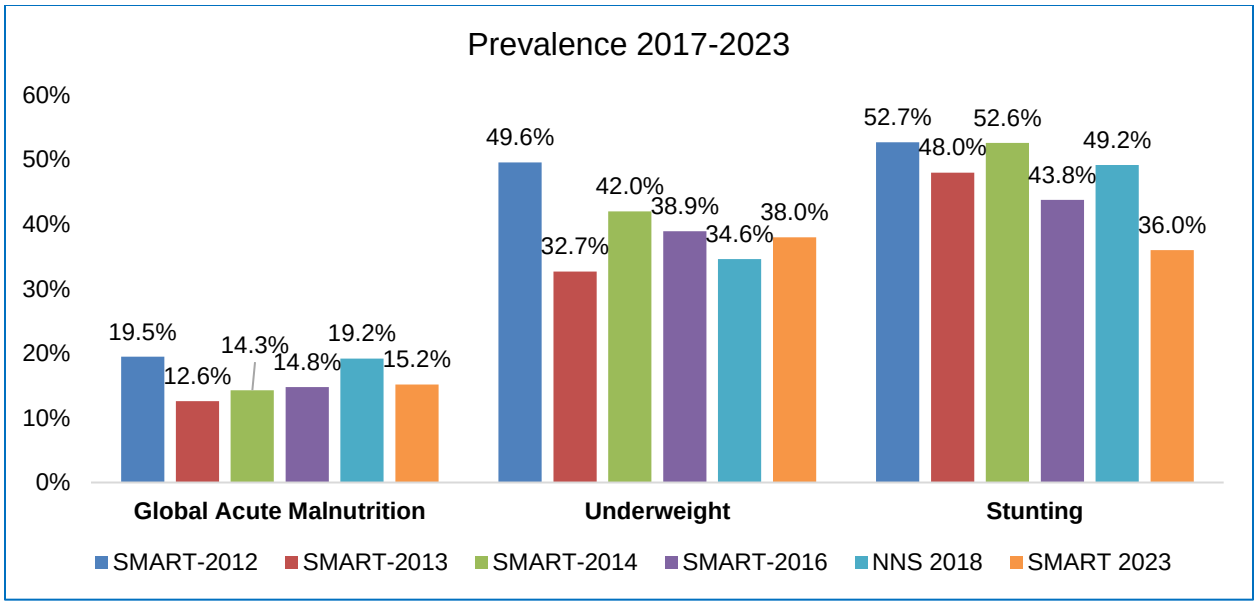

Figure 1. Malnutrition trends in last 10 years.

Comparing the chronological changes since 2012 through SMART survey 2023, it shows an improvement in the acute malnutrition rates from 19.5% when it was badly affected by the 2010-2011 floods to 15.2% in 2023 and a significant improvement in the stunting rates as well. Dadu district has received a significant level of humanitarian assistance since 2012 starting from the EU-WINS programmes which progressed to the EU-PINS programme through which it received consistent support of a complete package of CMAM along with food security and wash interventions coupled with nutrition behavior change modalities. The reduction in stunting rates in particular from 52.7% in 2012 through 36% in 2023 is evidence of the positive impact of a long term multisectoral intervention where these findings can be capitalized for other parts of the country as a lesson learnt and evidence generated.

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. Based on the information collected, the overall **Crude Death Rate (CDR) is 0.30%, with a range of CI 0.11 – 0.80%.** 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) was 0.18% 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.

Overall, the mortality rates, including the Crude Death Rate and Under 5 death rate (CDR (0.30) and U5DR (0.18), 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.

Conclusions and recommendations

These findings highlight the need to sustain the package of multisectoral interventions for Dadu and keep the momentum going to help bring the GAM prevalence below the WHO emergency thresholds and stunting as well to be reduced further significantly. The major factors contributing to acute malnutrition include inadequate quality and quantity of food, high food insecurity, hygiene practices and sanitation coverage. Also, high rates of diarrhea, maternal nutrition and poor health seeking behavior is high. The EU interventions related to nutrition sensitive models is most likely to be the high impact interventions that has resulted in significant reduction in stunting over the past 10 years in Dadu which is not present in the results of the other surveyed districts.

The malnutrition trends in all forms are fluctuating from last 10 years, due to several past shocks like rain floods, inflation and damage to agriculture land. Which reduced the households access to food and resilience to shocks. Additionally, mother education is still very low as compared to other districts and need immediate attention to improve mother education through integration with health and nutrition programs.

Addressing malnutrition efforts working has to be mainstreamed into food security, and WASH interventions to prevent the incident cases can help ensure access to diverse food for women and children as well as safe water and hygienic environment new cases of malnutrition. Targeted efforts should focus on prevention and treatment intervention, addressing household’s financial constraints to access quality food. Additionally, addressing the high prevalence of wasting, stunting, and underweight requires comprehensive district and community focused strategies that address the underlying causes of malnutrition, such as inadequate feeding practices, food insecurity, and socioeconomic factors.

Urgent interventions are thus needed, including therapeutic feeding programs, provision of nutrient-rich foods, and improved access to healthcare services. Addressing malnutrition and stunting is crucial to reduce mortality risk, support healthy growth and development, and secure a better future for these children. Collaboration between government, healthcare providers, development partners, NGOs, and communities are essential for effective implementation and monitoring of interventions.

3. Introduction

3.1. Dadu – district at the glance

Dadu is one of the districts in Sindh, Pakistan with a population of 1,550,180[5], of which 795,700 were males and 754,480 were females. The rural population was 1,166,984 (75.27%) and the urban population 383,406 (24.72%). The literacy rate is 47.26%: 57.92% for males and 36.02% for females. The district is located in the west of Sindh province and is bounded on the north by district Qambar Shahdadkot, on the east by district Larkana and Shaheed Benazirabad, on the west by Khirther range of mountains and Baluchistan, and on the south by district Jamshoro.

The majority religion is Islam, with 99.37% of the population. Hinduism (including those from Scheduled Castes) is practiced by 0.58% of the population. Sindhi was the predominant

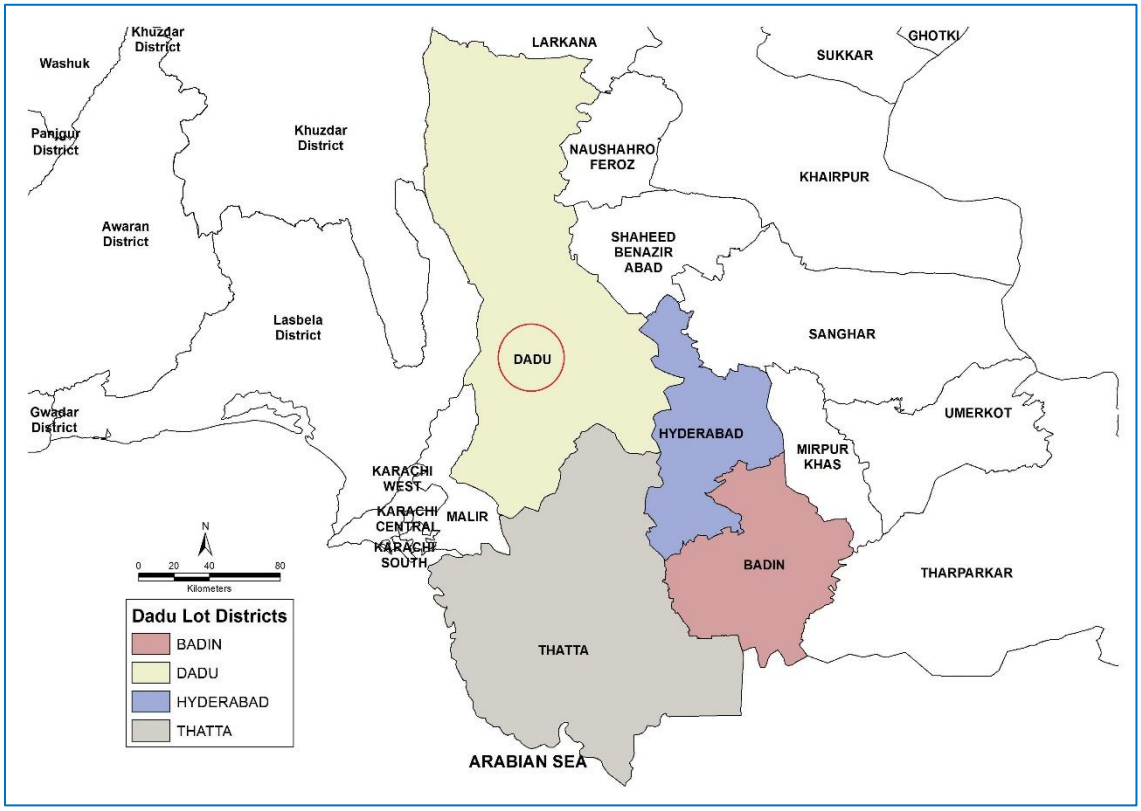

Figure 2: Maps of District Dadu[6]

3.2. Demography and Population

Dadu district lies in 260 6’ 35” to 270 26’ 20” north latitude and 670 7’ to 680 2’ 17” east longitude. River Indus flows north to South along the eastern boundary of the district. Manchar is a huge lake of

[5] Pakistan Census 2017
[6] https://www.usf.org.pk/

the district and is used for fish breeding and as a natural reservoir. The Khirthar National Park, located in district Dadu, is reserved for wildlife preservation. The temperature, in summers, is recorded between 85F to 90F. Dadu, Mehar, Khairpur Nathan Shah, and Johi talukas form an extremely hot belt due to the direction of sea breezes from west to east over.

3.3. Economy & Livelihoods

Dadu is one of the major districts floods 2022 affected and still some of the areas are facing challenges to access health and nutrition services. After successful health nutrition interventions, still the overall nutrition status of the children, women of reproductive age in Dadu is a challenge, and the situation in rural union councils are more vulnerable. Dadu district is situated in arid and semi-arid zone of Pakistan, and hence prone to drought. The people of Dadu are mostly dependent on rainwater, which recharges their ponds and wells. The easy access to potable/safe drinking water is one of the basic human needs. Also, the poor people of drought affected areas have adopted multiple economic activities to survive and majority of them is mainly dependent on agriculture and livestock rearing. According to IPC 2022 (Dadu), the main shocks affecting the areas have been drought during the first half of 2022, unprecedented 2022 monsoon rains/flooding since July 2022, a high inflation rate, reduced employment opportunities, reduced crop production, and livestock diseases affecting purchasing power and access to food.

3.4. Survey Justification

The national nutrition survey NNS 2018 indicated (19.2%) Global Acute Malnutrition (GAM) prevalence of under 5-year children of district Dadu. There was a high risk of further deterioration of health and nutrition status, access, and availability of nutrition services due to flood 2022 and 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 Dadu, decided to conduct a SMART Nutrition Survey in collaboration with UNICEF and with support of Himmat 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, Director General Health Services Sindh 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
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.

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 Dadu district included both rural and urban population; 79% rural and 21% urban. 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 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 (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 Dadu is estimated at 19.2% (NNS-2018). 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 389, 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 0.2 deaths per 10,000 populations per day, and a design effect of 1.5 was applied based on SMART recommendations for cluster sampling. The average household size was 7. The anticipated non-response rate was 3%, resulting in a calculated number of individuals (1452) and households (214) 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 2: Parameters and rationale

Anthro / Mortality Parameters	Updated parameter	Rationale
Estimate Prevalence	19.2%	Global Acute Malnutrition (GAM)-% (NNS 2017-18)
Desired Precision	5	As per SMART Manual Suggested
Design Effect	1.5	A design effect of 1.5 will be 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)	389	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	**430**	**Calculated by ENA software**
Estimate death rate	0.20	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	96	July 19, 2023 /1st Day of Muharam.
Average HH Size	7	Based on Census Data 2017
% of NRR	3	Anticipated non response rate
Population to be included	1452	Calculated by ENA software
Household to be included	214	Calculated by ENA software
Total Clusters	43	10 HH/Day/team

4.3. Selection of Clusters and households

Two stage sampling procedures were 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 clusters were mapped and line listed. The selection of households was then done through a systematic random sampling technique.

In some cases, the 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.

4.4. Training of Field Data Collection Teams

The training was conducted in District Dadu 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. Additionally, trained, and experienced data collectors from the previous districts Jacobabad, Mirpurkhas and Larkana were involved to ensure quality data collection.

The training was conducted over 3 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 Dadu district team collectively obtained 123/315 (39%) marks in the pre-test, while in post-test they scored 249/315 (79.4%) marks, showing an overall improvement of 40%. The capacity enhancement of participant's anthropometric measurement skills was also assessed through standardization tests on training day 3. 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 and
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 daily basis and at multiple levels.

At the field level, anthropometry, mortality and data submitted in cluster control forms in hard form was reviewed by the monitors before data entry by the DEOs, for cleaning any logical errors. The plausibility analysis was then run by SMART Nutrition expert using ENA software and shared with AAH Regional Advisor for review and endorsement. The result of plausibility analysis was shared with AAH on daily basis before teams proceeded to the next clusters.

Feedback 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 joint monitoring team of UNCEF Sindh Provincial Team, 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 districts Larkana and Mirpurkhas for SMART Nutrition survey were taken onboard in district Dadu. Training on anthropometric techniques and basic concepts of SMART survey were delivered by SMART experts. Standardization Test-ST was conducted on Day-3, to evaluate the performance of the data collectors.

4.8. Monitoring and Supportive Supervision

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

5. Survey Findings

5.1. Household Characteristics and Demographic Profile

SMART Nutrition Survey in Dadu covered a total of 427 households. All of these households were successfully surveyed, which accounts for approximately 100% of the total households visited.

Table 3. Achieved Sample Size of the SMART Survey in Dadu

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%	100%	137%	583	533	248

5.2. Nutritional status of children 6-59 months

Exclusion of z-scores from observed mean SMART flags: WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3. The survey received an excellent overall plausibility score of 10%, showcasing the high quality of the data collected. Few data points (0.9% for WHZ, 1.3% for HAZ, and 0.4% for WAZ) raised concerns according to SMART standards. 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 age groups 54-59 were slightly underrepresented and the remaining age groups were well represented as compared to the normal age distribution advised by WHO. The main reason behind this under representation is older age children are in school during the time of the survey.

The overall sex ratio was 1.06 (with a p-value of 0.516) which is within the acceptable range (0.9 – 1.1). This means, survey data is passably representative of boys and girls.

Table 4. Age distribution of the sample size

Age	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	58	43.0	77	57.0	135	25.3	0.8
18-29	70	55.6	56	44.4	126	23.6	1.3
30-41	53	44.2	67	55.8	120	22.5	0.8
42-53	58	58.0	42	42.0	100	18.8	1.4
54-59	35	67.3	17	32.7	52	9.8	2.1
Total	274	51.4	259	48.6	533	100.0	1.1

The prevalence of Global Acute Malnutrition (GAM) in District Dadu based on weight for height z-score/and or oedema was 15.2% (11.6 – 19.6 95% C.I), and the prevalence of Severe Acute Malnutrition (SAM) was 4.4% (2.7 – 7.1 95% C.I.). The overall GAM[7] prevalence is indicative of very high malnutrition based on the WHO standards. GAM analysis of gender shows no significant difference in malnutrition among both groups (p-value: <0.835), are at similar risk of malnutrition with a prevalence of 15.6 % (10.8 – 21.8 95% C.I.) boys, and 14.8% (10.2 – 21.0 95% C.I.) girls respectively.

Table 5: Prevalence of acute malnutrition based on (Wasting) weight-for-height z-scores (and/or oedema) and by Boys vs Girls

	All n = 527	Boys n = 270	Girls n = 257	P value

[7] 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)

Prevalence of global malnutrition (<-2 z-score and/or oedema)	(80) 15.2 % (11.6 - 19.6 95% C.I.)	(42) 15.6 % (10.8 - 21.8 95% C.I.)	(38) 14.8 % (10.2 - 21.0 95% C.I.)	0.835
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(57) 10.8 % (8.2 - 14.2 95% C.I.)	(30) 11.1 % (7.6 - 16.0 95% C.I.)	(27) 10.5 % (6.6 - 16.3 95% C.I.)	0.848
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(23) 4.4 % (2.7 - 7.1 95% C.I.)	(12) 4.4 % (2.4 - 8.0 95% C.I.)	(11) 4.3 % (2.3 - 7.7 95% C.I.)	0.957

*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, wasting was more prevalent in 6-17 months children followed by 18-29 months children with the second highest prevalence of wasting.

Table 6: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		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.**	**%**
6-17	134	9	6.7	27	20.1	98	73.1	0	0.0
18-29	124	9	7.3	15	12.1	100	80.6	0	0.0
30-41	119	1	0.8	7	5.9	111	93.3	0	0.0
42-53	98	2	2.0	5	5.1	91	92.9	0	0.0
54-59	52	2	3.8	3	5.8	47	90.4	0	0.0
Total	527	23	4.4	57	10.8	447	84.8	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. 5.1% marasmus cases found without clinical presence of oedema.

Table 7: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 27 (5.1 %)	Not severely malnourished. 505 (94.9 %)

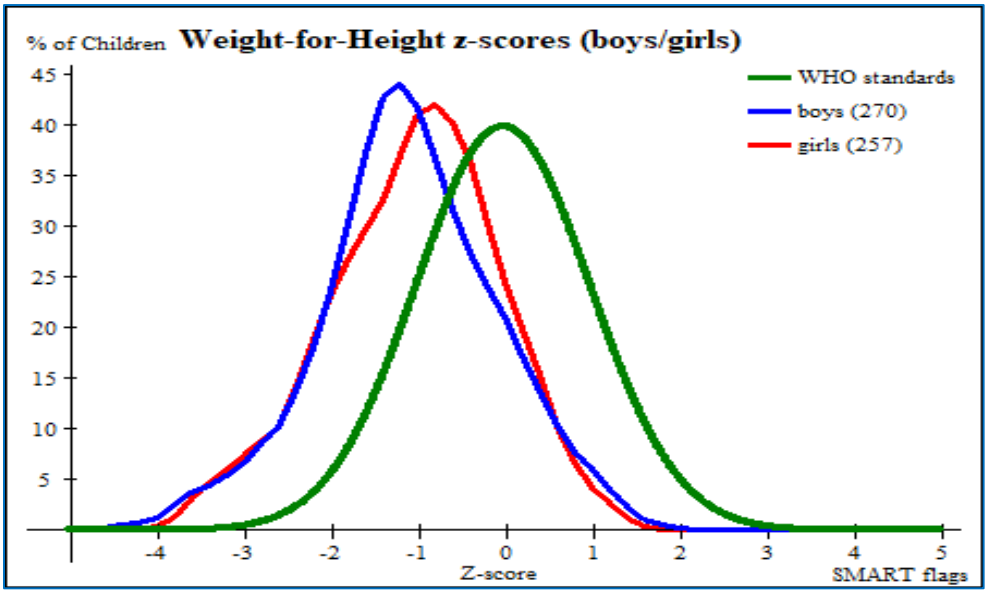

Figure 3: Gaussian Curve Weight-for-Height z score

The above figure shows the comparison of nutrition status of the 6 to 59 months in district Dadu and the reference population. The green curve represents the reference population while the red & blue curve represents the girls and boys surveyed in population, respectively. 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 12.0%. The prevalence was higher among boys (12.4%), as compared to girls (11.6%); however, this difference was not statistically significant (p=0.812).

Table 8: Prevalence of Acute Malnutrition (Wasting) by Boys vs Girls Based on MUAC cut offs (and/or oedema)

	All n = 533	Boys n = 274	Girls n = 259	P value
Prevalence of global malnutrition (< 125 mm and/or oedema)	(64) 12.0 % (8.5 - 16.7 95% C.I.)	(34) 12.4 % (8.0 - 18.7 95% C.I.)	(30) 11.6 % (8.0 - 16.4 95% C.I.)	0.812
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(42) 7.9 % (5.4 - 11.4 95% C.I.)	(24) 8.8 % (5.3 - 14.2 95% C.I.)	(18) 6.9 % (4.4 - 10.9 95% C.I.)	0.474
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(22) 4.1 % (2.6 - 6.4 95% C.I.)	(10) 3.6 % (2.1 - 6.3 95% C.I.)	(12) 4.6 % (2.6 - 8.0 95% C.I.)	0.534

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 below. Severe and moderate wasting was more prevalent in 6-17 months children than other age group. While the ratio of moderate wasting is also high in children aged 18-29 months.

It is a usual pattern proven from this survey as well as the other 4 surveys and the findings of NNS 2018 that the majority of acute malnutrition burden lies in the age of 6 months through 2 years after which any losses in the nutrition status becomes irreversible. The dietary diversity scores at the age of 6-8 months (MDD-**3.2%)** are also poor in this age groups which calls for a heavy time, resource investment and programmatic focus in MIYCF interventions to prevent this peak of growth faltering and flag the 6-24 months period as the most critical phase that determines the burden of the overall acute malnutrition. Another important correlation to make in this case is that high rates of wasting in 6-17 months age predicts the nutrition status as they enter the linear growth spurt after the age of 18 months. To support this hypothesis, it can be clearly seen to the highest caseload of severe wasting (15.1%) found in the same sample size was for the age group sample of 18-29 months old children. This means that investment on complementary feeding, disease prevention, dietary diversity, care practices after the age of 6 months will not only cap the peak of wasting within this age group while it was also preventing the peak of stunting usually observed after 18 months of age.

Table 9: Prevalence of acute malnutrition by age groups, based on MUAC cut off and/or oedema

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	135	13	9.6	23	17.0	99	73.3	0	0.0
18-29	126	7	5.6	16	12.7	103	81.7	0	0.0
30-41	120	1	0.8	2	1.7	117	97.5	0	0.0
42-53	100	1	1.0	0	0.0	99	99.0	0	0.0
54-59	52	0	0.0	1	1.9	51	98.1	0	0.0
Total	533	22	4.1	42	7.9	469	88.0	0	0.0

5.6.Prevalence of Combined Global Acute Malnutrition (cGAM)

The table below presents the prevalence of combined Global Acute Malnutrition (cGAM) 19.5 % (15.3 – 24.6 95% C.I.), and Severe Acute Malnutrition (SAM) 6.4 % (4.3 – 9.4 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 533, out of which 274 are boys and 259 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 higher among boys compared to girls, but the difference is not statistically significant for SAM as indicated by the P-values (0.368).

Table 10: Prevalence of combined GAM and SAM based on WHZ and MUAC cut offs (Boys vs Girls)

	All n = 533	Boys n = 274	Girls n = 259	P value
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(104) 19.5 % (15.3 - 24.6 95% C.I.)	(55) 20.1 % (14.7 - 26.8 95% C.I.)	(49) 18.9 % (14.0 - 25.1 95% C.I.)	0.768
Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	(34) 6.4 % (4.3 - 9.4 95% C.I.)	(20) 7.3 % (4.6 - 11.5 95% C.I.)	(14) 5.4 % (3.3 - 8.8 95% C.I.)	0.368

*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 11: Distribution of children according to criteria for combined GAM and SAM

	GAM		SAM	
	no.	**%**	**no.**	**%**
MUAC	24	4.5	11	2.1
WHZ	40	7.5	12	2.3
Both	40	7.5	11	2.1
Edema	0	0.0	0	0.0
Total	104	19.5	34	6.4

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

Underweight is defined as low weight for age relative to 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 Dadu was 38.0% (33.6 – 42.7 95% C.I.), while those who were severely underweight were 8.1% (5.9 – 11.0 95% C.I.). Analysis by sex shows significant differences in boys and girls; boys are at slightly higher risk of malnutrition with a prevalence of 41.9% (35.2 – 48.9 95% C.I.), and 34.0% (28.3 – 40.1 95% C.I.) respectively.

Table 12: Prevalence of underweight based on weight-for-age z-scores by Boys vs Girls

	All n = 531	**Boys** n = 272	**Girls** n = 259	**P value**
Prevalence of underweight (<-2 z-score)	(202) 38.0 % (33.6 - 42.7 95% C.I.)	(114) 41.9 % (35.2 - 48.9 95% C.I.)	(88) 34.0 % (28.3 - 40.1 95% C.I.)	0.084
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(159) 29.9 % (26.0 - 34.2 95% C.I.)	(87) 32.0 % (25.9 - 38.7 95% C.I.)	(72) 27.8 % (23.2 - 32.9 95% C.I.)	0.298
Prevalence of severe underweight (<-3 z-score)	(43) 8.1 % (5.9 - 11.0 95% C.I.)	(27) 9.9 % (6.7 - 14.5 95% C.I.)	(16) 6.2 % (3.9 - 9.7 95% C.I.)	0.119

The table given below presents the prevalence of underweight by age, based on weight for age z-scores. As shown in Table 13 the highest proportion of severe underweight children was in age group 18-29 months (12.9%), followed by 7.7% in 54-59 months age group. For moderate underweight, the highest proportion of children was in age group 6-17 months (36.3%).

Table 13: Prevalence of underweight by age, based on weight-for-age z-scores

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	135	9	6.7	49	36.3	77	57.0	0	0.0
18-29	124	16	12.9	42	33.9	66	53.2	0	0.0
30-41	120	7	5.8	27	22.5	86	71.7	0	0.0
42-53	100	7	7.0	28	28.0	65	65.0	0	0.0
54-59	52	4	7.7	13	25.0	35	67.3	0	0.0
Total	531	43	8.1	159	29.9	329	62.0	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 36 % (30.3 – 42.1 95% C.I.); findings suggested that this rate classified as very high[8]. Stunting was higher among boys 40.9% (33.7 – 48.5 95% C.I.) than girls 30.9% (24.5 – 38.0 95% C.I.). However, the p-value of 0.049 shows that difference was statistically significant.

Table 14: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 525	Boys n = 269	Girls n = 256	P value
Prevalence of stunting (<-2 z-score)	(189) 36.0 % (30.3 - 42.1 95% C.I.)	(110) 40.9 % (33.7 - 48.5 95% C.I.)	(79) 30.9 % (24.5 - 38.0 95% C.I.)	0.049
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(135) 25.7 % (21.7 - 30.2 95% C.I.)	(79) 29.4 % (23.9 - 35.5 95% C.I.)	(56) 21.9 % (17.2 - 27.4 95% C.I.)	0.055
Prevalence of severe stunting (<-3 z-score)	(54) 10.3 % (7.6 - 13.8 95% C.I.)	(31) 11.5 % (8.1 - 16.1 95% C.I.)	(23) 9.0 % (5.9 - 13.5 95% C.I.)	0.356

The prevalence of stunting in Dadu has significantly reduced over the past decades as there were several evidence pieces available for this district to draw a trend analysis where the stunting prevalence in 2012 has reduced from 52.7% through 36% in 2023, which is attributed to two long term integrated nutrition programs starting from EU-WINS in 2012 which transitioned to EU-PINS and the community was supported until 2023.

[8]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)

The table given below presents the prevalence of stunting by age, based on height for age z-scores. As shown in table 15, the highest proportion of severe stunting was in 18-29 months old children (15.4%), followed by 10.8% in 30-41 months age group. For moderate stunting, the highest proportion of children was in age groups of 30-41 months and 18-29 months, 30.0% and 26.8%, respectively.

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

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	133	11	8.3	33	24.8	89	66.9
18-29	123	19	15.4	33	26.8	71	57.7
30-41	120	13	10.8	36	30.0	71	59.2
42-53	98	9	9.2	22	22.4	67	68.4
54-59	51	2	3.9	11	21.6	38	74.5
Total	525	54	10.3	135	25.7	336	64.0

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 16: 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	527	-1.07±0.98	1.61	1	5
Weight-for-Age	531	-1.77±0.89	1.17	0	2
Height-for-Age	525	-1.84±0.92	1.97	1	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 prevalence was 0.00%. Results also imply that severe overweight findings were not found in any of the group.

Table 17: Prevalence of overweight based on WHZ and by sex (no oedema)

	All n = 527	Boys n = 270	Girls n = 257
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, stunting, and underweight is substantial, with stunting being classified as "very high" in severity; while underweight and wasting in “Very High” category.

Table 18: Severity of malnutrition among children aged 6-59 months

Indicators	Prevalence	Severity
Wasting [WHZ]	15.2%	**Very High**
Overweight [WHZ]	0.0%	**Very low**
Stunting [HAZ]	36.0%	**Very High**
Underweight [WAZ]	38.0%	*** Alarming**

The Findings of survey are explained as under:

Wasting[9]: 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 15.2% suggests a concerning level of malnutrition in terms of wasting considered Very High. Additionally, Combined Global Acute Malnutrition (cGAM) stands at 19.5% (15.3 – 24.6 95% C.I.), and Severe Acute Malnutrition (SAM) 6.4 % (4.3 – 9.4 95% C.I.).

Combined Global Acute Malnutrition (cGAM): The prevalence of combined Global Acute Malnutrition (cGAM) stands at 19.5 % (15.3 – 24.6 95% C.I.), The prevalence was slightly higher in boys than in girls though not statistically significant.

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.

[9] <2.5%: very low, 2.5 to <5%: low, 5 to <10%: medium, 10 to <15%: high, ≥15%: very high

Stunting[10]: The data indicates that a considerable percentage (36.0%) 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.

Underweight: The prevalence of underweight children is 38.0%, indicating a Critical level of under nutrition in terms of weight-for-age. The severity is categorized as "Alarming," which needs to be addressed.

These findings underscore the need for interventions and policies aimed at addressing

malnutrition and improving the nutritional status of children in this age group.

5.1. Retrospective Mortality

Based on the information collected, the overall **Crude Death Rate (CDR) is 0.30%,** with a range of CI 0.11 – 0.80%. This means that out of the total population, a small percentage of people have died within the 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) was 0.18% 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 (0.30) and U5DR (0.18) 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. Household level questions were asked to determine the cause of each death, under the broad categories of illness or injury/trauma. All deaths (100.0%) were caused by illness. Similarly, data shows that 100% of deaths occurred in current location.

[10] <2.5%: very low, 2.5 to <10%: low, 10 to <20%: medium, 20 to <30%: high, ≥30%: very high

Table 19: Retrospective Mortality

	Crude Death Rate (95% CI)	Design Effect	
Overall	**0.30 (0.11-0.80)**	**1.93**	
Sex			
Male	**0.37 (0.13-1.07)**	**1.37**	
Female	**0.23 (0.07-0.71)**	**1.0**	
Years			
Under 5 Children (0-4 years)	**0.18 (0.02-1.39)**	**1.02**	
Cause of death	**%**	**Location of death**	**%**
		1] In current location	**100**
3] Illness	**100.0**		

* (July 19, 2023 / 1st Muharram Ul Haram) was used as the beginning of the mortality recall period of 96 Days. All household members present during recall period adjusted for in and out-migration.

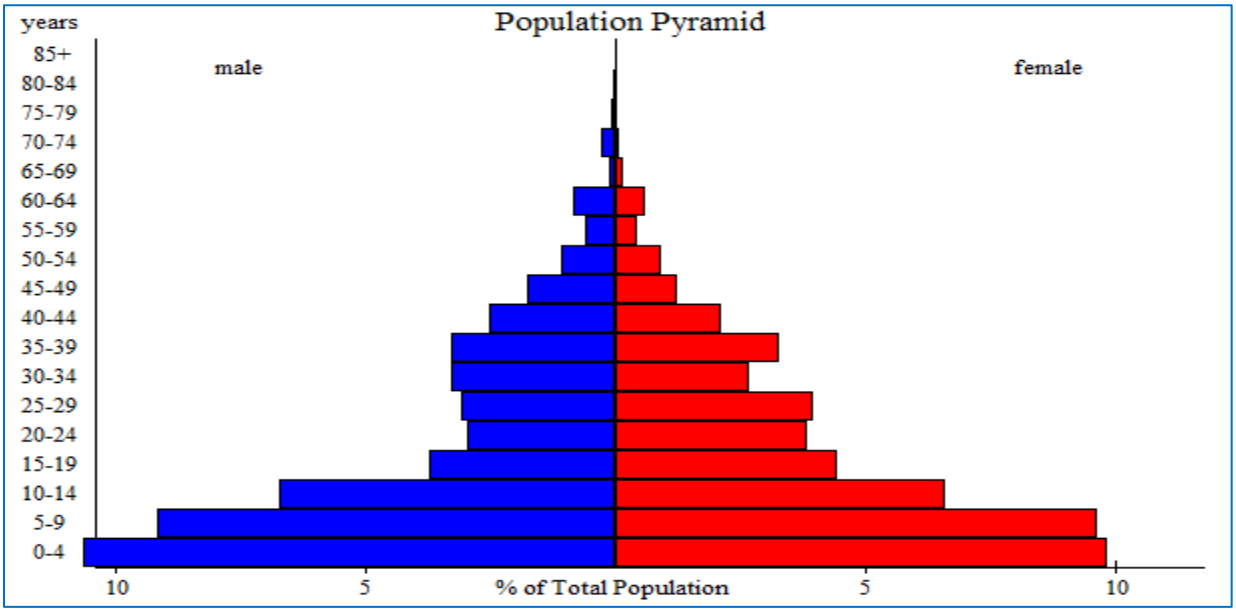

Figure 4 Population Pyramid of mortality data

5.2. Maternal Health and Nutrition Status

5.3. 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 status of women of reproductive age interviewed. It illustrates the percentages of women currently pregnant, breastfeeding, and those who are both pregnant and breastfeeding. 6.05% of women are currently pregnant (Table 20). MUAC measurement is frequently used as an indicator of nutritional status, and a measurement below 21.0 cm suggests a higher risk of malnutrition. Data indicates that among 208 pregnant and breastfeeding women, 14.4% were identified as malnourished in district Dadu based on MUAC criteria of <21.0cm.

Table 20. Physiological Status of Women of Reproductive Age and Malnutrition Status

Current Physiological status	N	n	%	CI 95%	
Currently lactating	496	178	35.89	31.66	40.28
Currently pregnant	496	30	6.05	4.12	8.52
Pregnant & lactating	496	2	0.40	0.05	1.45
Not Pregnant and Lactating	496	288	58.06	53.58	62.45
Women currently malnourished (MUAC <210 mm)	210	30	14.40	9.95	19.95

5.4. Women's Education Status

The table below shows the women's education status, among the 427 women responded, a substantial majority, approximately 86.9%, had never been to school. This indicates that a majority of the surveyed women did not have any formal education. only 1% had received primary education. This indicates that a small proportion had completed education up to the primary level, about 9.6% had completed higher secondary education which is alarming and needs special attention by the policy makers with smart commitments for girls' education. This percentage signifies a smaller subset of the surveyed population attained education up to the secondary level. A very small percentage, 1.9% had graduated, which indicates an alarming low illiteracy level in women in the district.

Table 21. Women's Education Status

Education Status	N	n	%
Primary	427	4	0.9%
Secondary	427	3	0.7%
Never been to School	427	371	86.9%
Higher Secondary	427	41	9.6%
Graduation	427	8	1.9%

5.5. Access to Antenatal Care (ANC) Services

Iron/Folic Acid Supplementation during Pregnancy:

Iron and folic acid are crucial supplements during pregnancy to prevent anemia and ensure proper fetal development. The data suggests that approximately 74.9% of the surveyed women received these supplements during their pregnancies. This is essential for maternal and fetal health.

Family Planning Methods Knowledge:

Family planning knowledge is vital for women's reproductive health. The data shows that around 78.2% of the surveyed women had knowledge about various family planning methods. Educating women about family planning can empower them to make informed decisions about their reproductive health.

Support from Family Members during Pregnancy-Lactation Period:

Support from family members plays a significant role in a woman's journey through pregnancy and lactation. The data indicates that 88.8% of the surveyed women felt supported by their family members during this critical period, which is very encouraging in the Dadu context, because improved family support can positively impact maternal mental and emotional health.

Place of Last Delivery:

The data categorizes the place of delivery into three categories: Dai/TBA, Hospital, and Home. It's observed that a low percentage of deliveries (0.2%) occurred with Dai/TBA, while a significant portion

(35.4%) took place in Private hospitals as compared to 47% in public health facilities. However, a considerable number of deliveries (11%) still happened at home. Access to skilled healthcare professionals during childbirth, as provided in hospitals, is crucial for safe deliveries and reducing maternal and infant mortality. The preference of home delivery is still common in district Dadu, and community only willing to visit hospitals in case of pre identified medical complication.

Access to Healthcare Facilities (HFs):

Access to healthcare facilities within a reasonable distance is crucial for maternal and child health. The data highlights that a high percentage (42%) of surveyed women had physical access to healthcare facilities within a distance of less than 5 km and 36.1% within 6-10 km. Conversely, a significant percentage (21.1%) had to access health facilities much farther greater than 10 kms, indicating potential challenges for those women in accessing timely healthcare services.

Recall of Maternal, Infant, and Child Health (MICYF) Key Messages:

The ability of women to recall key messages related to maternal, infant, and child health was relatively high at 88.7%. This suggests that a significant portion of the surveyed women retained important health-related information, however, the practices of the mothers are not much improved, which show that still the 1000 days' approach need special attentions to improve the MIYCF practices.

Sources of Key Messages:

The sources from which women received key messages regarding maternal and child health vary. Family friends 64.4%[11] emerged as the primary source, followed by doctors/nurses (21.8%). This indicates that informal social networks play a significant role in disseminating health-related information, while healthcare professionals also contribute significantly. However, the low percentage of health education received from any formal health sector is an eyeopener and calls for immediate attention to add health education within all health cadres' responsibilities. Secondly the reliance for health education on family and friends has a high probability of incorrect, falsified information which can be even more harmful than having no information.

[11] Family members circulate important messages on WhatsApp groups.

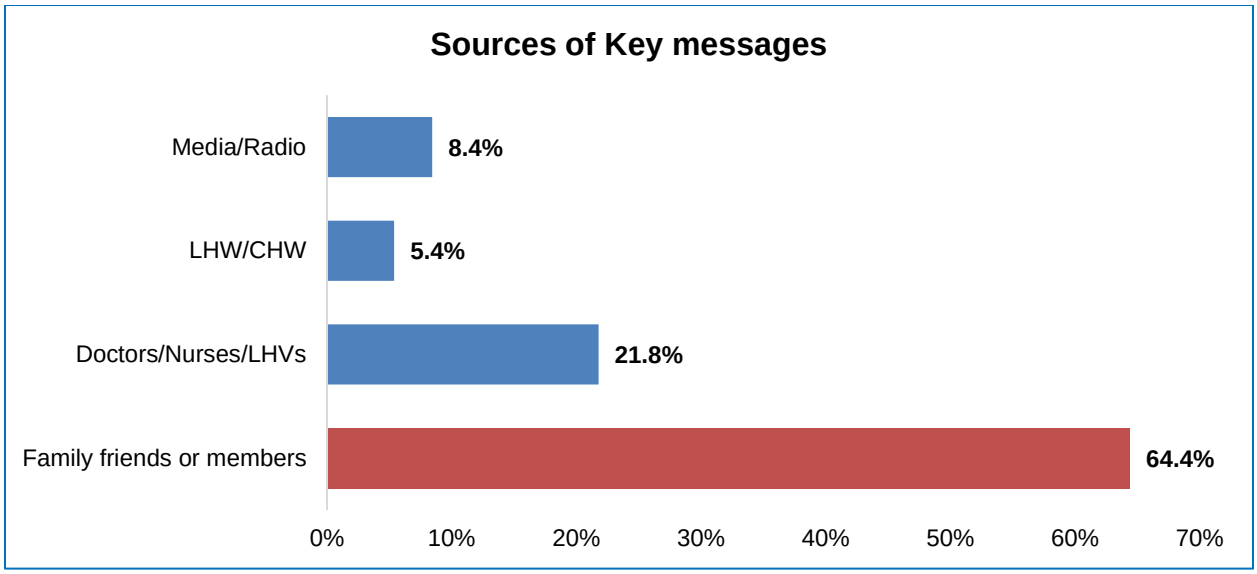

Figure 5. Sources of Key messages regarding MIYCF

In summary, the data underscores both positive aspects and areas for potential improvement in maternal healthcare services. While a majority received essential supplements during pregnancy and had knowledge about family planning, the data also reveals disparities in access to skilled care during childbirth and varying sources of health information. Addressing these disparities could help improve overall maternal and child health outcomes.

Table 22. Access to Maternal services

Access to Maternal services	N	n	%	95% CI	
Iron/folic acid supplementation during pregnancy	427	320	74.9%	0.72	0.80
Family Planning methods knowledge	427	234	54.8%	0.50	0.60
Women felt supported from family members during pregnancy-lactation period	427	141	33%	0.29	0.37
Place of last Delivery-Dai/TBA	427	1	0.2%	0.00	0.01
Place of last Delivery-Hospital (Private)	427	151	35.4%	0.31	0.40
Place of last Delivery-Hospital (Public)	427	202	47.3%	0.42	0.52
Place of last Delivery-Home	427	47	11.0%	0.08	0.14
Access to HFs <5 km	427	181	42.4%	0.38	0.47
>10 Km	427	90	21.1	0.17	0.25
Women can recall MICYF Key Messages	427	370	86.7%	0.83	0.90

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 14.5% strongly agreeing and 52% agreeing, totaling approximately 89.7% expressing some level of agreement, while a small percentage remained neutral (1.2%), and a lesser proportion disagreed (0.4% disagreed). Furthermore, a significant proportion, 31.9% did not know about the importance of IFA tablets.

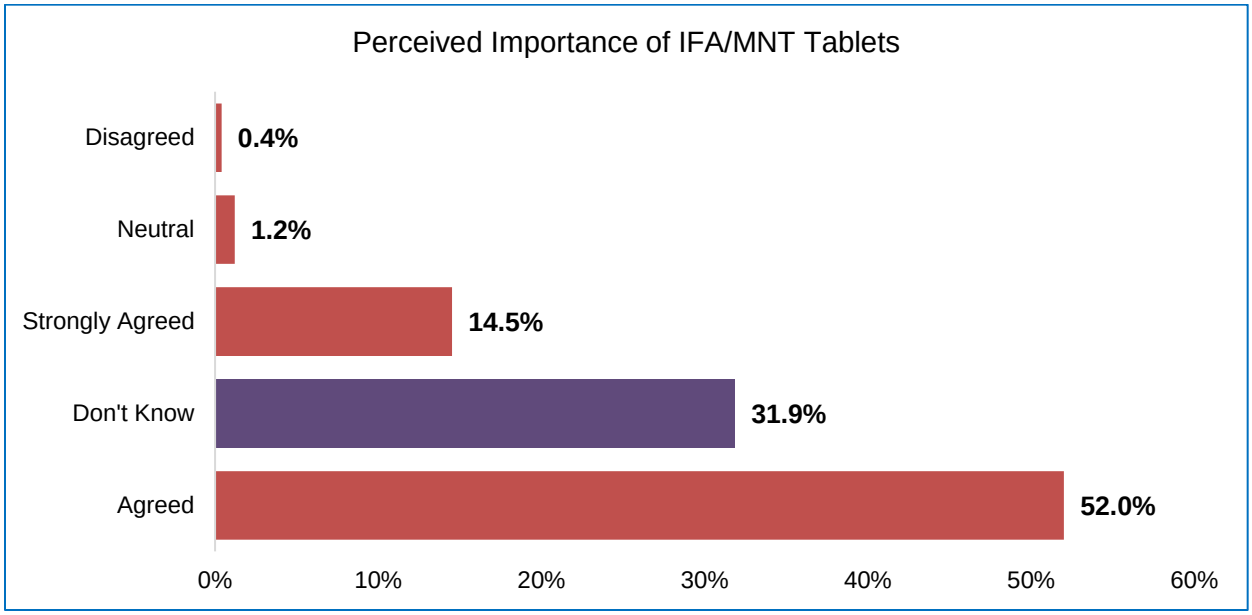

Figure 6. Perceived Importance of IFA/MNT Tablets

Consumption of IFA/MNT Tablets:

This data indicates the responses of individuals regarding their consumption of IFA tablets during a certain period, likely during pregnancy or as prescribed for health reasons. Below is a breakdown of the interpretations:

Don't Know (6%): This percentage represents individuals who are uncertain or have no awareness of whether they have consumed IFA tablets. It's possible that they might not have accurate information or might not remember their IFA tablet consumption status.

No (37.7%): This percentage signifies individuals who reported that they did not consume IFA tablets. Reasons for not consuming could vary, including forgetting, negligence, or possibly due to lack of access or understanding about the importance of IFA tablets during pregnancy or other health-related contexts.

Partially (5.8%): This percentage reflects individuals who have consumed IFA tablets partially, indicating that they might not have consistently followed the prescribed regimen or may have missed doses.

Yes (50.4%): This percentage represents individuals who reported consuming IFA tablets as prescribed or recommended. They have adhered to the regimen and have taken the supplements as advised, which is crucial for maternal and fetal health during pregnancy.

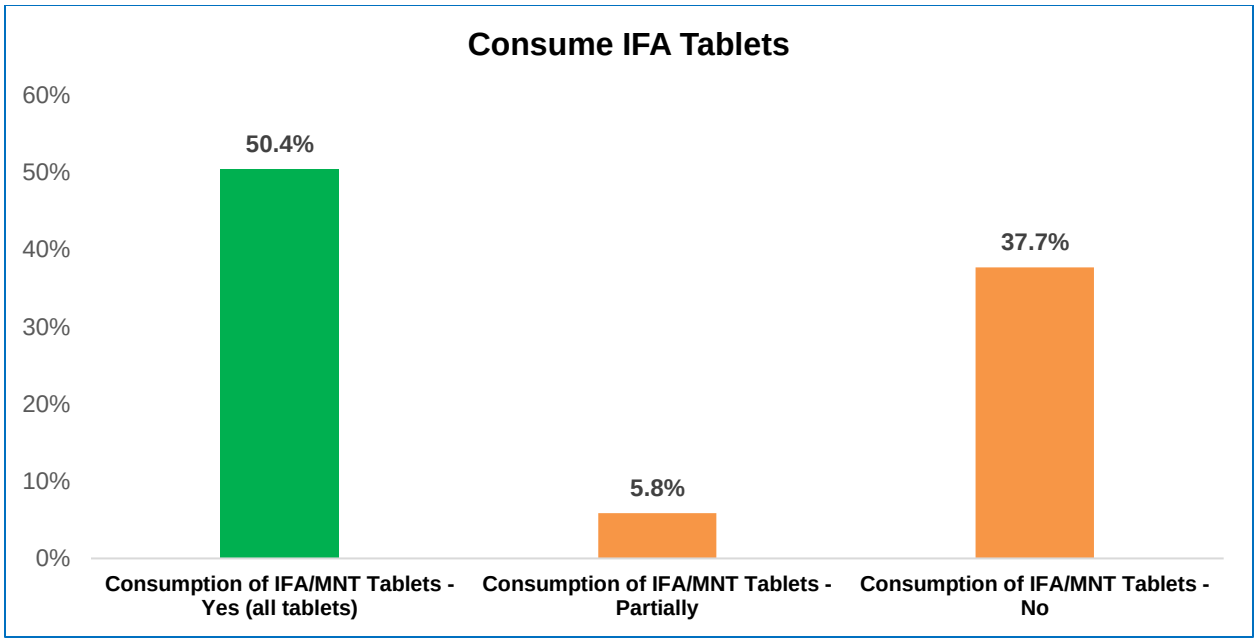

Figure 7. Consumption of IFA Tablets

Interpreting this data suggests that while a significant portion of the respondents have consumed IFA tablets as recommended, there's also a notable proportion who either did not consume them or only partially followed the prescribed regimen. This highlights potential areas for improvement in education, accessibility, and support mechanisms to ensure better adherence to IFA supplementation, particularly among pregnant women and individuals in need of such supplementation for health reasons. Comparing the IFA compliance data with the number of pregnant who received IFA, it shows that 50% of the total recipients (74.9%) of IFA utilized as per the recommended dosage which in actual turns out to be only 37.5% of the total Pregnant women only.

Amongst the respondents who reported not consuming IFA adequately the below figure 8 explains the main four reasons of not taking IFA supplementation during pregnancy or lactating, where the topmost is stock out, followed by perception of side effects. This provides a major recommendation for a better supply chain management of essential supplements at the health facility as every second women who received IFA did not get ample supplies of this essential commodity and could not complete the recommended dose which predisposes the pregnant women to anemia and predicts the adverse birth outcomes.

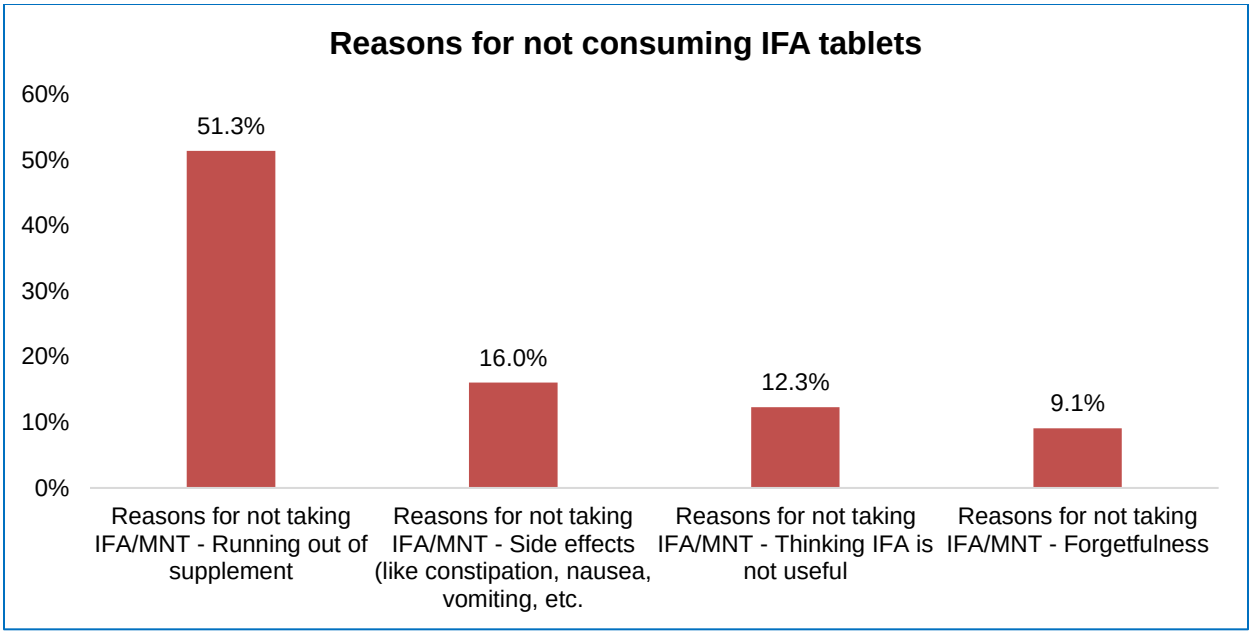

Figure 8. Reasons for not consuming IFA tablets

5.6. Child Immunization Services

Having the third-highest burden of child mortality and ranking third globally for the most under-vaccinated children, Pakistan contains 15% of its population under the age of five, which accounts for 50% of the mortality rate in this country. Every year, almost three million children miss out on an entire course of the most readily available vaccines, leaving them vulnerable to life-threatening diseases[12].

Table 23. Child Immunization status

Child Immunization					
Indicators	**N**	**n**	**Percent**	**95% CI Value**	
Deworming Coverage –Children 12-59 m	456	28	6.1%	0.04	0.09
Vitamin-A Coverage-Children 6-59 m	533	341	62.1%	0.57	0.66
Measles with Card 9-59 m	509	158	31.0%	0.27	0.35
Measles with Recall 9-59 m	509	267	52.5%	0.48	0.57
Diarrhea U5 Children	583	160	27.4%	0.24	0.31
Diarrhea Treatment with Zinc or ORS (U5)	160	27	16.9%	0.11	0.23

Deworming Coverage – Children 12-59 months: Out of 456 children within the age range of 12 to 59 months, only 6.1% received deworming treatment. Which indicate low deworming coverage, which is essential to prevent parasitic infections in children.

[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8684801/

Vitamin-A Coverage – Children 6 to 59 months: Among 533 children between the ages of 6 to 59 months, 62.1% received Vitamin-A supplementation. Vitamin-A supplementation is crucial for immune function and vision, however, the coverage of Vitamin-A in Dadu district is good.

Measles with Card 9-59 months: Out of 509 children aged 9 to 59 months, only 52.5% had documented measles vaccination cards. For the same age group (9 to 59 months), 31% of children were recalled by their caregivers to have received measles vaccination. This indicates a higher documentation rate than recall through vaccination cards.

Diarrhea Prevalence: The households surveyed were questioned regarding incidents of diarrhea in the past 15 days. Among the respondents, 73% either indicated that it was not applicable to them or did not report any instances of diarrhea. Notably, an average percentage (27%) of children under the age of 5 reported experiencing diarrhea during the recall period. This elevated figure may be attributed to the use of contaminated water and inadequate sanitation facilities resulting from the post-flood situation.

Diarrhea Treatment with Zinc or ORS 0-59 months: Out of 160 children aged 0 to 59 months with diarrhea, only 16.9% received treatment with Zinc or Oral Rehydration Solution (ORS). The confidence interval for this percentage ranges from 11.4% to 23.6%. Both Zinc and ORS are essential treatments for managing diarrheal episodes in children.

The data underscores gap in various aspects of child health and immunization. Coverage for Vitamin-A and essential interventions, including deworming, measles vaccination, and appropriate treatment for diarrheal episodes (utilizing Zinc or ORS), appears to be below the desired levels. There is a clear need for enhanced coverage and accessibility to critical interventions such as deworming, measles vaccination, and effective management of diarrheal

5.7. Family Planning knowledge and Practices, especially in the post flood situation

Mother's Knowledge Regarding Family Planning Method

Overall, these figures illustrate the distribution of responses from mothers regarding their knowledge about family planning methods. Approximately half of the mothers responded affirmatively (54.8%), signifying their familiarity with these methods. However, a noteworthy portion provided negative responses (42.2%), indicating a lack of knowledge, or expressed uncertainty. Furthermore, a very small proportion (3%) chose not to provide an answer.

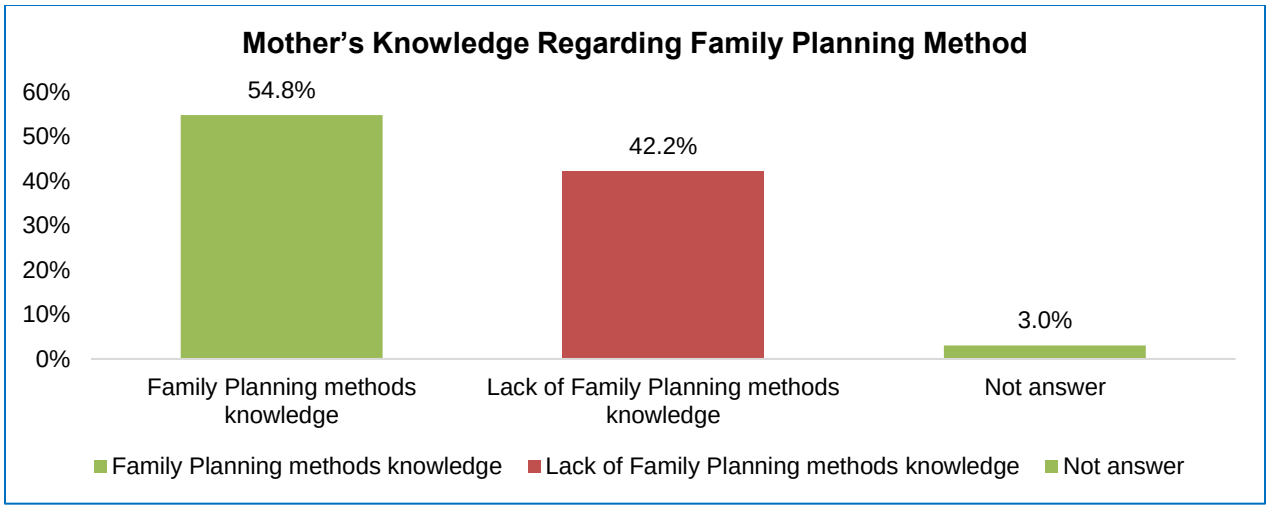

Figure 9. Mother's Knowledge Regarding Family Planning Method

Previous history of using Family Planning Method

The awareness of family planning is closely tied to contraceptive use in Dadu district. Among the 427 mothers surveyed, 59% reported using family planning methods. This is an encouraging sign, reflecting a commendable level of coverage. A significant portion (41%) reported not using any family planning method previously. This could signify a gap in education, access to services, or personal choices related to contraception.

The data showcases a diverse range of contraceptive methods utilized by the surveyed individuals, reflecting a variety of preferences and choices based on individual circumstances. Some methods like pills and injectables appear to be more commonly utilized, possibly due to ease of access, familiarity, or effectiveness.

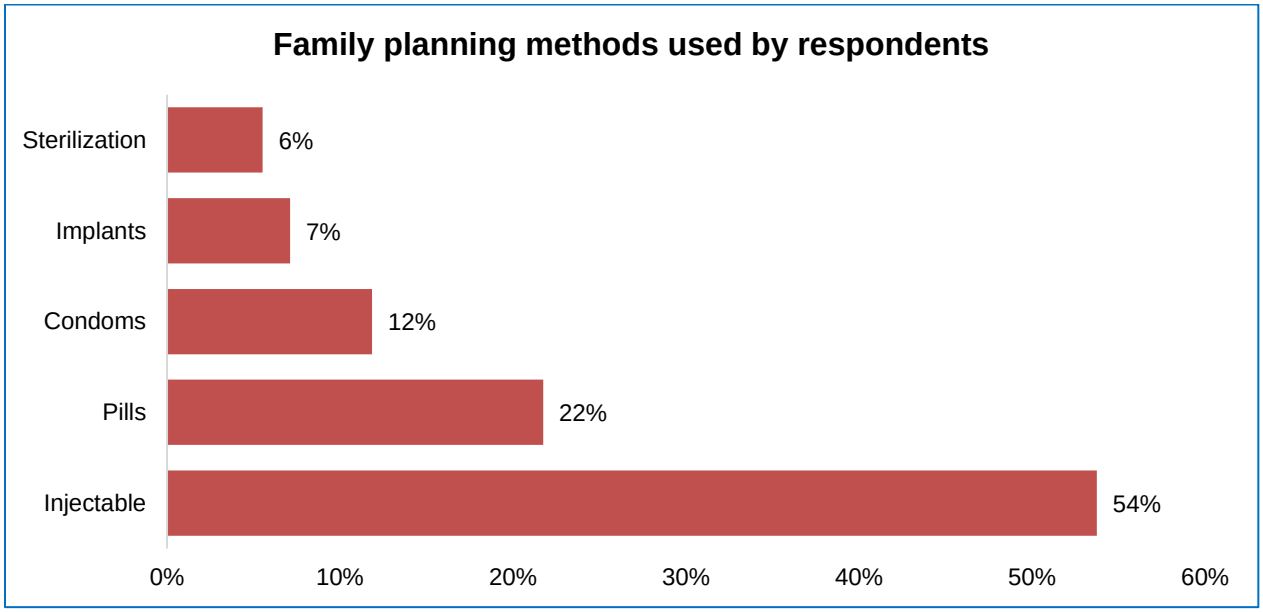

Figure 10. Trends of family planning methods used by respondents.

Condoms (12%): Condoms are a barrier method of contraception. Their usage might be influenced by preferences for protection against sexually transmitted infections (STIs) as well as contraception.

Implants (7%): Implants are small, flexible rods placed under the skin, offering long-term contraception. They are effective for several years and can be removed if desired.

Pills (22%): Contraceptive pills are hormonal medications taken daily to prevent pregnancy. They are among the most commonly used reversible methods of contraception.

Injectable (54%): Injectable contraceptives are hormonal shots administered at regular intervals (e.g., Depo-Provera) offering contraceptive protection for weeks or months.

Sterilizations (6%): Sterilization procedures, such as tubal ligation (for women) or vasectomy (for men), are permanent methods of contraception often chosen by individuals or couples who do not desire future pregnancies.

The choice of contraceptive method often depends on factors like effectiveness, convenience, personal beliefs, medical considerations, and partner involvement. Understanding these preferences and utilization patterns is crucial for healthcare providers and policymakers to tailor family planning programs, improve accessibility to various methods, offer comprehensive information, and address any barriers preventing individuals from utilizing appropriate contraceptive methods for their reproductive health needs.

5.8. Knowledge regarding Breast feeding

Opinion Regarding Duration of Exclusive Breastfeeding:

A significant majority (79%) understand and support the recommended duration of exclusive breastfeeding for the first six months of an infant's life, in line with global health recommendations by organizations like the WHO and UNICEF.

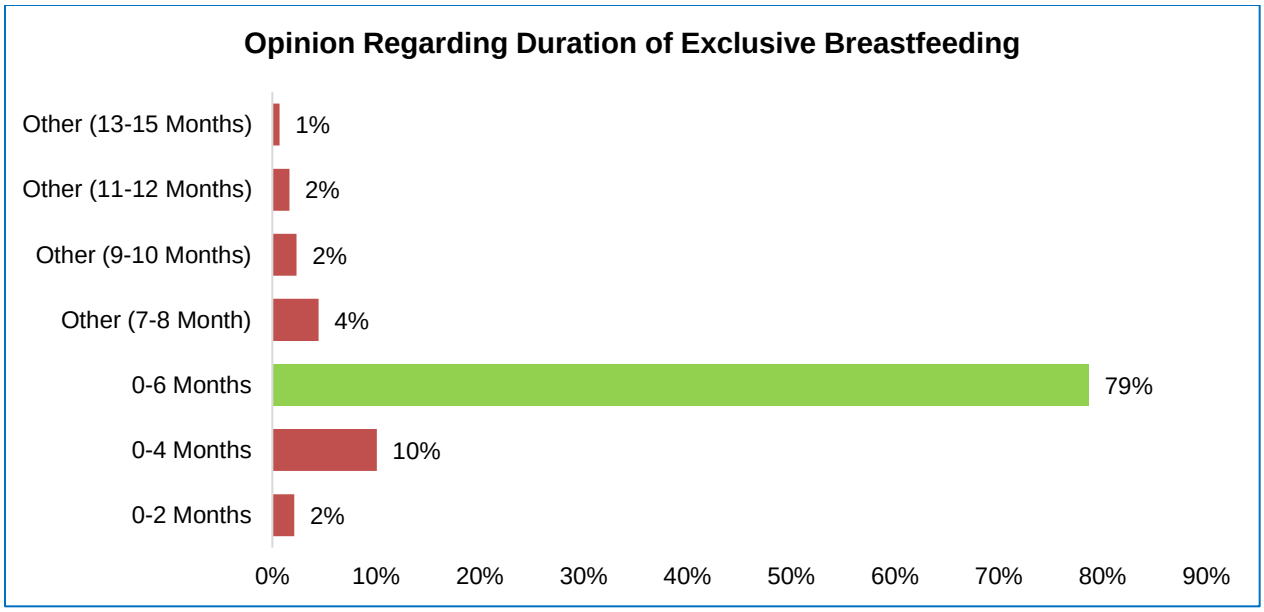

Figure 11. Opinion Regarding Duration of Exclusive Breastfeeding

Age to stop breastfeeding:

A significant majority of respondents (61.2%) endorse breastfeeding beyond 23 months, with support gradually decreasing for the 18-23 months and 16-18 months categories. This suggests a widespread recognition of the advantages of extended breastfeeding in promoting child health and development. However, a smaller proportion (less than 5%) considered 12 months for stopping breastfeeding (Please refer to figure below).

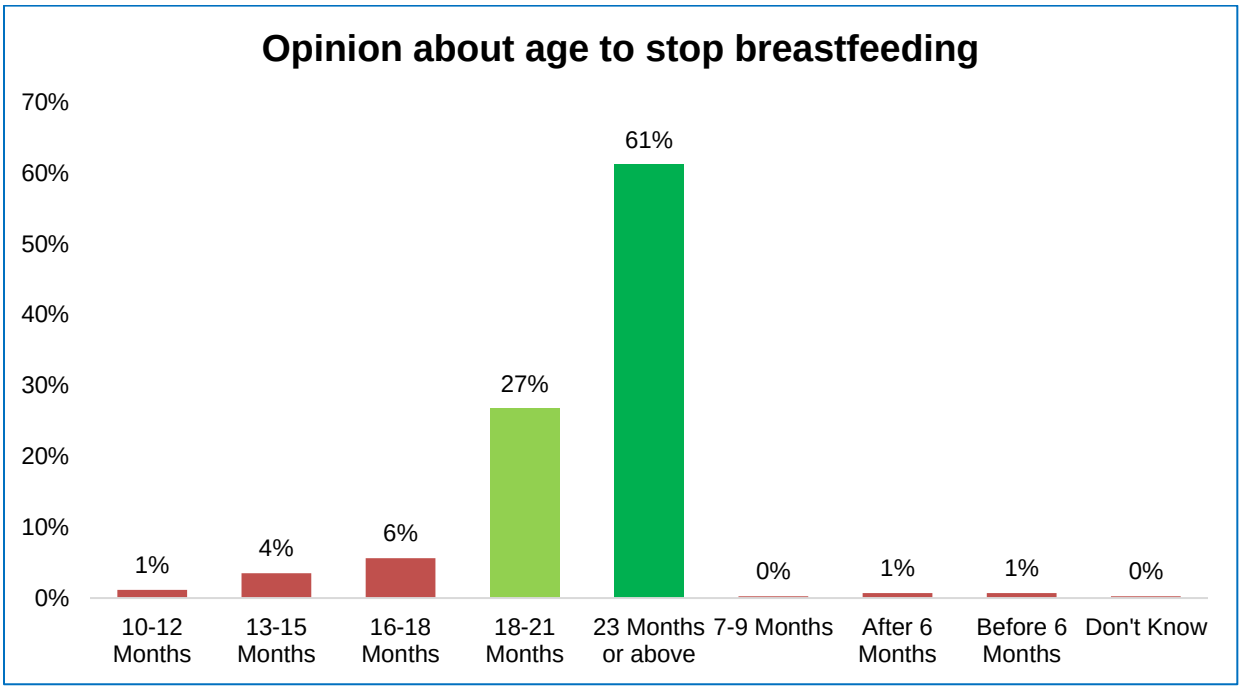

Figure 12. Opinion about age to stop breastfeeding.

Frequency of breastfeeding:

The recommended frequency of breastfeeding for infants is generally 8–12 times per day, ensuring that the baby receives sufficient nourishment and benefits from the protective factors in breast milk. The majority of the mother opinion about breast frequency ranging from 5-12 time in 24 hours.

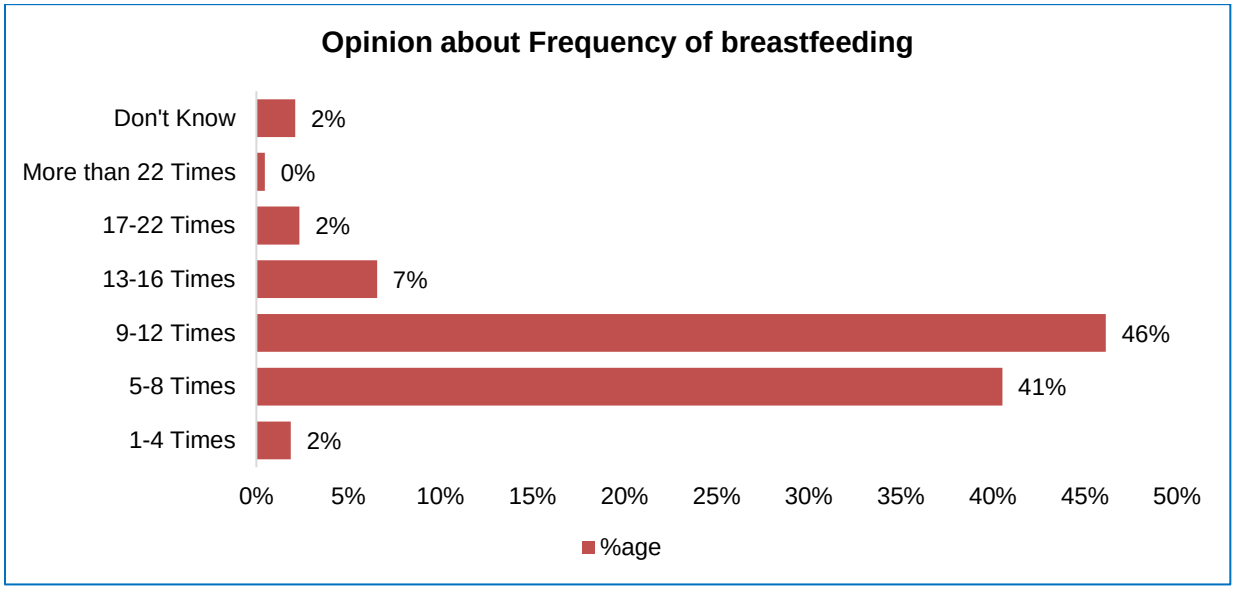

Figure 13. Opinion about Frequency of breastfeeding

The data suggests a positive understanding and adherence to recommended breastfeeding practices among the surveyed mothers, including awareness of the duration of exclusive breastfeeding for the first six months, support for extended breastfeeding beyond 23 months, and frequent breastfeeding sessions. These findings indicate a good level of knowledge and alignment with global recommendations regarding breastfeeding practices for optimal infant health and development.

5.9. Infant and Young Child Feeding-IYCF Key indicators

Inadequate feeding practices are often a critical driver of poor nutritional outcomes in children. WHO recommends exclusive breastfeeding up to six months of age, after which infants should start receiving complementary foods in addition to breastmilk. The transition from exclusive breastfeeding to complementary feeding is a very vulnerable period and is often the time that malnutrition starts in many infants. The MIYCF practices were calculated based on the WHO Guidelines[13] released in 2021.

Below table represents the MIYCF indicators for Dadu district.

[13] https://www.who.int/publications/i/item/9789240018389

Table 24. MIYCF Key Indicators

Section 1. Summary of IYCF Indicators					
Indicators	**N**	**n**	**%**	**CI 95%**	
Child Ever Been Breastfed-EvBF (0-23 months)	248	247	99.6%	0.98	1.00
Early Initiation of Breastfeeding-(EIBF) (0-23 months)	248	163	66%	0.60	0.72
Exclusively breastfed for the first two days after birth-(EBF2D) (0-23 mon)	248	174	70.2%	0.64	0.76
Squeeze Out & Throw Away 1st Milk (Colostrum)	248	30	12.1%	0.08	0.17
Exclusive breastfeeding under six months (EBF) (0-5)	62	34	54.8%	0.41	0.67
Continued breastfeeding 12–23 months (CBF)	121	86	71.1%	0.62	0.79
Bottle feeding 0–23 months (BoF)	248	122	53.2%	0.46	0.59
Mixed milk feeding under six months (MixMF)	62	25	40.3%	0.28	0.54
Introduction of solid, semisolid or soft foods 6–8 months (ISSSF)	20	8	40%	0.19	0.64
Minimum meal frequency 6–23 months (MMF)	186	68	36.6%	0.30	0.44
Minimum dietary diversity 6–23 months (MDD)	186	6	3.2%	0.01	0.07
Minimum milk feeding frequency for non-breastfed children 6–23 months (MMFF)	186	8	4.3%	0.02	0.08
Minimum acceptable diet 6–23 months (MAD)	186	4	2.2%	0.01	0.05
Egg and/or flesh food consumption 6–23 months (EFF)	186	11	5.9%	0.03	0.10
Sweet beverage consumption 6–23 months (SwB)	186	14	7.5%	0.04	0.12
Unhealthy food consumption 6–23 months (UFC)	186	1	0.5%	0.00	0.03

Ever breastfed (EvBF) (0-23 Months): 247 out of 248 children (99.6%) in the 0-23 months' age group have ever been breastfed. This high percentage indicates a prevalent practice of initiating breastfeeding among the surveyed children, showcasing widespread acceptance and adoption of breastfeeding.

Early initiation of breastfeeding (EIBF) (0-23 Months): 163 out of 248 children (66%) were breastfed within the first hour of birth. While over half the children were breastfed early after birth, the percentage suggests there might be room for improvement in promoting immediate breastfeeding initiation, as per global health recommendations.

Exclusively breastfed for the first two days after birth (EBF2D) (0-23 Months):

A total of 174 out of 248 children (70.2%) received exclusive breastfeeding during the first two days after birth where the neonate receives colostrum. This high percentage underscores that the majority of the surveyed children benefited from exclusive breastfeeding in the crucial early days post-birth, promoting early bonding and ensuring the provision of essential nutrients.

Exclusive breastfeeding under six months (EBF) (0-5 Months): 34 out of 62 children (54.8%) aged 0-5 months were exclusively breastfed. This high percentage suggests good adherence to the recommendation of exclusive breastfeeding for infants up to 6 months of age, ensuring optimal nutrition and health for the infants.

Continued breastfeeding (CBF) (12-23 Months): 86 out of 127 children (71.1%) aged 12-23 months were continuing to breastfeed. A significant proportion of children in the 12-23 months age range are

continuing to receive the benefits of breastfeeding, contributing to their nutritional intake and immune support.

Introduction of solid, semisolid, or soft foods (6–8 Months) (ISSSF): 08 out of 20 children (40.1%) aged 6-8 months were introduced to solid, semisolid, or soft foods. While a majority have started complementary feeding by the recommended age, there's potential for improvement in introducing these foods in a timely manner to ensure proper nutrition and development.

Minimum dietary diversity 6–23 months (MDD), Minimum meal frequency 6–23 months (MMF), Minimum acceptable diet 6–23 months (MAD), and Egg and/or flesh food consumption 6–23 months (EFF) These indicators represent aspects of a child's diet diversity, meal frequency, and quality.

These indicators show critically low percentages (ranging from 3.2% to 7.5%), suggesting a need for improvement in meeting dietary diversity and nutritional adequacy among children aged 6-23 months.

Bottle feeding 0–23 months (BoF): 122 out of 248 children (53.2%) were reported to have been bottle-fed. The prevalence of bottle feeding in nearly half the surveyed children might indicate a reliance on bottles for feeding, potentially impacting breastfeeding practices and nutritional intake.

The data reflects generally positive adherence to some key breastfeeding and complementary feeding practices. However, it also highlights areas where there's room for improvement, such as early initiation of breastfeeding, dietary diversity, and limiting bottle feeding to ensure optimal nutrition and healthy feeding practices for infants and young children.

Bottle feeding is prevalent in Dadu district. When mothers were questioned about the reasons for transitioning from breastfeeding to bottle feeding, it revealed critical aspects that need immediate attention.

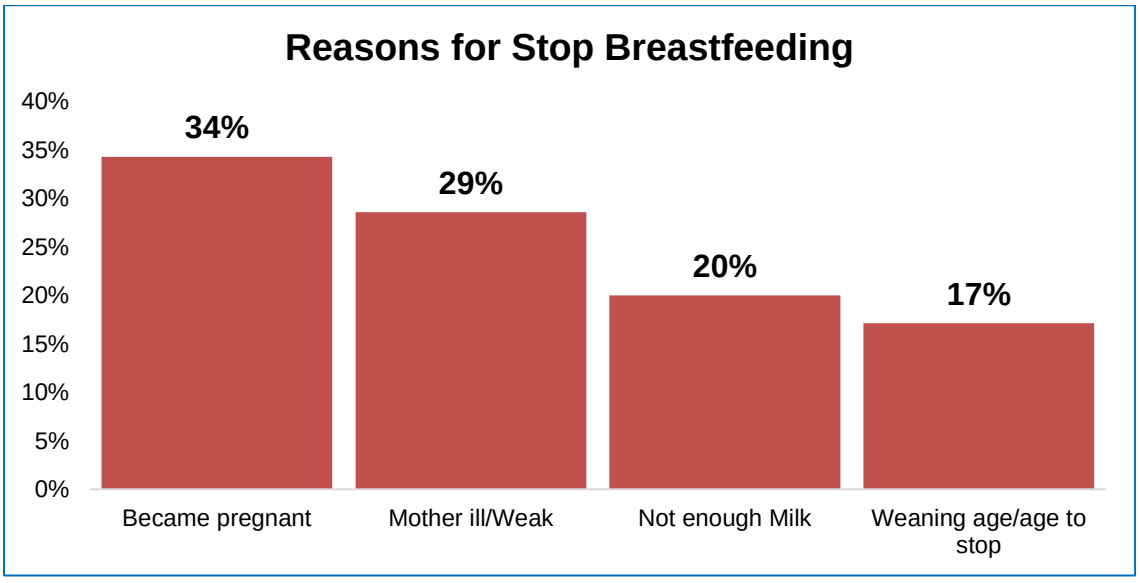

Figure 14. Reasons for Stop Breastfeeding

Became Pregnant: 34% stopped breastfeeding due to becoming pregnant again. This reason indicates that subsequent pregnancies might lead mothers to discontinue breastfeeding, possibly due to concerns about managing breastfeeding alongside a new pregnancy or misconceptions about breastfeeding during pregnancy.

Mother weakness: 29% stopped breastfeeding because the mother herself was ill or weak. Maternal health issues can significantly impact breastfeeding practices. Illness or weakness in the mother might affect her ability to breastfeed or her perception of the adequacy of her milk supply, leading to discontinuation.

Child ill or Weaning Age: 17% stopped breastfeeding due to reaching the intended weaning age. This reason implies a planned cessation of breastfeeding at a predetermined age, indicating a deliberate decision by the mother to wean the child at a specific time.

The above reasons for stopping breastfeeding encompass a spectrum of factors, spanning maternal health, child health, subsequent pregnancies, and child preferences or developmental stages. External factors, like becoming pregnant again or facing maternal health issues, can impact the continuous practice of breastfeeding. On the other hand, internal factors or personal choices, such as child illness or refusal to breastfeed and reaching the intended weaning age, contribute to the decision to cease breastfeeding.

This data highlighting the diverse array of influences leading to the discontinuation of breastfeeding, emphasizing the need to address both maternal and child health concerns. Providing mothers with comprehensive information and assistance becomes crucial in supporting breastfeeding continuity, considering its manifold benefits for both maternal and child health.

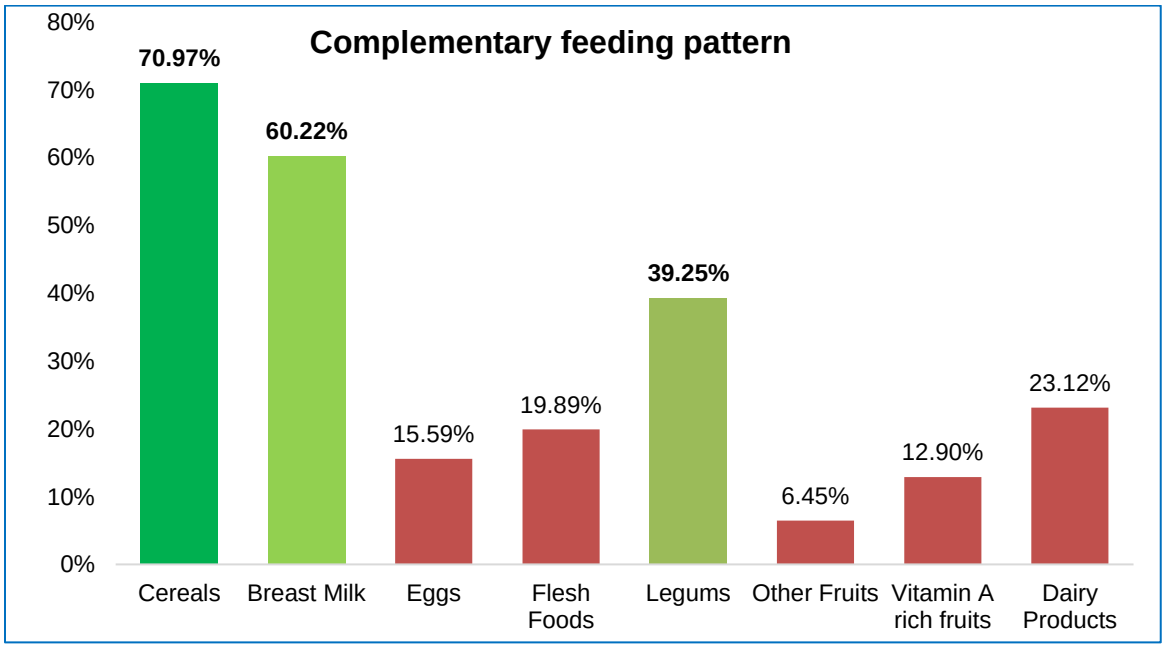

Figure 15. Complementary feeding pattern among children 6-23 months

Cereals (70.9%): Cereals are a significant part of the complementary diet for children, constituting 60% of the reported consumption. This includes grains like rice, wheat, maize, etc., which are commonly introduced as solid foods to infants.

Breast Milk (60.2%): Breast milk is reported to be part of the diet for 60.2% of children aged 6-23 months. This percentage indicates that breastfeeding is still a significant source of nutrition even as complementary foods are introduced, highlighting its continued importance for child nutrition and immunity.

Eggs (15.6%) and Flesh Foods (20%): Eggs and flesh foods, which include meats like poultry, fish, or red meat, constitute a lower percentage of the diet. Both sources of animal protein are essential for providing vital nutrients like iron, zinc, and protein to support growth and development.

Legumes (39.3%): Legumes, such as lentils, beans, or peas, are reported to be included in the diet for 39.3% of children. Legumes are excellent sources of protein, fiber, and various vitamins and minerals, contributing to a balanced diet.

Other Fruits (6.45%) and Vitamin A rich fruit (13%): Other fruits besides breast milk are consumed by 5.20% of children, whereas fruits rich in Vitamin A are consumed by 13% of them. Fruits provide essential vitamins, minerals, and antioxidants necessary for growth and immunity.

Dairy Products (23.1%): Dairy products, including milk, yogurt, or cheese, make up 23.1% of the diet. Dairy is a significant source of calcium and other nutrients vital for bone health and growth. The data indicates a varied but potentially limited dietary diversity among children aged 6-23 months in terms of complementary feeding.

While cereals, legumes, and breast milk are widely included, there's a relatively lower consumption of animal-source foods (eggs, flesh foods) and other fruits rich in Vitamin A. Encouraging a more diverse diet that includes a wider range of nutrient-rich foods, especially animal-source foods and fruits, could enhance the overall nutritional intake and support healthy growth and development among children in this age group. Improving dietary diversity through a balanced and varied diet is crucial during the complementary feeding phase to ensure children receive a wide array of essential nutrients for optimal growth, development, and health.

5.10. WASH

Half of all water, sanitation and hygiene facilities in some of the hardest hit flood areas of Pakistan have suffered major damage, leaving already vulnerable communities exposed to increased risk of disease. Especially women and girls are impacted. According to the UN humanitarian organization OCHA, up to 50% of water, sanitation and hygiene facilities in Sindh provinces have suffered major damage. The current survey will give a recent situation in the surveyed population.

5.10.1. Access to drinking Water

Hand pumps/borehole: (41.9%) access drinking water from hand pumps or boreholes. Hand pumps and boreholes are manually operated systems or drilled wells that provide access to groundwater. This percentage indicates a significant portion of the population relies on groundwater for their drinking water needs.

Public tap/standpipe: (43.1%) access drinking water from public taps or standpipes. Public taps or standpipes are communal water sources usually connected to a municipal supply. This high percentage suggests that a majority of the surveyed population relies on a shared or communal water source for drinking purposes. The results show a slight contradiction with the other provincial reports, where hand pumps are the major source, however, the recent floods caused severe damage to the hand pumps, and these households are now depended on the temporary public or non-governmental schemes.

Piped Connection to house: (6.1%) have a piped connection directly to their house for accessing drinking water. Having a piped connection to the house indicates a more convenient and direct water supply. However, the low percentage suggests that only a small fraction of the surveyed population has this level of direct access.

Water seller/kiosk: (4%) obtain drinking water from water sellers or kiosks. Water sellers or kiosks are small vendors selling water. This percentage indicates a portion of the population relies on purchased water from such vendors, potentially due to lack of access to other sources or for convenience.

The data shows a varied range of sources for obtaining drinking water, with public taps/standpipes being the most common source, followed by hand pumps/boreholes. A small fraction has direct piped connections to their houses, indicating the limited availability of such infrastructure in the surveyed area. There's also reliance on alternative sources like water vendors or tanker trucks from protected sources, suggesting that some individuals might face challenges in accessing safe and reliable drinking water. Improving access to safe and reliable drinking water sources, especially through piped connections or increasing access to protected sources, could contribute significantly to ensuring clean and accessible drinking water for the population.

Table 25. Sources of Drinking Water

Source	N	n	%	CI 95%	
Hand pumps /borehole	427	179	41.9%	0.37	0.47
Public tap/standpipe	427	184	43.1%	0.38	0.48
Piped connection (or neighbor's house)	427	26	6.1%	0.04	0.09
Water seller/kiosks	427	17	4.0%	0.02	0.06
Bottled water, water sachets	427	14	3.3%	0.02	0.05
Unprotected spring	427	3	0.7%	0.00	0.02
Surface water (lake, pond, dam, river	427	3	0.7%	0.00	0.02
Tanker truck from a protected source	427	1	0.2%	0.00	0.01

5.10.2. Water Treatment Methods used in Dadu District

The data suggests that a vast majority of respondents do not treat (95.1%) their water before consumption, indicating potential risks of consuming untreated water.

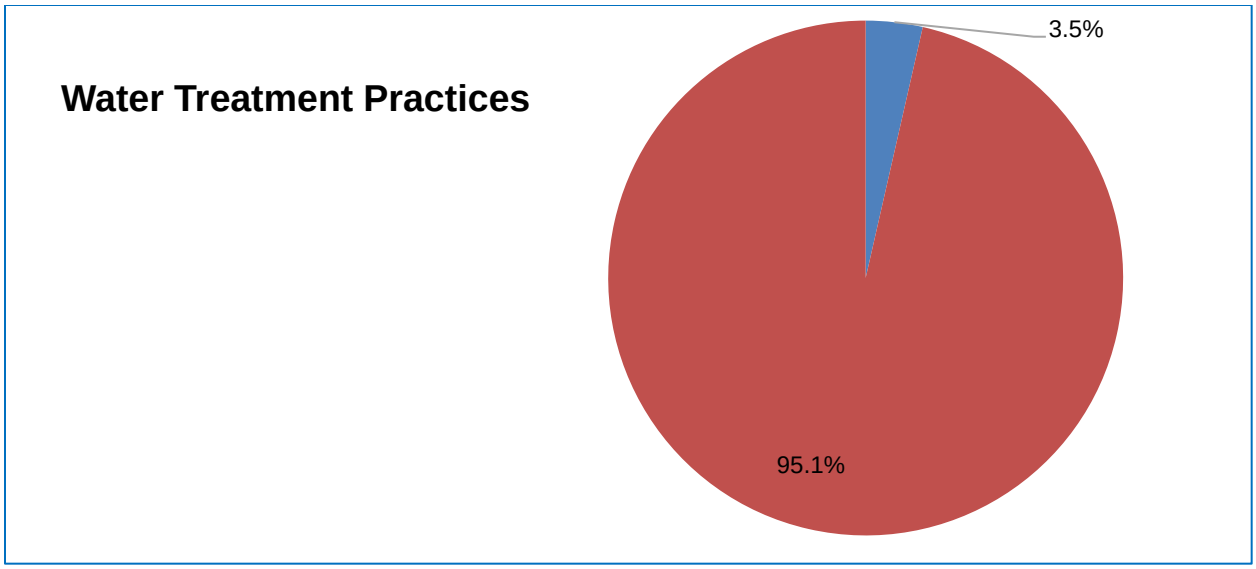

Figure 16. Water Treatment Practices

5.10.3. Water collection from water sources

Household Water Collection by Adult Females: (73.1%) reported that adult females are responsible for household water collection. This statistic shows a prevalent practice where adult females are primarily responsible for fetching water for households, indicating potential gender disparities in water-related chores. While only 23% reported adult males being responsible for household water collection. This suggests a proportion of households where adult males are involved in water collection, possibly in addition to or instead of females, indicating variations in gender roles concerning water-related tasks.

Gender disparities in water collection responsibilities are evident, with adult females largely responsible, but a portion of households also involving adult males. These findings highlight the need for interventions focused on water treatment, sanitation improvements, gender equality in household responsibilities, and addressing economic barriers to ensure better hygiene practices and public health outcomes within the surveyed population.

5.10.4. Hygiene

Availability of Soap: (68.2%) reported having soap available. 137 individuals (38.8%) reported not having soap available. While a majority have access to soap, a notable percentage lacks access, which could impact proper hygiene practices, especially hand washing.

Households Unable to Afford Soap: (52.1%) stated that households cannot afford soap. The high percentage reflects financial constraints preventing access to soap, indicating economic challenges affecting hygiene practices. The data reveals concerning trends such as the majority not treating water before consumption, significant open defecation practices, and challenges in soap availability due to affordability issues.

The other reasons for soap unavailability are stated in the figure below.

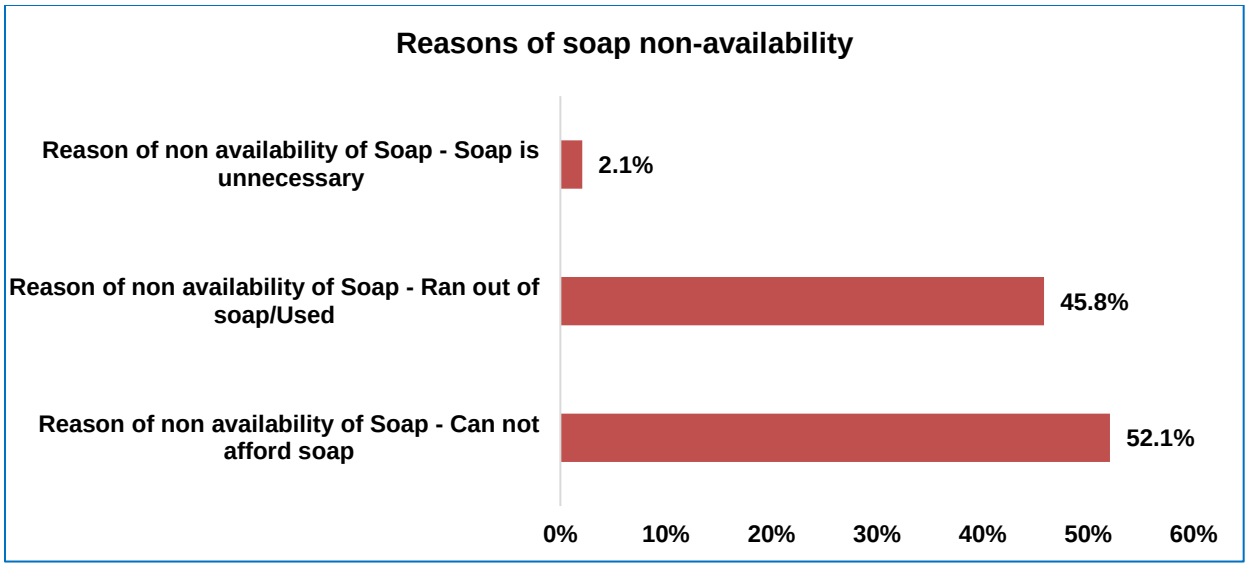

Figure 17. Reasons of soap non-availability

Hand Washing Timings

Handwashing at critical timings is vital for maintaining proper hygiene and preventing the spread of infections, despite the knowledge about the importance, the practices are not up to the mark and caused several public health challenges.

According to survey respondents, 53.4% indicated that they consider handwashing as important solely before eating, while 17% reported its significance only after defecation. A small proportion only indicates the hand washing importance after handling a child stool/Changing a nappy of child. These findings do indicate a need to incorporate hygiene promotion in public health programs as the critical times of handwashing are missed which contributes to orofecal transmission of disease vectors.

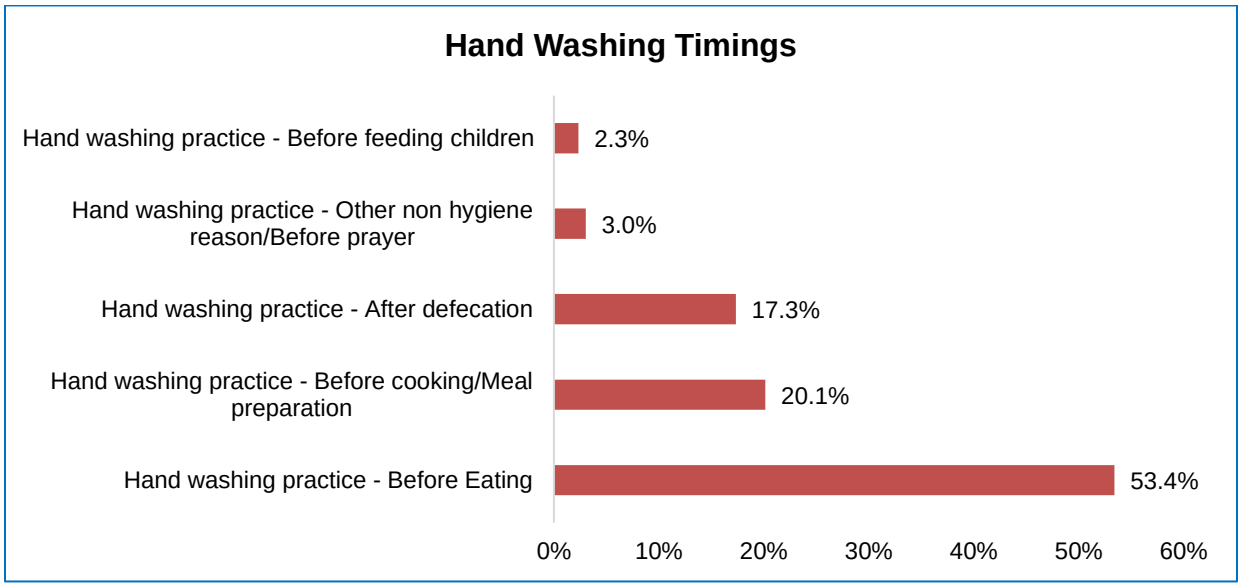

Figure 18. Hand Washing Timings

5.10.5. Latrine availability and open defecation Practices

Types of Latrine Facilities

Household Latrine (70.7%): This indicates that a majority of households surveyed have their own private latrine facilities, which are considered beneficial for maintaining privacy and hygiene within the household. Having a household latrine is an essential aspect of proper sanitation, however, the majority of the households reported that latrines are not enough to meet the needs of all household members.

Communal Latrine (7.3%) and Shared Latrines (6.1%): These figures represent households sharing or using communal latrines. Communal or shared latrines are facilities used by multiple households, which might lead to hygiene and privacy concerns due to shared usage.

Open Defecation (15.9%): Open defecation indicates a lack of access to adequate toilet facilities. It poses significant health risks, contributes to environmental pollution, and can lead to the spread of diseases. The data highlights that a substantial proportion of the surveyed population relies on personal or shared latrine facilities, but a considerable number still resort to open defecation, indicating inadequate access to proper sanitation infrastructure for a significant segment of the community. Among the household practicing open defecation 71% reported no latrine as main reason.

Reasons for Open Defecation: Latrine Too Far (4 individuals, 2.0%): This reason indicates that some individuals find latrines distant from their homes, possibly contributing to the challenge of accessing and using proper facilities due to distance.

No Latrine Available (71.1%): The majority cited the unavailability of latrines as the main reason for open defecation. This points to a critical shortage or absence of proper sanitation facilities in the community.

Adequate Privacy in Toilet Facilities: (74%) reported having adequate privacy in their toilet facilities. While a majority reported adequate privacy, a notable percentage might lack proper privacy in their toilet facilities, highlighting potential issues in sanitation and privacy standards.

Under 5 children's Faeces Disposal practice: The majority of the respondent stated that they collect the children’s faeces and trash it into the latrine or designated area. However, a significant proportion (10.8%) still practicing unhealthy practices.

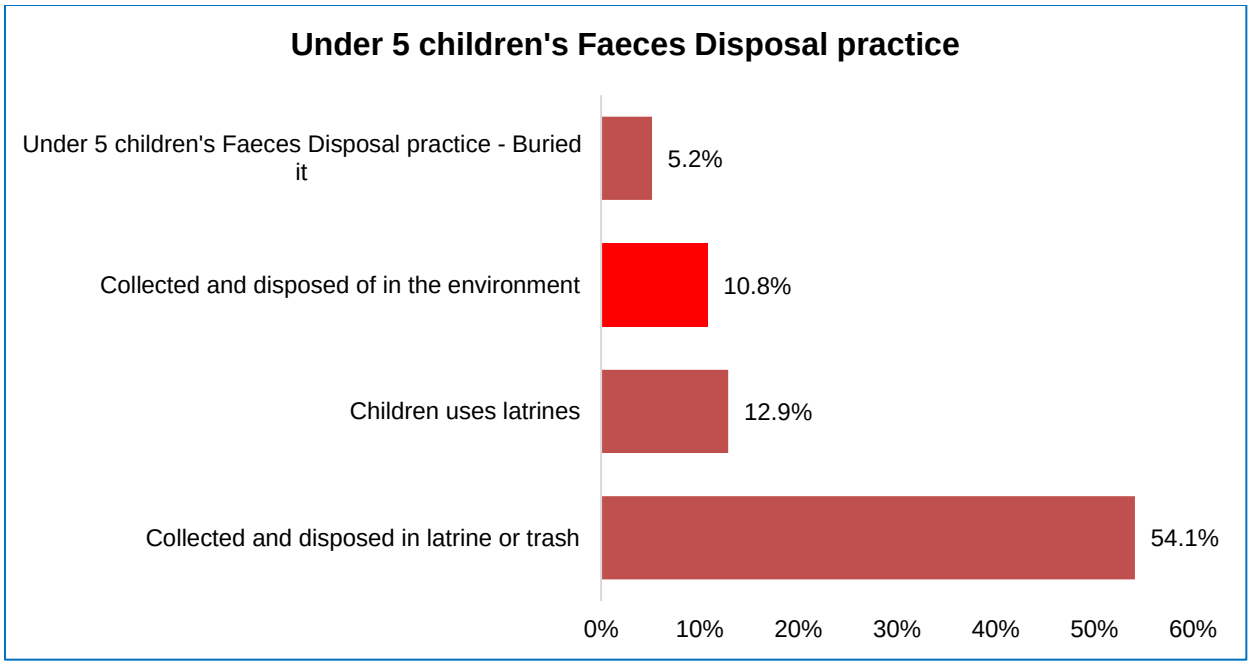

Figure 19. Under 5 children's Faeces Disposal practice

The data revealed a critical need for improved sanitation infrastructure, especially in terms of increasing access to latrine facilities. The majority of households having their own latrines is positive, but there's still a considerable portion relying on shared or communal facilities and open defecation. The primary reason cited for open defecation is the unavailability of latrines, signifying the urgent need for investment in sanitation infrastructure to ensure proper access to toilet facilities for all community members. Addressing these issues would significantly improve sanitation, hygiene, and overall public health within the surveyed population.

5.11. Food Security

5.11.1. Minimum Dietary Diversity -Women

High MDD-W: Only (20.2%) of women fall into the High Minimum Dietary Diversity category. Women categorized as having high MDD-W consume a wide variety of food groups from various sources. They likely incorporate diverse nutrients into their diet by including different types of fruits, vegetables, proteins, grains, and dairy products, contributing to a balanced and nutritionally rich dietary pattern.

Medium MDD-W: (23%) women are classified in the Medium Minimum Dietary Diversity category. Women in this group display a moderate level of dietary diversity. They might consume a

reasonable variety of food groups but might not have as wide a range as those in the High category. There is room for improvement to further diversify their diet for better nutrition.

Low MDD-W: The majority **(**56.9%) of surveyed women fall into the low group, indicating a lack of diversity in their diet. Women in this category likely consume a limited variety of food groups, potentially lacking essential nutrients from various sources, which could impact their overall nutrition and health.

The data indicates that a substantial number of surveyed women exhibit a restricted diversity in their food intake. The majority fall within the Low Minimum Dietary Diversity for Women (MDD-W) category, signaling the necessity for interventions aimed at enhancing dietary diversity among women. Promoting the consumption of a more varied range of food groups can elevate their nutritional intake, ensuring the acquisition of a comprehensive spectrum of essential nutrients crucial for overall health, particularly during pregnancy and lactation.

Community education on dietary diversity and information on locally available and affordable exchanges within the acceptable food groups needs to be imparted both through the health workers and the health care practitioners.

Strategies might include, nutritional counseling, improving access to diverse food options, and promoting culturally appropriate dietary practices to enhance dietary diversity among women. Enhancing dietary diversity among women is crucial for addressing potential nutritional deficiencies, supporting maternal and child health, and promoting overall well-being among communities.

Table 26. Minimum Dietary Diversity-Women (MDD-W)

Minimum Dietary Diversity-Women (MDD-W)	N	n	%	CI 95%	
High	496	100	20.2%	0.17	0.24
Medium	496	114	23.0%	0.19	0.27
Low	496	282	56.9%	0.52	0.61

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

5.11.2. 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: This category includes individuals who reported experiencing either no hunger or only mild hunger. In this dataset, 14.8% households fall into this category. These individuals face minimal challenges related to obtaining enough food or experiencing hunger.

Moderate Hunger: This category comprises households experiencing a moderate level of hunger. Among the surveyed population, 38.6% of households fall into this group. These individuals face a higher level of food insecurity, experiencing moderate challenges in accessing sufficient food.

Severe Hunger: The largest proportion, 46.6% of households fall into this category, indicating a significant prevalence of severe hunger among the surveyed individuals. These individuals face substantial challenges in obtaining enough food, indicating a critical level of food insecurity within this population.

Table 27. Food Insecurity Experience Scale (FIES)

Food Insecurity Experience Scale (FIES)[14]					
Category	**N**	**n**	**%**	**CI 95%**	
None/Light Hunger	427	199	46.6%	0.42	0.51
Moderate Hunger	427	165	38.6%	0.34	0.43
Severe Hunger	427	63	14.8%	0.12	0.18

The FIES results reveal a strikingly high prevalence of food insecurity, with a majority of individuals experiencing moderate to severe hunger. This highlights the significant challenges faced by the surveyed population in accessing adequate and nutritious food.

5.11.3. Reduced Coping Strategy Index (rCSI):

High Coping: This group represents individuals who reported employing effective coping strategies to deal with food insecurity. Among the surveyed population, 15.9% of households fall into this category. These individuals likely utilize various strategies to manage food shortages effectively.

Medium Coping: 31.6% fall into this group, suggesting moderate coping strategies in dealing with food insecurity. They might employ some coping mechanisms but might face challenges in effectively managing food shortages.

No or Low Coping: This category includes individuals who reported having inadequate or no strategies to cope with food insecurity. 52.5% households fall into this group, indicating a significant portion of the surveyed population have resilience to manage food shortages.

The rCSI results indicate that while a substantial portion of the surveyed population employs coping strategies, there's a considerable percentage facing challenges in coping effectively with food insecurity due to the lack of or limited coping mechanisms.

[14] 0-1 score: None or light hunger, 2-3 scores: Moderate hunger, 4-6 scores: Severe hunger

Table 28. Reduced Coping Strategy Index- rCSI

Reduced Coping Strategy Index (rCSI)[15]					
Category	**N**	**n**	**%**	**CI 95%**	
High Coping	427	68	15.9%	0.13	0.20
Medium	427	135	31.6%	0.27	0.36
No or Low Coping	427	224	52.5%	0.48	0.57

The data portrays a concerning scenario of food insecurity, with a majority experiencing moderate to severe hunger. While a portion of the population demonstrates coping strategies, a significant proportion struggles with inadequate coping mechanisms, suggesting the need for comprehensive interventions to address food insecurity effectively. Addressing these issues will require targeted interventions focusing on improving access to food resources, implementing supportive policies, enhancing coping strategies, and providing assistance to vulnerable populations to ensure better food security outcomes.

6. Discussion

These findings highlight the urgent need for interventions and policies to address malnutrition and improve the nutritional status of children in Dadu. The major factors contributing to acute malnutrition include inadequate quality and quantity of food, high food insecurity, hygiene practices and sanitation coverage. Also, high rates of diarrhea, maternal nutrition and poor health seeking behavior are high. The malnutrition trends in all forms have fluctuated from last 10 years, due to several past shocks like rain floods, inflation, and damage to agriculture land. Which reduced households' access to food and resilience to shocks. Additionally, mother education is still very low as compared to other districts and need immediate attention to improve mother education through integration with health and nutrition programs.

GAM Rate Trend:

The Global acute malnutrition rate in Dadu shows a consistent trend from 2012 to 2023, some improvements are observed in this period, which may be due to large scale integrated nutrition programs, however, the current GAM rate in 2023 remains still high and needs immediate attention and monitoring, many partners are currently working in the districts and covering community outreach and treatment.

[15] No or low coping (CSI= 0-3), medium (CSI = 4-9, high coping (CSI ≥10).

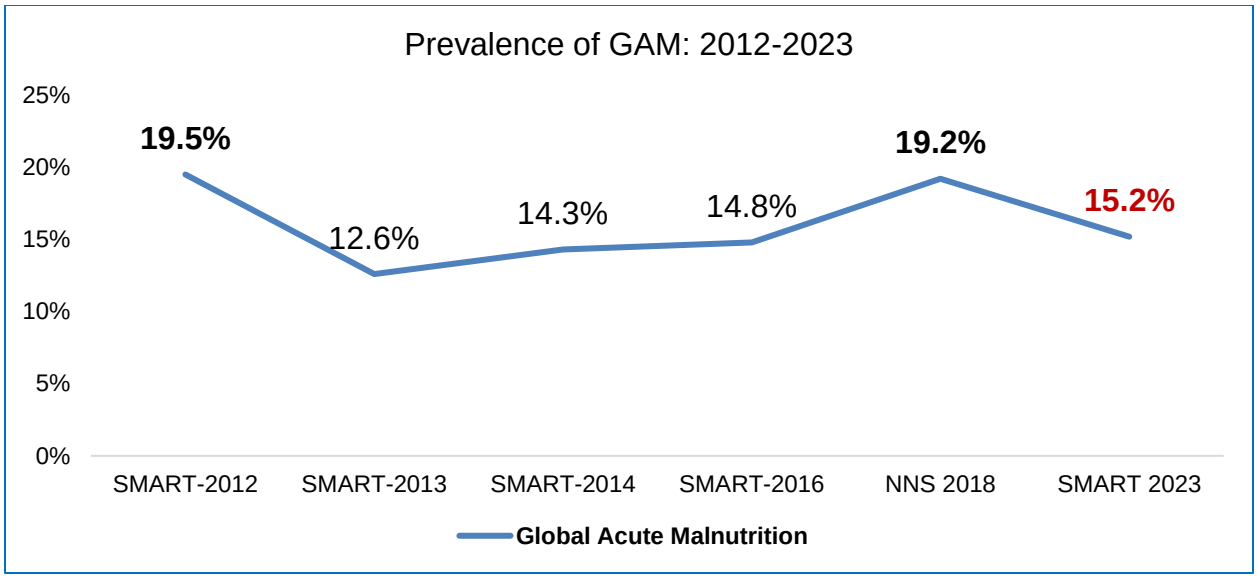

Figure 20. Prevalence of GAM - 2012-2023

Stunting:

The trends in stunting indicate positive progress over the past decade, reflecting the effectiveness of both current and previous nutrition programs. However, the present rate is nearly identical to the national average of 40% and falls below the overall stunting ratio for Sindh at 46%, as per the National Nutrition Survey 2018. Continuous monitoring is essential to sustain this progress, emphasizing the need for integrated nutrition-specific and sensitive programs to ensure ongoing improvement.

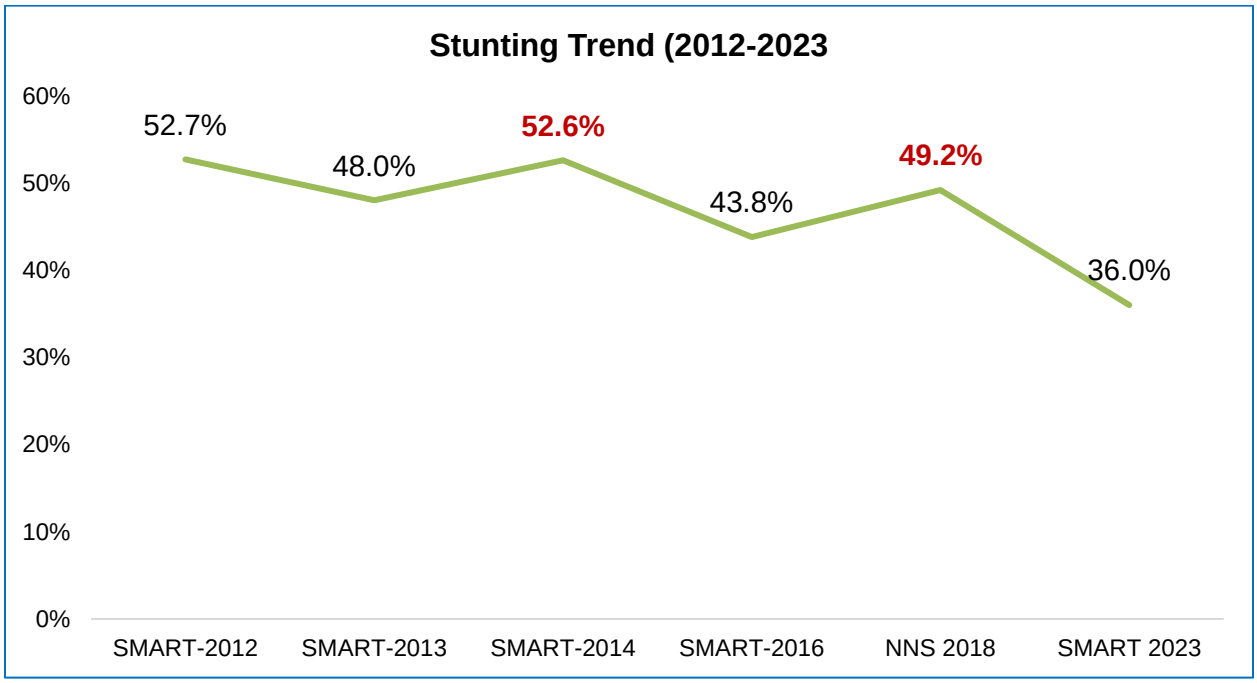

Figure 21. Stunting Trend (2012-2023)

Underweight:

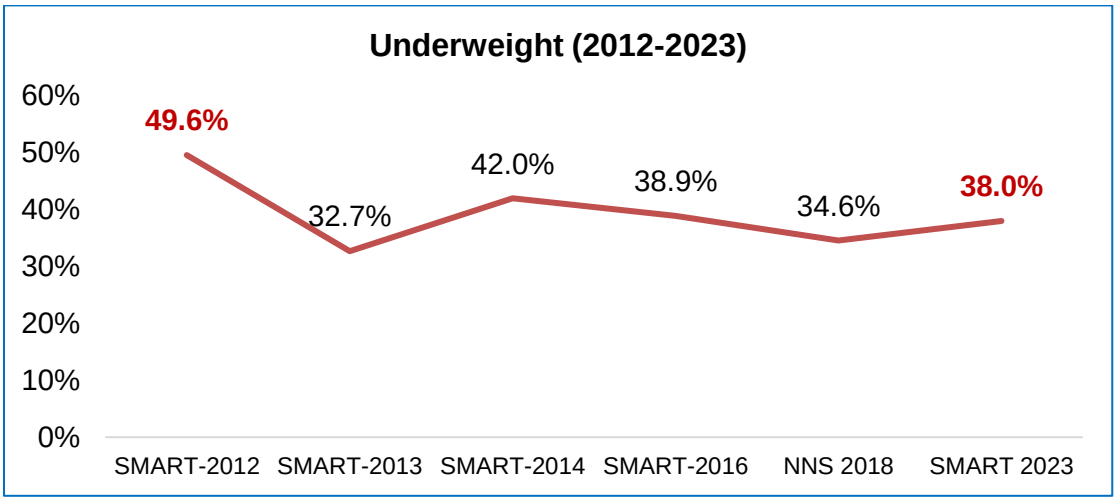

Figure 22. Underweight (2012-2023)

The data reflects generally positive adherence to some key breastfeeding and complementary feeding practices. However, it also highlights areas where there's room for improvement, such as early initiation of breastfeeding, dietary diversity, and limiting bottle feeding to ensure optimal nutrition and healthy feeding practices for infants and young children. However, high maternal nutrition and poor mother food diversity is the main causal factors, which prevent mothers to continue breast feeding, additionally, bottle feeding is prevalent in Dadu district. When mothers were questioned about the reasons for transitioning from breastfeeding to bottle feeding, it revealed critical aspects that need immediate attention.

The data revealed a critical need for improved sanitation infrastructure, especially in terms of increasing access to latrine facilities. The majority of households having their own latrines is positive, but there's still a considerable portion relying on shared or communal facilities and open defecation. The primary reason cited for open defecation is the unavailability of latrines, signifying the urgent need for investment in sanitation infrastructure to ensure proper access to toilet facilities for all community members. Addressing these issues would significantly improve sanitation, hygiene, and overall public health within the surveyed population.

The data portrays a concerning scenario of food insecurity, with a majority experiencing moderate to severe hunger. While a portion of the population demonstrates coping strategies, a significant proportion struggles with inadequate coping mechanisms, suggesting the need for comprehensive interventions to address food insecurity effectively. Furthermore, the coping strategies are common and almost half of the population experienced 1-2 coping strategies.

Gender imbalances in water collection responsibilities are apparent, predominantly with adult females bearing the burden, although a subset of households also includes adult males in this role. These observations underscore the necessity for targeted interventions. Prioritizing water treatment, enhancing sanitation infrastructure, promoting gender equality in domestic responsibilities, and tackling economic obstacles are crucial steps. These measures aim to ensure improved hygiene practices and enhanced public health outcomes among the surveyed population.

Main Contributing factors of high malnutrition and Food insecurity

The district of Dadu has faced a series of challenges over the past 10 years, encompassing elevated inflation linked to the nation's internal economic struggles, recurring droughts with insufficient rainfall and heat waves, heavy monsoon rains leading to flooding, and outbreaks of livestock diseases resulting in significant deaths. Consequently, the current period has witnessed adverse outcomes for food security in the region.

Looking ahead, the situation is anticipated to worsen further due to the devastating aftermath of one of the most severe monsoon floods in 2022. This calamity has inflicted extensive damage on agricultural infrastructure, resulted in substantial livestock losses, and had a detrimental impact on overall food production, as well as the availability of food and livelihood opportunities. Accessing food is poised to become increasingly challenging, given the persistent rise in food commodity prices. Moreover, the post-flooding scenario is expected to contribute to a reduction in livelihood opportunities, exacerbating food insecurity in the area.

7. Recommendations

Based on the findings of the SMART Nutrition Survey in Dadu, 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	Expansion of the Nutrition Programs	Expansion of the nutrition programs focusing on reducing wasting, stunting, and underweight among children aged 6-59 months. Integration of conditional food vouchers or direct support to families with malnourished children These programs should include strategies for improving dietary diversity, promoting breastfeeding practices, enhancing access to nutritious food Investment in IFA/Micronutrient supplementation and ensure compliance through family members/influencers
	Collaboration Mechanism	Devise a district-level nutrition strategy from the provincial nutrition strategies and develop a monitoring framework to monitor the situation Promote Family MUAC and collaboration with outreach team, community leaders, and NGOs is essential for effective implementation.
	Integrated Healthcare Services	Vaccination drive and mass campaign regularly to identify zero doses, mapping of uncovered areas through additional resources. Integration of vaccination coverage within the existing nutrition program
	Community Education and Outreach	Utilize Social media influencers from the local community to disseminate information effectively through various social media channels Ensure counseling at ANC visits about balanced diets, the importance of breastfeeding, proper infant and child feeding practices, and hygiene measures to prevent illnesses that contribute to malnutrition. Family planning integration in the IEC materials to promote and provide cost free services.
	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.

		Need investment in the family planning services is critical at all stages from ANC to PNC visits
	Improve Access to Healthcare Facilities	Post flood rehabilitation of the existing health facilities is essential to continue the service delivery Availability of the health service providers should be ensured by comprehensive mapping to cover the gap.
	Increase in IFA Tablet Consumption	Specialized IFA tablet packing is essential and should be designed to have key messages and importance in local or national language Engagement of the Schools/institutes (Adolescent Girls) can play a vital role to promote IFA tablets and compliance.
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.
	Diarrhea Management	The iCCM approach is needed to tackle the high rates of diarrhea training of community workers to more focus on increasing access to combined 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	Investment in income generation activities to support the livelihood of their households 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
		Expand social safety net programs such as food assistance programs, cash transfers, or food vouchers targeted at households facing severe food insecurity.

	Strengthen Safety Nets and Social Support	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	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. Nutrition Coverage Assessment to identify the barriers in the current programs and propose redesign.
Water, Sanitation, and Hygiene (WASH)	Enhancing Water Access and Infrastructure	Post flood rehabilitation of the water schemes at household's level and promote the use of water reservation techniques. Advocacy with district stakeholders to ensure safe/protected water sources through regular water checks.
	Improving Sanitation and Hygiene	Detailed WASH assessment is needed to trace the malnourished children and diarrhea cases to identify the problem and design context specific programs. Rehabilitation and construction of low-cost latrines to vulnerable households
	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, Schools, Teachers committee and NGOs to distribute soap and educate communities about its importance in maintaining hygiene and preventing illnesses.

8. Annexures

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

Annex II: Plausibility checks for: Final_Anthro & Mortality Dadu update until Oct 26, 2023 (3).as

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 **0** (0.8 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001
(Significant chi square)			0	2	4	10 **0** (p=0.516)
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=0.161)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20
			0	2	4	10 **0** (6)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20
			0	2	4	10 **4** (13)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20
			0	2	4	10 **2** (11)
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** (0.97)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6
			0	1	3	5 **1** (-0.23)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6
			0	1	3	5 **0** (0.10)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001
			0	1	3	5 **3** (p=0.002)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25 **10** %

The overall score of this survey is 10 %, that falls in good category.

Annex III Event Calendar

Month	EVENT CALENDAR 2018 TO 2023 (SINDH)											
	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		

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									
