FINAL REPORT

link nca

NUTRITION CAUSAL ANALYSIS

Settlements for Internally Displaced Persons, Dollow, Gedo
Region, Somalia
June 2021

ACTION AGAINST HUNGER

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FSNAU
Information for better livelihoods

ACKNOWLEGEMENTS

ABBREVIATIONS

AAH/ ACF	Action Against Hunger / Action Contre la Faim
AIMWG	Assessment Information Management Working Group
ANC	Antenatal Care
ARI	Acute Respiratory Infections
CEDA	Community Empowerment and Development Action
cGAM	Combined Global Acute Malnutrition
CI	Confidence Interval
CMAM	Community Management of Acute Malnutrition
CSB	Corn-Soya Blend
DGH	Dollow General Hospital
DHS	Demographic and Health Survey
EBF	Exclusive Breastfeeding
ENA	Emergency Nutrition Assessment
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
FEWSNET	Famine Early Warning System
FGD	Focus Group Discussion
FSL	Food Security and Livelihoods
FSNAU	Food Security Nutrition Analysis Unit
GAM	Global Acute Malnutrition
GBV	Gender-Based Violence
HAZ	Height for Age Z-Score
HDA	Human Development Action
HH	Household
HHS	Household Hunger Scale
HDDS	Household Dietary Diversity Score
IDP	Internally Displaced Persons
IOM	International Organisation for Migration
IPC	Integrated Phase Classification
IYCF	Infant and Young Child Feeding
IYCN	Infant and Young Child Nutrition
LZ	Livelihood Zone
MAHFP	Months of Adequate Household Food Provisioning
MAM	Moderate Acute Malnutrition
MCH	Maternal and Child Health
MUAC	Mid-Upper Arm Circumference
NCA	Nutrition Causal Analysis
NGO	Non-Governmental Organization
OTP	Outpatient Therapeutic Programme
PNC	Postnatal Care
PPS	Probability Proportionate to Size
rCSI	Reduced Coping Strategy Index
RFS	Risk Factor Survey
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring for Assessment in Relief & Transitions
SNS-NCA	Strengthening Nutrition Security –Nutrition Causal Analysis
TBA	Traditional Birth Attendant
TSFP	Targeted Supplementary Feeding Programme
UNICEF	United Nations' Children's Fund
USD	United States Dollar
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WAZ	Weight for Age Z-Score

| WHO | World Health Organization |
| WHZ | Weight for Height Z-Score |

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EXECUTIVE SUMMARY

Gedo region is in South Central Somalia, lying on the Ethiopian and Kenyan borders while sharing internal borders with four Somali Regions of Bay, Bakool, Middle Juba and Lower Juba. The economy of the region majorly depends on the livestock rearing and farming, but also has strong inter-regional and international cross-border trade with Kenya and Ethiopia. Gedo region has long been adversely affected by the cumulative effects of extended conflict and recurrent natural disasters, such as drought. These events have resulted in the disruption of livelihood systems and displacement of the population from within and around Gedo region. The internally displaced population has been settling in Dollow in two main informal settlements, Kabasa and Qansahley.

The level of Global Acute Malnutrition (GAM) across Dollow IDP settlements is consistently high, and often above emergency threshold. The most recent SMART survey, conducted by Trocaire in 2017 found GAM levels of 11.7% and stunting at 30.5%[1].

A current joint WFP/UNICEF supported resilience project was designed to address the main findings of the Nutrition Causal Analysis (NCA) conducted in 2015 by SNS[2] consortium. However, despite implementation of WASH, Health and Nutrition, Food Security and Livelihoods, and Education components, the GAM rates in Dollow remain high. As the project continues, a need to better understand the main causes of undernutrition retains its relevance in order to adapt the response programming more effectively.

This Link NCA study consisted of primary qualitative data collection and secondary quantitative data analyses using datasets provided by Food Security and Nutrition Analysis Unit (FSNAU) covering Gu and Deyr seasons[3] between 2014 and 2020.

Key findings

The analyses undertaken during this Link NCA study allowed to identify 17 risk factors, believed to have an impact on the incidence of undernutrition in the study zone. Following a triangulation of data from diverse sources, 4 risk factors were identified as having a major impact, 8 risk factors were classified as having an important impact and 5 risk factors were judged to have a minor impact on the incidence of undernutrition in the zone of study. Among the major risk factors, two were identified in the sector of mental health and care practices, namely non-optimal breastfeeding practices and non-optimal complementary feeding practices, while the other two major risk factors, low access to income sources and low coping capacities, were identified in the sector of food security and livelihoods.

Per community explanations, the dominant pathway to undernutrition likely takes its roots in a limited access to income sources, which triggers inadequate coping strategies with an effect on a dietary intake of the household, yet mostly affecting women of reproductive age and children under 5 years of age. Limited access to income sources coupled with low social support for women increases women's workload as women absorb income-generating responsibilities, which distance them from child care. Women's workload can be further exacerbated by repetitive pregnancies with consequences on their nutritional status, which lowers their capacity and/or perception of that capacity to breastfeed. Inadequate child care practices then translate into a child's higher vulnerability to diseases and inadequate nutritional intake, and consequently undernutrition. This pathway resembles the pathway designed for

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[1] WFP, 2018 (accessed at: https://insight.wfp.org/breaking-down-the-complex-web-of-malnutrition-in-somalia-af0d70e8ef10).
[2] Strengthening Nutrition Security in South Central Somalia:
https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/nov_2015_sns_nca_report.pdf.
[3] Rainy seasons; Deyr (Oct-Dec) season rainfall is usually of shorter duration and less amount and intensity compared to Gu (Mar-May) season rainfall but both are beneficial in supporting seasonal agricultural activities and replenishing water and pasture resources.

SO-19 livelihood zone covering IDP settlements in Kahda district during a Link NCA study in 2019[4].

Based on available data provided by FSNAU, the calculation of statistical associations between individual risk factors and nutritional status of children in surveyed households allowed to differentiate between causal mechanisms of wasting, stunting and underweight. Considering the priority focus of the FSNAU datasets on food security and nutrition, the supporting evidence for gender and water, sanitation and hygiene sectors was scarcer.

Common risk factors for *wasting* on the basis of at least one index (weight for height z-score (WHZ) or MUAC or WHZ and/or MUAC), *stunting* and *underweight* include a male child, the occurrence of morbidities, including diarrhoea and pneumonia, and the household's dependence on gifts/*zakaat*[5] as their primary source of income. On the other hand, children were less likely to be *wasted*, *stunted* or *underweight* if they received Vitamin A supplementation, consumed cereals or any meat, their household owned land or declared petty trade as their primary source of income.

Common risk factors for *wasting* on the basis of at least one index (WHZ or MUAC or WHZ and/or MUAC) and *stunting* include child's age, meaning children younger than 24 months had higher odds of being *wasted* or *stunted*. Children were also more likely to be *wasted* or *stunted* if they lived in households displaced by drought or households, which consumed flesh meat. On the other hand, the consumption of Vitamin A vegetables came out as a protective factor against wasting and stunting.

Common risk factors for *wasting* on the basis of at least one index (WHZ or MUAC or WHZ and/or MUAC) and *underweight* include child's age, the occurrence of fever or measles, mother's education, reduction of meal portions and consumption of organ meat.

Wasting (WHZ, MUAC or MUAC and/or WHZ)

Risk factors: Male children were more likely to be *wasted* on the basis of weight for height z-score and on the basis of MUAC and/or weight for height z-score but less likely to be wasted on the basis of MUAC only. The vulnerability of male children towards wasting was most pronounced during Deyr season of 2014 and 2016.

Children under 24 months were more likely to be wasted on the basis of MUAC or on the basis of MUAC and/or weight for height z-score while their likelihood being wasted was equally observed in both Gu and Deyr seasons from 2015 to 2020. Linear regression demonstrated age as a risk factor for wasting on the basis of weight for height z-score.

Children who had diarrhoea in the past two weeks prior to data collection were more likely to be *wasted* on the basis of MUAC during Deyr season but on the basis of weight for height z-score during Gu season. An increasing number of days of diarrhoea was associated with a decrease in child's weight for height z-score and MUAC.

Children who had pneumonia, fever or measles in the past two weeks prior to data collection were more likely to be *wasted*, notably in Deyr season.

Children from above average-sized households (≥6 members) were more likely to be *wasted*. The weaning age of a child, i.e. the age, at which a child stopped breastfeeding, was associated with a decrease in child's MUAC in Gu seasons of 2015 and 2016. Mother's education was associated with a decreased likelihood of having a *wasted* child on the basis of weight for height z-score but an increased likelihood of wasting by MUAC.

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[4] Conducted by Action Against Hunger Somalia for BRCIS consortium in SO-19 livelihood zone of Kahda district in 2019 (https://linknca.org/etude/baidoa_beletweyne_goldogob_and_kahda_districts.htm).
[5] Cash, food-in-kind, animals, etc.

Children from households that consumed eggs were more likely to be *wasted*. An increase in days consuming flesh meat was associated with a slight decrease in MUAC in Deyr seasons of 2014 and 2017, as was the consumption of oils and fats in a combined dataset (2014-2020). A decrease in MUAC was also associated with an increase in household consumption of Vitamin A rich vegetables in Deyr seasons of 2016 and 2019. However, data from Gu seasons of 2015 and 2016 shows Vitamin A rich vegetables as a protective factor for wasting on the basis of weight for height z-score.

Children from households that received income from casual labour, sales of camel and cattle and gifts/*zakaat*[5] were more likely to be *wasted*. Households that had been displaced by drought were more likely to have a *wasted* child on the basis of MUAC in Gu seasons of 2017 and 2018 but less likely to have a *wasted* child on the basis of weight for height z-score and MUAC and/or weight for height z-score in Gu seasons of 2015 and 2016. Households that had been displaced by insecurity were more likely to have a *wasted* child in Gu seasons of 2015 and 2016 while children from households that had been displaced for other reasons were more likely to be *wasted* in Deyr seasons of 2014 and 2016.

Households that shifted to eating less preferred foods or were begging for food were more likely to have a *wasted* child, especially during Deyr seasons of 2014 to 2016 for the latter. An increase in days limiting meal portions or quantity consumed in a meal, and an increase in days taking fewer meals in a day were associated with a slight decrease in MUAC.

Households where all members used the same toilet were more likely to have a *wasted* child

Protective factors: Children aged 36 months and under were less likely to be *wasted* on the basis of weight for height z-score and MUAC and/or weight for height z-score. Children that received Vitamin A supplementation or a polio vaccination were also less likely to be *wasted*. An increase in mother's age was associated with a slight increase in child's MUAC while mother's MUAC was associated with an increase in child's MUAC in Deyr and Gu seasons of 2015.

Children from households that consumed cereals were less likely to be *wasted* on the basis of MUAC. An increase in household consumption of organ meat had a positive influence on child's wasting in Gu seasons of 2015 and 2016. A significant influence of household consumption of any meat was observed in Deyr season of 2016. Increasing household consumption of Vitamin A rich fruits was associated with an increase in child's weight for height z-score and MUAC in Deyr season of 2014 and Gu seasons of 2015 and 2016 as well as child's MUAC in the latter two. An increase in household consumption of vegetables was identified as a protective factor for wasting in Gu seasons of 2017 and 2019.

Children from households that had a primary income from petty trade or self-employment were less likely to be *wasted* as well as children from households with land.

Stunting (HAZ)

Risk factors: Male children were more likely to be *stunted*, notably during Gu seasons of 2015, 2016 and 2020 and Deyr seasons of 2015, 2016, 2018 and 2020. Children under 24 months were more likely to be *stunted* while the likelihood of being stunted was not preferably linked to a particular season. Children under 36 months were more likely to be stunted in Deyr seasons from 2015, 2016 and 2019 and Gu seasons of 2014 to 2016. Increasing age was associated with an increase in child's height for age z-score, suggesting that younger children are at the highest risk of growth faltering.

Children who had diarrhoea in the past two weeks prior to data collection were more likely to be *stunted*, notably in Gu season, while an increasing number of days of diarrhoea was associated with a decrease in child's height for age z-score. Children who had pneumonia in the past two weeks prior to data collection were more likely to be *stunted*, notably in Deyr

season. In comparison to acute malnutrition, no associations were observed between stunting and fever or measles.

An increase in days consuming flesh meat was associated with a decrease in child's height for age z-score in Gu seasons of 2014, 2015 and 2019 as was the consumption of organ meat in Deyr season of 2019.

Children living in households who depended on gifts/*zakaat*[5] as their primary income were more likely to be *stunted*. Children from households that had been displaced by drought were more likely to be stunted in Gu seasons of 2018 and 2019. Households that had been displaced by flood or fire were more likely to have a *stunted* child in Deyr seasons of 2016 and 2018.

Protective factors: Children who received Vitamin A supplementation were less likely to be *stunted* only during Gu season of 2019. Households that consumed cereals and fruit in the last seven days prior to data collection were less likely to have a *stunted* child. An increase in the consumption of any meat was associated with an increase in child's height for age z-score in Gu season of 2018, with a stronger association in 2019. An increase in household's consumption of milk and milk products was associated with an increase in child's height for age z-score in Deyr seasons from 2014 to 2016. An increase in the consumption of Vitamin A rich vegetables was associated with an increase in child's height for age z-score in Deyr and Gu seasons of 2016 and 2019. The consumption of oils and fats came out as a protective factor against stunting in Deyr seasons of 2014 and 2015. Households that spent over 80% of earnings on food were less likely to have a *stunted* child.

Purchasing food on credit or borrowing food was associated with a decreased likelihood of children being *stunted* in Gu seasons of 2018 and 2019, as was relying on food donations from relatives in Deyr seasons of 2014 and 2016. Households that limited their meal portions in the last seven days prior to data collection were less likely to have a *stunted* child.

Children from households that had a primary income from petty trade as well as children living in households who owned land were less likely to be *stunted*. Households that had been displaced by insecurity were slightly less likely to have a *stunted* child in Deyr seasons of 2017 and 2019.

Children living in households with a woman decision-maker were less likely to be *stunted* however mother's education increased the likelihood of a child being *stunted*. Unlike in case of acute malnutrition, no associations with Mother's MUAC, size of the household or weaning age were observed.

Underweight (WAZ)

Risk factors: Male children and children under 36 months were more likely to be *underweight*. Children who had diarrhoea, pneumonia, fever or measles in the past two weeks prior to data collection were also more likely to be *underweight* while the likelihood was higher in Deyr season. An increasing number of days of diarrhoea was associated with a decrease in child's weight for age z-score. Households that reduced meal portions or consumed spoiled or leftover food were more likely to have an *underweight* child.

Children from households that depended on gifts/*zakaat*[5] as their primary source of income were more likely to be *underweight*. Households that had been displaced by eviction were more likely to have an *underweight* child while households that had been displaced by flood or fire were more likely to have an *underweight* child in Deyr seasons of 2016 and 2018. Mother's education increased the likelihood of a child being *underweight*.

Protective factors: Children that received Vitamin A supplementation in the last 6 months prior to data collection had a slightly lesser chance of being *underweight*. Children of mothers in optimal nutritional health were slightly less likely to be *underweight* in Gu seasons of 2015 and 2016.

Households that borrowed food were less likely to have an *underweight* child. An increase in household consumption of cereals and organ meat decreased child's odds of being *underweight*. The consumption of milk and milk products as well as any meat had a significant positive influence on child's weight for age z-score in Deyr seasons of 2014 and 2016.

Children from households that relied on petty trade or other sources as their primary income were less likely to be *underweight*. Having land as an asset decreased likelihood of children being *underweight*, particularly in Gu seasons of 2019 and 2020.

Summary of ongoing interventions

Per community feedback, most interventions in IDP settlements in Dollow pertain to the health and nutrition and water, sanitation and hygiene sectors. They are primarily provided by UN agencies directly or via their local partners. While certain operational partners have been supporting the displaced population via food security and livelihoods projects, their scope is limited yet widely desired. Mother-to-mother support groups or village savings and loans associations (VSLA) are appreciated but their coverage and support mechanisms need to be strengthened to be able to deliver a desired effect. The population expressed a clear interest in more development-type programming, which would enhance in a sustainable manner their capacity to provide for their households instead of depending on emergency humanitarian assistance. In addition, they requested projects targeting underlying social issues, which, for example, prevent the appropriation of health messaging at community, household and individual level. A particular attention should be based to gender-sensitive programming, considering the practical implications of women-centred targeting on their workload and consequent capacity to follow recommendations on optimal child care practices.

Recommendations

Based on these findings, the following key activities are thus recommended to be considered for an incorporation into current/future interventions:

- Support ongoing awareness raising interventions at community level with household and individual level coaching initiatives aiming to support targeted vulnerable households/persons to adopt and maintain optimal child care behaviours. This can be done through existing networks of community health workers, mother-to-mother support groups or other community-accepted mechanisms, while ensuring that these actors can provide personalised mentoring adapted to concerned individuals' needs. These activities should primarily target women and children within 1000 days' window, notably male children, children from above-average sized households and children at heightened risk of common child morbidities, while ensuring that community-level awareness raising interventions address key identified barriers to behaviour change, including their gatekeepers;
- Provide personalised support to targeted vulnerable households/persons to build up and maintain their capacity to provide optimal care to children under 5 years of age, including the support to access income, cope in times of increased economic stress and other shocks experienced by the household. These activities should target households with unstable access to income, such as households depending on gifts, donations and begging as their primary source of income;
- Support community exchanges on social issues, such as the use of modern contraceptives, gender equality and gender-based violence, allowing community members to discuss in-depth and design intra-community solutions to these issues, without the pressure to accept "western" models of behaviour, which are incompatible with their value systems;
- Support women to access to safe sources of income, e.g. petty trade or self-employment, in the proximity of their homes in order to create an enabling environment for optimal child care practices in the form of a sustainable access to quality diet and quality mother-child interactions;

- Support the consumption of diversified diet, promoting sustainable, local food sources, including plant-based proteins.

Other recommendations include:

- Address long-term food insecurity of households in IDP settlements by facilitating access to land and a variety of income sources, including business and entrepreneurship training followed by business grants;
- Improve the quality of provided health services by strengthening skills and competencies of frontline workers and ensuring a continuous supply of medical materials and medicine. This should also include the provision of mental health care services;
- Strengthen investments in preventive measures against undernutrition, including antenatal consultations, vaccination, deworming and Vitamin A supplementation, among women and children at greater risk of undernutrition by encouraging community level screening and referral;
- Improve the access to water by increasing a number of water kiosks within the IDP settlements;
- Encourage community-led total sanitation initiatives, including community-led construction of latrines and desludging for filled latrines, to improve the environmental hygiene.

I.   INTRODUCTION

Gedo region is in South Central Somalia, lying on the Ethiopian and Kenyan borders while sharing internal borders with four Somali Region of Bay, Bakool, Middle Juba and Lower Juba. The region is the second largest in Somalia in terms of land mass and has an estimated population of 508,405 people, with 35.0% of the population living in rural areas, 21.5% living in the urban areas, 15.1% living in settlements for internally displaced persons while the remaining 28.5% are nomadic. There are six administrative districts in Gedo region: Garbaharey, Bardhere (the capital) and Elwak in the South, and Belet Hawa, Dollow and Luuq in the North. The economy of the region majorly depends on the livestock rearing and farming, but also has strong inter-regional and international cross-border trade with Kenya and Ethiopia, to some extent.

Gedo region has long been adversely affected by the cumulative effects of extended conflict and recurrent natural disasters, such as drought. These events have resulted in the disruption of livelihood systems and displacement of the population from within and around Gedo region. The internally displaced population has been settling in Dollow in two main informal settlements, Kabasa and Qansahley. Although Dollow's population is approximately 70,000, close to 70 percent are internally displaced persons (IDP). They are food insecure, relying on casual labour to earn money, as other livelihoods options are scarce. They live in poor conditions and rely on market purchase for their food provisioning. With a low asset base, IDPs are thus vulnerable to changes in labour availability, daily wage rates, food prices and availability[2].

Undernutrition landscape

Malnutrition in Somalia is complex and challenging, where cultural norms, lack of education and sheer poverty mean that its root causes are more than just a result of poor food and lack of micronutrients intake. Since 2011, malnutrition rates in many parts of Gedo have hovered above emergency threshold levels[6].

The level of Global Acute Malnutrition (GAM) across Dollow IDPs is consistently high, and often at emergency threshold. The most recent SMART survey, conducted by Trocaire in 2017 found GAM levels of 11.7% and stunting at 30.5%[1].

FSNAU	Gu 2018	Deyr 2017/2018	Gu 2017	Deyr 2016/2017	Gu 2016	Deyr 2015/2016	Gu 2015	Deyr 2014/2015	GAM Average
Dollow IDPs sites	18.3%	13.9%	17.6%	14.9%	21.8%	25.0%	26.4%	21.6%	19.9%

Hypothesised drivers of undernutrition in the area include gaps in infant and young child feeding practices (IYCF), such as late initiation of breastfeeding and a lack of adherence to exclusive breastfeeding up to the age of six months, potentially adversely affected by heavy women's workload and the absence of fathers. Introduction of other foods and drinks often happens before children are six months old while the complementary foods show a lack of diversity, with many children not achieving adequate dietary diversity[7]. In addition, low vaccination coverage shows inadequacies in access to health care[7], with assessments citing cost, transport issues and a lack of drugs and staff at facilities as barriers[8]. Socio-cultural beliefs and practices, such as early marriage and pregnancy and repeated child bearing coupled with inadequate birth-spacing are also deemed to have a major impact on the nutritional status of children and their mothers.

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[6] >15%, https://www.who.int/nutrition/team/prevalence-thresholds-wasting-overweight-stunting-children-paper.pdf?ua=1.
[7] Somali Infant and Young Child Nutrition Assessment, 2016.
[8] Trocaire, Gender Analysis Report (2019).

Justification of the study

A current joint WFP/UNICEF supported resilience project was designed to address the main findings of the SNS Nutrition Causal Analysis conducted in 2015. Despite the implementation of WASH, Health and Nutrition, Food Security and Livelihoods, and Education components, the GAM rates in Dollow remain critically high. However, as the project continues, a need to better understand the main causes of undernutrition retains its relevance in order to adapt the response programming more effectively.

II. STUDY OBJECTIVES

Global objective

The main objective of this Link NCA is to identify the drivers of persistently high levels of acute malnutrition (wasting) in the study area. The findings from this Link NCA will be used to develop the recommendations aiming to strengthen the holistic approach to address the burden of acute malnutrition in Dollow Settlements for Internally Displaced People (IDPs) while aiming to strengthen the impact of nutrition programming.

Specific objectives

The study will aim to answer to the following specific objectives:

1. To identify and categorize risk factors responsible for acute malnutrition among the population in the target area and to estimate the prevalence of these risk factors, including seasonal and historical trends;
2. To understand how risk factors responsible for the undernutrition among the population in the target area interact with each other in order to determine which causal pathways to undernutrition are likely to explain most undernutrition cases in the target area;
    - Among others, the study will aim to establish linkages between acute malnutrition and various multi-sectoral risk factors. Whenever necessary, a thorough barrier analysis[7] will be considered in order to map out blockages for multisectoral prevention activities;
3. To understand how risk factors responsible for the undernutrition among the population in the target area have evolved over time and/or evolve in different seasons;
4. To identify vulnerable groups for each major risk factor of undernutrition among the population;
    - The study will also aim to establish whether the risk factors are influenced by any relevant geographic or socio-demographic variables, e.g. female and child headed households, households with disabled members, etc;
5. To identify and map the interventions of operational actors in the target area and analyse the perception and degree of adequacy and appropriation by communities of the current humanitarian operational response in relation to causes of undernutrition;
6. To identify the needs and capacities of communities to respond to the identified underlying mechanisms;
    - The study will also assess the coping capacities of IDPs vis-à-vis their vulnerabilities;
7. To identify with the communities, the levers and barriers likely to influence the main causal mechanisms of undernutrition;
8. To develop recommendations to improve nutrition security programs in the target area and to support the development of a comprehensive, multi-sectoral strategy.

III. METHODOLOGY

Type of methodology

A Link NCA Nutrition Causal Analysis is a method for analysing the multi-causality of undernutrition, as a starting point for improving the relevance and effectiveness of multi-sectoral nutrition security programming in a given context. It is a structured, participatory and holistic study that builds on UNICEF's conceptual framework of child undernutrition with an

objective to build an evidence-based consensus on plausible causes of undernutrition in a local context[9].

Key stages

A. Preparatory phase & Identification of hypothesised risk factors and causal pathways (February – December 2020)

The main objective of a preparatory phase was to define key parameters of the study, including its objectives, geographical coverage and feasibility. A preliminary secondary data and literature review was conducted in order to define the structure of the study. Safeguarding a mixed method approach of the Link NCA methodology, a preference was given to the qualitative data collection, complementing it with analyses of existing FSNAU datasets for both Gu and Deyr seasons spanning from 2014 to 2020.

After a validation of Terms of Reference and a reception of an ethical approval on 4th November 2020[10], the study team proceeded with a systematic literature (using the *Link NCA Pathways to Undernutrition* module and all grey literature available locally), supported by a series of exploratory interviews with key informants, such as representatives of relevant governmental institutions and non-governmental organisations with an in-depth knowledge or work experience in the study zone. The aim of the exercise was to identify a set of risk factors and their interactions, which might trigger undernutrition among the target population. The identified hypothesised risk factors were presented, examined and validated for field testing during the Initial Technical Workshop, organised via a teleconference on 13th December 2020. Considering its specific virtual format (in contrast to a standard in-person event), the Initial Technical Workshop was preceded by an online consultation of key stakeholders via a Survey Monkey questionnaire, which took place between 17th November and 7th December 2020. A total of 32 participants from 24 organisations, including Federal Ministry of Health (FMoH), Gedo Region, UN agencies and a variety of local and international NGOs.

Out of 25 hypothesised risk factors, 17 were retained for field-testing. Technical Experts were invited to categorise risk factors according to their anticipated contribution to wasting in the study zone of study on the scale from minor (risk factor expected to contribute marginally to undernutrition) to major (risk factor expected to contribute substantially to undernutrition). The results of this exercise are presented in the table below, with those anticipated to contribute most significantly to undernutrition causality represented in red and those expected to contribute most marginally to undernutrition in green.

Validated hypotheses	Literature review	Online consultation	Link NCA SO 19[4]
Hypothesis A - Limited access to health services	++	30%	++
Hypothesis B- Low birth spacing/ early, repetitive or unwanted pregnancies	+++	65%	++
Hypothesis C - Low birth weight	++	45%	++
Hypothesis D - Low nutritional status of women	++	75%	++
Hypothesis E – Caregiver well-being	+	75%	+
Hypothesis F - Non-optimal breastfeeding practices	+++	80%	++
Hypothesis G - Non-optimal complementary feeding practices	+++	70%	++
Hypothesis H - Low quality of interactions between a child and a caregiver	+	40%	++
Hypothesis I - Low access to quality diet	++	54%	++
Hypothesis J - Low access to income sources	+++	70%	+++
Hypothesis K - Malfunctioning market or supply system	++	15%	+

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[9] For more information about the methodology, please refer to www.linknca.org.
[10] Reference No: MOH&HS/DGO/1340/Nov/2020.

Hypothesis L - Low coping capacities	++	35%	+++
Hypothesis M – Inadequate accessibility, availability and quality of water at household level	+	70%	+++
Hypothesis N - Poor sanitation practices	+	85%	N/A
Hypothesis O - Heavy workload of women	++	25%	+++
Hypothesis P - Low female autonomy/ decision-making	+++	20%	+
Hypothesis Q - Low social support for women	+++	90%	N/A

Table 1: List of hypothesized risk factors validated for field-testing during Initial Technical Workshop, including rating on the basis of a literature review, online consultation and a comparison with a similar setting in Kahda District

B. Primary data collection (April – May 2021)

The qualitative study lasted four weeks, spanning from 1st April 2021 to 2nd May 2021. It comprised of an in-depth inquiry on all risk factors identified and validated in preceding stages through semi-structured interviews and focus groups discussions as two principal data collection methods.

Qualitative data collection

Sampling framework

The objective of the qualitative study sampling framework is not to be statistically representative of the target population but rather to be qualitatively representative of different population segments. In order for the collected qualitative data to represent realities of a majority of households, a purposive sampling was used to select the villages. Particular attention was paid to the representativeness of the communities surveyed.

Settlement	Section/Blocks	Justification
Kabasa	Section F - Block F1 - Block F2	One of the oldest settlements in Kabasa with populations that have better integrated and thus have access to labour opportunities. Certain residents have access to the WFP rations while access to nutritional services is generally better. They have shelters in a better condition and though rates of malnutrition are generally higher in Kabasa, the rates are relatively lower in Section F. The Section has poor planning compared to the other Sections and latrines are largely closed, increasing risk of contamination.
Kabasa	Section BB - Block BB 9 - Block BB 12	As one of the newest Sections, it has the largest population in the IDP settlement consisting of 12-13 blocks with about 800 households. It is inhabited by the population that were displaced by drought and insecurity in Bay and Bakool region. Although they have access to a hospital, access to schools and WASH services is much lower compared to the other Sections. Most of the shelters are *Buuls* (temporary makeshifts) and higher levels of malnutrition were reported in the Section.
Qansahley	Section 5 - Block 5-1 - Block 5-2	An old Section sheltering the host community as well, and therefore benefitting from better relations and access to opportunities in the town.
Qansahley	Section 20 - Block 20-1 - Block 20-2	Mostly inhabited by returnees from Kenya and Sudan, as well as drought and conflict displaced populations from Bay and Bakool. The Section lacks most facilities including water kiosks while the market is farther away and even the educational facilities are at a distance (20-25 minutes away).

Table 2: Qualitative sampling framework for the Link NCA Qualitative study, Dollow Somalia

At block level, the following categories of participants were selected to participate in semi-structured interviews and focus group discussions:

a. Community leaders (clan chiefs, town chiefs, town elders, religious leaders and other prominent community figures);
b. Traditional healers or birth attendants;
c. Health centre personnel (doctors, nurses, health extension workers);
d. School directors or teachers;
e. Representatives of community-based organisations;
f. Mothers and fathers of children under 5 years of age;
g. Grandparents of children under 5 years of age

h. Key government staff and staff of consortium partners

Sample size

Village	Focus group discussions/ Participatory exercises	Semi-structured interviews	Observations	Community restitution	Days	Total no. participants	Female participants
Kabasa Section F, Block F1/F2	8	8	4	1	6	72 (+15*)	30 (+7*)
Kabasa Section BB, Block BB 9/12	8	6	3	1	6	70 (+ 12*)	24 (+4*)
Qansahley Section 5, Block 1-2	8	7	4	1	6	71 (+ 17*)	29 (+ 6*)
Qansahley Section 20, Block 1-2	8	8	3	1	6	72 (+14*)	28 (+ 4*)
TOTAL	32	29	14	4	24	285 (+58*)	111 (+21*)

* Number of participants per community restitution.

Table 3: Summary of community consultations during the Link NCA Qualitative study, Dollow, Somalia

The qualitative team spent approximately 6 consecutive days in each selected community. The length of semi-structured interviews or focus group discussions was limited to 1h or 1h15min maximum. Focus group discussions took place in the mornings and at the beginning of the afternoon, in order to accommodate the community's availability and fit in with their daily routine.

The last day of data collection in each sampled community was dedicated to a restitution of findings to community representatives with an objective to seek their feedback on the interpretation of collected data and, more importantly, to engage them in a design of community-based solutions for identified problems and their prioritization.

Data collection tools

The qualitative study team used semi-structured interviews and focus group discussions as two principal data collection methods. However, in order to avoid information bias due to a long history of humanitarian interventions in the zone and a community dependence on external assistance, the qualitative survey team used a variety of participatory tools, with the aim of revealing the real determinants of undernutrition in the area. The selection of participatory tools included:

A. Historical calendar
B. Seasonal calendar
C. Ranking
D. Storytelling
E. Daily activities chart
F. Meal composition chart
G. Household expenses
H. Health journey / Therapeutic itinerary
I. Agree/disagree game
J. Courage to change game
K. Risk game

Semi-structured interviews and focus group discussions were guided by interview guides, covering key topics related to risk factors validated during the initial technical workshop. The content of the interview guides took into account available findings for the study zone and instead of repeating certain inquiries, it aimed to deepen the understanding about individual risk factors and their interactions in the zone of study. For more information about the qualitative study methods and tools, please refer to the Qualitative Study Guide in Annex E.

Team composition and training

Data collection was led by a qualitative researcher with the help of an associate researcher, one female research assistant and a community facilitator. A community mobiliser, usually a community health worker, was recruited locally at sector level. The main role of community mobilisers was to ensure equitable selection of participants for each focus group discussion in coordination with community leaders and to carry out any support functions, as needed.

Prior to the commencement of data collection, team members received a detailed 1-day briefing with the Link NCA Technical Advisor, which took place via teleconference on 26th March, 2021. A two-day training for the research team covering the survey methodology and tools as well as a detailed explanation of ethical considerations to be respected during the study was also conducted.

Main challenges

The study data collection was implemented as planned, as all of the researchers were of Somali descent, with an excellent understanding of the local context. They were therefore able to manage data collection in a complex and insecure environment. As the IDP settlements have been dependent on humanitarian aid for a long time, managing the high level of expectations and assessment fatigue were challenging. The study team worked closely with local actors and stakeholders, taking time to clearly explain the objectives of the Link NCA and they gained credibility through consistency in their approach and information shared with stakeholders. To ensure the quality of data collected, the team triangulated the findings from several sources with daily feedback and discussion of the findings.

C. Secondary quantitative data analysis (April – May 2021)

FSNAU datasets were available for both Gu and Deyr seasons spanning from 2014 to 2020, with the exception of Gu 2014, where sufficient data was not available for analysis. Data for each survey included a range of information on child (6-59 months) anthropometrics and health status, household food security situation and dietary diversity as well as household coping strategies, mother's MUAC and health and education status. However, the exact indicators differed by survey as the original primary purpose of data collection was to inform FSNAU analysis.

Upon reception of data from FSNAU, the datasets were cleaned and standardised. This involved standardising the naming of variables across surveys. Data, which did not fit within defined categories within the survey questionnaire was coded as missing (e.g. boy=1, girl=2, instance of 8 found in data=set to missing).

WHO flags were applied to find outlier data. The number of observations (children 6-59 months with relevant information available) and WHO flags applied is as follows:

Year	Sample	Deyr			Gu		
		WHZ	HAZ	WAZ	WHZ	HAZ	WAZ
2014	Final included	827	833	833			
	WHO flags	6	2	0			
2015	Final included	714	715	715	861	867	866
	WHO flags	1	1	0	7	1	0
2016	Final included	706	707	707	633	631	636
	WHO flags	1	0	0	3	5	0
2017	Final included	576	576	576	623	623	622
	WHO flags	2	2	2	0	0	0
2018	Final included	709	710	710	626	625	627

	WHO flags	1	3	0	1	2	0
2019	Final included	597	598	598	659	660	660
	WHO flags	1	1	0	1	0	0
2020	Final included	622	621	624	613	611	615
	WHO flags	3	4	1	2	4	0

Table 4: Summary of observations and WHO red flags

Both logistic and linear regression were undertaken to determine the associations between various risk factors and child nutrition status, taking into consideration survey design. Where possible, data was coded to 0 and 1 to enable logistic regression. Where number of assets were recorded, this was recoded as having any a given asset (1), or no asset (0). For number of polio shots received, this was coded as any shots received (1), or no shots received (0). For amount of household savings, this was coded as has any savings (1), has no savings (0). For the amount of wages per day per household member was coded as less than two thirds of the mean (1), or above (0). Household size was coded as equal or above the mean (1), or below (0), amount of cash received for various occupations among household members was coded as any income from occupation (1) or none (0).

Where any one variable had less than 5 responses in any one category, analysis was not undertaken due to insufficient number of observations. For continuous variables linear regression was undertaken. Due to differences in the exact set of questions asked in surveys on coping strategies of households, it was not possible to create a standardised index such as the reduced Coping Strategy Index (rCSI) for comparison across surveys.

Where variables were available across more than three surveys, variables were combined into a single analysis to identify risk factors over the time. The size of the standard errors were adjusted for the inclusion of data from different time points by including time (year, season) as a factor variable in the analysis.

C. Synthesis of results (June-August 2021)

Upon completion of the data collection stage, all collected data sets were duly analysed and triangulated in order to categorise risk factors according to their relative impact on undernutrition in the study zone. The categorisation of risk factors took into account all sources of information collected in the course of study. The results were presented to key decision-makers and operational partners during the course of the Final Technical Workshop, organised via a teleconference on 30th August 2021.

▪ **Data management and analysis**

The qualitative data was recorded manually in a notebook and reproduced electronically at the end of each data collection period in a sampled community. The data was grouped by themes for a more efficient analysis, making sure that a confidentiality of speakers is guaranteed. All views were then analysed using qualitative content analysis methods.

The quantitative data was analysed with STATA software. The anthropometric data was analysed using ENA for SMART software (2020 version).

▪ **Ethical considerations**
The following provisions were respected during the course of the Link NCA study:
a. All relevant authorities, including the Ministry of Health, were duly informed about the study by UNICEF and Action Against Hunger Country Offices in Somalia;
b. The participants were selected equitably and their informed consent was sought to ensure that they participate in the study voluntarily;

c. The participants of a qualitative study were able to participate in more than one focus group discussion, if they chose to, but considering their heavy workload, community leaders were advised to spread the selection of participants across the whole block;

d. The community leaders were informed of the selection of their community for the purpose of a qualitative study at least two days in advance. During community entry, they received a detailed planning of research activities in their block in order to facilitate the participant selection process and ensure the participants' availability at stated times. The detailed planning was subject to change, if required by community members. The qualitative data collection team accommodated to their routine as much as possible, taking into account time constraints of the study;

e. The anonymity of participants was ensured during all stages of the study (data collection, data analysis and data storage). Their names were neither collected nor shared;

f. The qualitative data collection team organized a community wrap-up discussion during the last day of the data collection in order to allow communities to review their findings, rank identified risk factors and prioritize actions for the way forward;

g. All children aged 6 – 59 months who were identified as suffering from severe acute malnutrition and/or other medical condition were referred to the nearest health facility for appropriate treatment.

Study limitations

- Unavailability of certain key Link NCA standard indicators- While the use of FSNAU datasets represented a valuable insight into the evolution of risk factors across seasons over the course of several years (2014-2020), the datasets did not include all indicators used during a Link NCA exercise involving a primary quantitative data collection. For this reason, certain risk factors could not be sufficiently triangulated due to missing analyses. Consequently, the categorisation of these risk factors was impacted as they generally ranked lower than other risk factors, for which quantitative analyses could be conducted. Therefore, the interpretation of the categorisation of risk factors should be done with caution as the unavailability of data does not imply a lack of contribution of a respective risk factor to the undernutrition in the study zone. In such cases, available qualitative data should be duly considered to inspire informed decisions for nutrition-sensitive programming in the study zone.

- Statistical associations: It is advised to appraise statistical associations with caution as observed links do not necessarily prove the causality, while unobserved links do not mean that the causality does not exist. Correlations thus must be considered within a larger framework, triangulated with other sources of data, and as such can be used for a prioritization of current and future interventions. In the narrative of this report, all p-value associations of <0.05 are referred to as 'significant' associations with the outcome of interest, i.e. wasting, stunting or underweight with the intention of inspiring future research on the relationship between that risk factor and said nutrition outcome.

IV. FINDINGS

UNDERNUTRITION

SECONDARY DATA REVIEW

Indicator %	Jubaland	IDP Settlements	Nomadic Population
Severe wasting	5.0 [1.5-6.2]	2.8 [1.1-6.6]	11.7 (DHS 2020)
Moderate wasting	2.8 [1.1-6.6]	14.3 [4.6-36.8]	
Wasting	19.3 [10.4-33.2]	19.3 [10.4-33.2]	17.7 (DHS 2020)
Underweight	18.1 [9.4-32.0]		
Severe underweight	2.3 [0.3-14.3]	4.2 [2.3-7.5]	
Moderate underweight	15.7 [7.9-29]		

Table 5: Undernutrition trends, Dollow, Somalia[11]

The graph below demonstrates undernutrition trends, as captured by FSNAU data during Gu and Deyr seasons from 2014 to 2020. A gradual decrease of GAM rates has been observed since 2015 with regular spikes during Gu seasons, notably in 2017, 2018 and 2019.
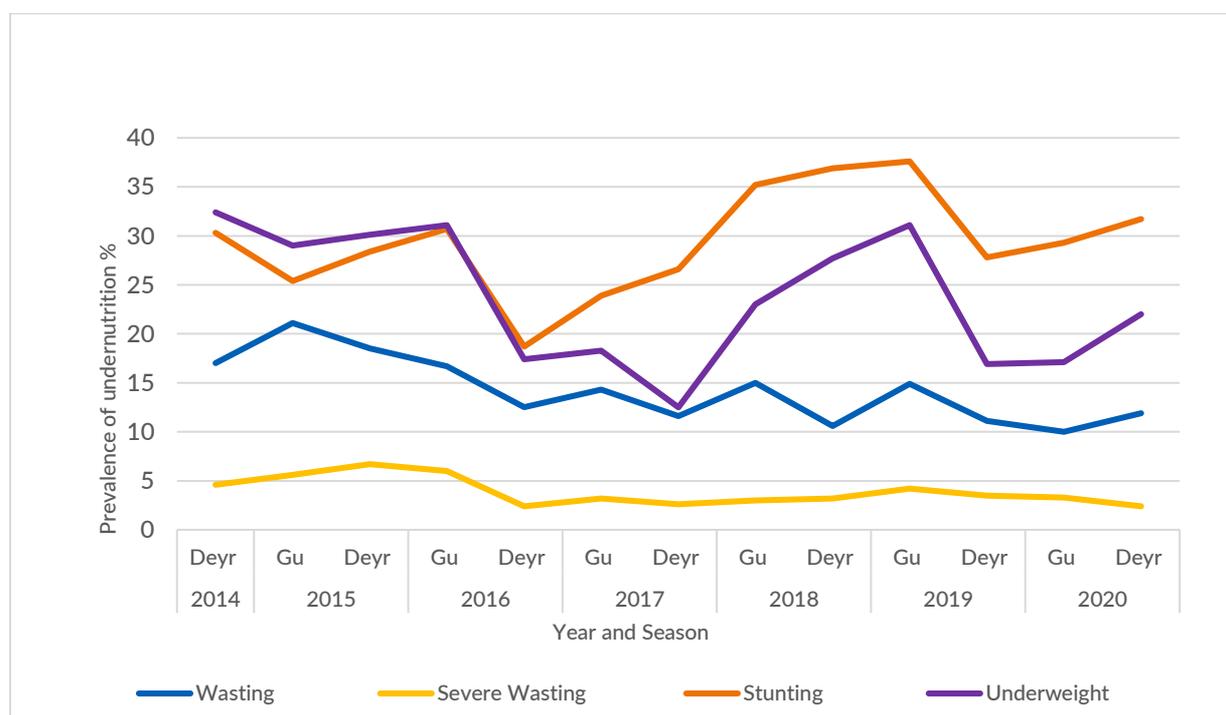
Figure 1: Undernutrition trends across Gu and Deyr seasons from2014 to 2020 based on FSNAU datasets, Dollow, Somalia

The stunting and underweight prevalence follow a similar pattern declining sharply in Deyr 2016 but rising steadily ever since when reaching a peak in Gu 2019. Another sharp decrease for both is observed in Deyr 2019, rising slightly to above 30% and 20%, respectively.

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[11] Ministry of Health FGS, FMS, Somaliland, UNICEF, Brandpro, GroundWork. Somalia Micronutrient Survey 2019. Mogadishu, Somalia; 2020.

QUALITATIVE INQUIRY FINDINGS

Community perceptions of undernutrition

Although there are several local terms for undernutrition, including *"maclul"*, *"nafaqo daro"* and *"dar galin la'an"*, the predominant term used is *"nafago daro"*. Kwashiorkor is referred to as, *'calool weynad or "barar'*, meaning big stomach and swelling, while marasmus was termed as *"maclul"*. Such children were said to have had inadequate access to food, have been sickly in their childhood or had a mother who suffered complications at birth or got sick during breastfeeding and thus was forced to stop breastfeeding her children. Children who refused to breastfeed *"nas diid"*, mostly children who were born premature *"dicis"*, were also said to be at higher risk of undernutrition. The FGD participants were able to correctly differentiate between the different forms of malnutrition and to identify the signs and behaviours of a malnourished child. A malnourished child was said to be thin *"caato"*, always crying, to have swollen eyes and yellowish hair, and took a longer time to learn to walk. Stunting *"fadiit"* was associated with poor diet, recurrent/relapsing diseases and a family history of having small and weak infants.

Local term in Somali	Meaning/translation
suban	diarrhoea
Ilkrow	tooth extraction
Tahlil	spiritual water
hagaa	winter dry season with temperatures reaching 86F, which spans December to March
isku nuug'	low child spacing
anjera	pancake
calool weynad iyo barar	big tummy/oedema
maclul	undernutrition
caata	thin
fadhiid	not able to walk
Isku nuug	low child spacing

Table 6: List of local terms used to describe undernutrition

A local NGO Community Empowerment and Development Action (CEDA) supported by UNICEF provides OTP and TFSP services in both Kabasa and Qansahley. The organization operated three fixed points centres (one in each of the settlements) and another within the CEDA Health Centre. Most of the referrals to the centre were either self-referrals, referrals by the mother-led MUAC groups or referred by trained community health workers. There were also anecdotes of mothers inducing diarrhoea in young children (e.g. by giving them detergents orally) in order to be registered in the feeding centres. The mothers then sold the nutritional support products such as PlumpyNut® in the market to meet the household food needs. A box of PlumpyNut® retails at USD 12 and is bought by local traders who either sell it to traders from Ethiopia from rural areas or within the settlement.

"It is good that you are looking at malnutrition more holistically. The risks and impacts of incomes and food on children is huge. I will always prefer preventive measures against malnutrition, rather than giving of PlumpyNut®, which in my opinion can even drive malnutrition as some mothers give their children detergents to induce diarrhoea so that they can get more children in the feeding programs and then sell the products in the market ".

Camp Leader, Qansahley IDP settlement, Dollow, Somalia

Community perceptions of causal mechanisms of undernutrition

The community perception of the causal mechanism of undernutrition is usually a lack of sufficient and nutritious foods as well as diseases and poor hygiene and sanitation practices. The mothers associated undernutrition with inadequate access to food by children and pregnant and lactating mothers alike. Households with better hygiene, sanitation and cleanliness and that had a mother present with the child were said to raise healthier children. Pregnant and lactating mothers, children under 5 years (with those less than 2 years being more vulnerable than the rest of the children), more so boys and children who failed to

breastfeed were identified as most at risk of undernutrition. Other perceived causes of undernutrition included poor access to diet diversification/unbalanced diets such as the consumption of cereal-based food with an inadequate intake of milk and meat in a household. Inadequate dietary intake by household members was mentioned as a risk factor for both pregnant and breastfeeding women and children under 5 years of age.

"A child whose mother has been sick and had to work during pregnancy, has no food at home, does not get adequate care and is unlikely to access services, will be likely be malnourished. Even after birth, a mother who is forced to run around between camps looking for assistance or looks for work in the town, is likely to have a sick child as they expose them to diseases and harsh temperatures".

<div align="right">Camp Leader, Qansahley</div>

The inadequacy of nutritious food was related more to inadequacy of incomes because of limited income earning opportunities, rather than lack of these foods in the market. To cope with inadequacy of incomes, mothers are forced to work for longer periods, which distances them from children. Households were also said to adopt inadequate coping strategies e.g. reduce food consumption to 2 meals per day, mostly of it cereals, and reducing meal portions, particularly for mothers. Although, household nutritional status was associated with their engagement in income earning opportunities, which would enable them to buy essential commodities, working mothers were said to have inadequate time and energy to adequately breastfeed children. Such child would also miss the parental care and interaction, which would consequently expose them to diseases. Mothers, whose husbands were working or who enjoyed other social support, had more time with children and were less likely to be malnourished.
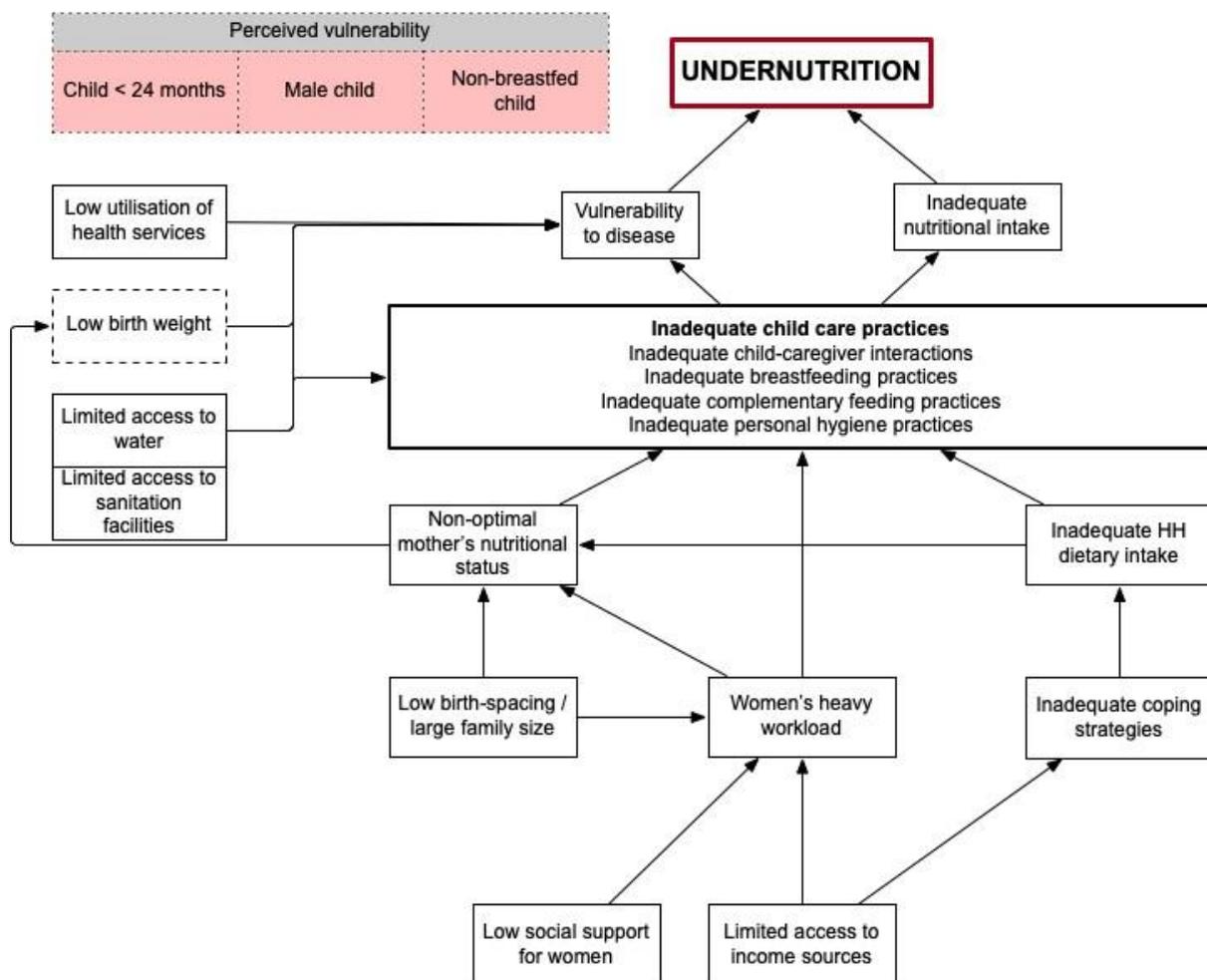
Figure 2: Community perceptions of causal mechanisms of undernutrition, Dollow IDP settlements, Somalia

Other than maternal workload, practices such as non-exclusive breastfeeding or a lack of breastfeeding as such, poor child spacing, large family sizes were also identified as risk factors of undernutrition. Mothers were seen as overburdened by frequent cycles of pregnancy and breastfeeding with too many children under 5 years seeking their attention. As such they were weak and fatigued; their nutritional status exacerbated by inadequate nutrition during pregnancy giving birth to underweight children, vulnerable to diseases. Once born, child illnesses, such as diarrhoea, measles, and malaria, were said to increase the risk of malnutrition for children in the IDP settlements. These diseases were associated with seasons, unhygienic environment, consumption of contaminated water, and children exposure to hazards such as mosquitoes, poor feeding and hygienic practices, failure to seek health services and failure to immunize children. Inadequacy of hygiene practices was said to result from inadequacy of water available in the household as well as challenges with accessing sanitation facilities – children in the settlements engaged in open defecation.

Seasonal & historical variations

The Manager at CEDA Health Centre reported that caseloads at facilities usually increased during the dry season, when income opportunities and food become scarcer due to a reduction in income-earning opportunities for IDPs. According to the Facility Manager, the incidence of malnutrition was highest among IDPs from Bay/Bakool who were said to be poorer, had larger household sizes and more children under 5 years of age. In addition, their background in farming makes it harder for them to withstand a new life arrangement in the IDP settlements, where food access is limited. In contrast to other groups in the settlements, IDPs from Bay/Bakool do not benefit from strong social networks who would provide additional support, when needed. The second most vulnerable group are pastoral dropouts from Gedo region, i.e. households that have abandoned their pastoralist lifestyle and settled in the IDP settlements and/or adjacent villages. Returnees from Ethiopia (in Qansahley) and those displaced from farming areas around Dollow were said to be less vulnerable to malnutrition due to their lesser numbers and easier access to income-earning opportunities. These findings were corroborated by camp management committees and health providers in the settlements.

As for the historical timelines of undernutrition, respondents noted that droughts, displacements and conflicts in the areas have resulted in an influx of new IDPs among whom the levels were higher. They highlighted the following events:

Date	Event
2011	Arrival of the first batch of IDPs in Kabasa following the worst famine in Somalia in 60 years (Daba deer)
2012	Outbreak of acute watery diarrhoea in Kabasa – Several NGOs started providing humanitarian assistance, particularly Danish Refugee Council that provided cash transfer locally referred to as *"karka suban biyoodka"*
2013	Major drought in Gedo resulted in the influx of pastoral dropouts from Gedo region into the IDP settlements. Also, refugees/returnees from Ethiopia
2014/2015	Jubaland State formation process started and in 2015 Bardhere was liberated from Al Shabab, but it resulted in displacement of populations to other districts in Gedo
2016	Arrival of returnees from Dadaab and Hagardhere
2018	Process of camp coordination and camp management and better organization of the settlements started with the support of IOM. Better services including water and sanitation were provided
2018	Conflicts in Oromia between Somalis and Oromos resulted in the return of large number of Somalis (who originally hailed from Gedo) in Dollow. They mostly settled in Section 20 in Qansahley
2019	An outbreak of acute watery diarrhoea occurred, but was less severe than the previous outbreaks as the humanitarian response was better.

Table 7: Historical timelines of shocks

QUANTITATIVE ANALYSES FINDINGS

Logistic regression of combined data (2014-2020) showed that male children aged 6-59 months were *more likely to be wasted* on the basis of weight for height z-score (p=<0.001) and on the basis of MUAC and/or weight for height z-score (p=0.017), *stunted* on the basis of height for age z-score (p=<0.001) and *underweight* on the basis of weight for age z-score

(p=<0.001) than female children. However, male children were less likely to be wasted on the basis of MUAC (p=0.005) compared to female children aged 6-59 months (Cf. Annex A: Combined Logistic Regression).

The vulnerability of male children towards wasting on the basis of weight for height z-score (p=0.012 and p=0.03, respectively) and on the basis of MUAC and/or weight for height z-score (p=0.037 and p=0.03, respectively) was most pronounced during Deyr season of 2014 and 2016 while they were less likely to be wasted on the basis of MUAC in Gu season of 2017 (p=0.037) and 2018 (p=0.005).

The higher likelihood of male children being stunted was observed during three Deyr seasons of 2015 (p=0.001), 2016 (p=0.041), and 2020 (p=0.024) while they were more likely to be stunted during Gu season, as demonstrated by data from 2015 (p=0.005), 2016 (p=0.005), 2018 (p=0.035), and 2019 (0.009) (Annex C: Logistic Regression).

Logistic regression of combined data (2014-2020) showed that children aged 24 months and under were more likely to be *wasted* on the basis of MUAC and on the basis of MUAC and/or weight for height, *stunted*, and *underweight* (all p=<.001) compared to children aged over 24 months. However, children that were aged 36 months and under were less likely to be *wasted* on the basis of weight for height (p=0.072) and on the basis of MUAC and/or weight for height (p=0.039) compared to children that were aged 36 months and over (Cf. Annex A: Combined Logistic Regression). Linear regression of combined data (2014-2020) demonstrated age as a risk factor for wasting on the basis of weight for height z-score (p=<.001) but a protective for wasting on the basis of MUAC (p=<.001) and for stunting (p=<.001) (Cf. Annex B: Combined Linear Regression).

The likelihood of children aged 24 months and under being wasted on the basis of MUAC was equally observed in both Gu and Deyr seasons from 2015 to 2020 (all p=<.001, 2017 Deyr p=0.03). Their likelihood of being stunted was also not preferably linked to a particular season, as shown by data from 2015 (Gu: p=<.001, Deyr: p=0.001), 2016 (Gu and Deyr: p=<.001), 2017 (Gu: p=0.004) and 2019 (Gu: p=0.016, Deyr: p=0.012). In Deyr seasons of 2014 to 2016, being aged 24 months or under was associated with being *underweight* (p=<.001, p=0.042 and p=0.017, respectively) (Cf. Annex C: Logistic Regression).

Children aged 36 months and under were more likely to be underweight and stunted, as shown by data in Deyr season from 2014 (p=0.008, p=0.006), 2015 (p=0.013, p=<.001) and 2016 (p=0.029, p=<.001), respectively. In Gu season, children aged 36 months and under were more likely to be stunted compared to children who were aged 36 months and over, as shown by data from 2015, 2016 and 2019 (all p=<.001) (Cf. Annex C: Logistic Regression).

Linear regression showed increasing age was associated with an increase in MUAC in Deyr season, as shown by data from 2014, 2015, 2016, 2017, 2019 and 2020 (all p=<.001), and an increase in child's height for age, as shown by data from 2014 (p=0.004), 2015 (p=<.001), 2016 (p=<.001), 2018 (p=<.001), 2019 (p=0.043) and 2020 (p=0.037). However, an increase in age was associated with a decrease in weight for height as shown by data from 2015 (p=0.041), 2016 (p=<.001), 2017 (p=<.001), 2018 (p=<.001) and 2019 (p=0.005). In Gu season, increasing age was associated with an increase in child's height for age, as shown by data from 2017 (p=0.075), and then with a stronger association shown in data from 2018 (p=<.001) and 2019 (p=<.001). However, an increase in age was associated with a decrease in weight for age, as shown by data from 2017 (p=0.033) and 2020 (p=<.001) (Annex D: Linear Regression).

HEALTH AND NUTRITION

The residents in IDP settlements in Dollow have access to several types of health facilities (Table 8), all which are entirely supported by NGO's who contribute to health workers' salaries, provide medical supplies, vaccines and medical equipment as well as supporting community

outreach and hygiene promotions. Within the Kabasa and Qansahley settlements, services are provided by the IOM supported health centres[12] in the settlement, all of which provide free services and are less than 15 minutes (one way) walk for the patients. These facilities provide out-patient services, immunization of childhood diseases, antenatal and postnatal care and maternity services among other that operate for 8 hours except the maternity wing that provides 24 hours services. The IDP population have also access to Trocaire supported Dollow General Hospital (DGH) and CEDA Health Centre (CHC) that provide 24 hours free services, and Al Huda Private Hospital (AH). Some referrals were sent to Dollo Ado (Ethiopia) and the Mandera County Referral Hospital (MCRH in Kenya). Also, several private pharmacies that dispensed over-the-counter drugs existed within the settlements and Dollow Town.

Health facility	Services and operational hours	Management system for facility
Kabasa Health Centre	This first point of contact health facility for IDPs in Kabasa provides primary healthcare services, including outpatient consultations, management of malnutrition, ante and post-natal clinics and maternity services. Most services are provided for 8 hours except maternity that is open for 24 hours	The facility is managed by a local NGO, Humanitarian Development Concern and the day to day operations are run mostly by trained and auxiliary nurses.
Qansahley Health Centre	Just like Kabasa Health Centre it is the main facility in Qansahley that provides outpatient consultations, management of malnutrition, ante and post-natal clinics and maternity services. Most services are provided for 8 hours except maternity that is open for 24 hours	Run by the ministry but supported by IOM with supplies and staff salaries.
CEDA Health Centre	Provides OTP and TFSP services in both Kabasa and Qansahley with three fixed points and a health centre.	The facility is managed by a local NGO CEDA but funded by UNICEF.
Dollow General Hospital	Provides both inpatient and outpatient services, delivery, antenatal and postnatal clinics, preventative services including immunization against childhood diseases such as polio, whooping cough, measles, hepatitis, diphtheria influenza and recently started COVID 19 vaccination.	Facility is owned and managed by the ministry and is equipped and funded by Trocaire, an international NGO.
Al Huda Hospital	A private hospital that provides both inpatient and outpatient services and laboratory facilities.	Managers by owners who are a group of shareholders.
Dollo Ado Hospital	A referral hospital that has both inpatient and outpatient services, maternity, antenatal and postnatal clinics, laboratory and x-ray services according to community members.	Managed and run by the Ethiopian Ministry of Health.
Private pharmacies	Provide sale of prescription and over the counter medicines.	Owned and managed by different individuals.

Table 8: Summary of available health services, management and operational hours for Dollow IDP settlements

COMMON CHILD MORBIDITIES

SECONDARY DATA REVIEW

▪ Children with diarrhoea and acute respiratory infection in the past 2 weeks → higher risk of wasting[13]

Major illness in children in Gedo region[14]	Prevalence
Fever/malaria	57.9%
Diarrhoea	34.2%
Cough/ARI	39.8%
Deficiencies in children	
Zinc[11]	5.0%
Vitamin A[11]	34.4%
Anaemia[11]	
Severe	1.5%
Moderate	20.5%
Mild	21.4%

Table 9: Prevalence of major child illnesses in Gedo region, Somalia

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[12] The Kabasa is run by a local NGOs, Humanitarian Development Concern, while the one in Qansahley is operated by the Ministry of Health.

[13] Environmental predictors of stunting among children under-five in Somalia: cross-sectional studies from 2007 to 2010, Damaris K Kinyoki et al, 2016.

[14] Trocaire, 2017.

QUALITATIVE INQUIRY FINDINGS

Community perceptions of common child morbidities (ARI, Diarrhoea, Fever, Malaria)

A healthy child was characterised as one who adequately breastfeeds, eats well, is aware of his/her environment, and plays with siblings. Common reported diseases included malaria, common cold/pneumonia, diarrhoea and dengue fever, whose occurrence was said to vary seasonally. Table 9 provides the local names, perceptions of the causes and management of the common child morbidities identified during the research.

Illness/local names	Perceptions about the cause of illness	Management of the illness
Diarrhoea (*shuban*)	Perceived to be caused by: • Eating or drinking contaminated foods or drinks • Inadequate hand-washing practices (not washing hands during critical times, i.e. before food and during food preparation) • Consuming food that is cold or was left in the open for long periods/overnight.	Managed usually by: • Seeking medical help or buying medication from pharmacy, • Salty water or lime juice. • Quran reading/*tahliil* (spiritual water)
Acute watering diarrhoea (*suban biyood*)	• Poor hygiene and the consumption of dirty water and food.	• Seeking medical help • Giving water with sugar and salt (homemade ORS), • *Tahlil* (spiritual water).
Fever (*qanda*)	• Mostly related to mosquitoes - children get malaria if they do not sleep under mosquito nets. • Illnesses, such as malaria, tonsillitis, pneumonia and blood infections. • Some immunizations were said to cause fever after being administered. • Food poisoning as well as teething for children.	• Seeking medical services, • Putting cold cloth on the child's forehead • Quran reading and *tahlil* (spiritual water)
Pneumonia (*kolbo aria*, *waranta*, or *qar jeex*)	Participants indicated that children can easily get pneumonia if: • Left in the cold without good clothes that cover the chest. • They also related with some infections e.g. following a bad common cold/flu	• Dressing child with warm clothing, • Applying black seed oil around the chest and body • Seeking medical services • Quran reading.
Measles (*jedaaca*)	• Caused and spread by wind/air and transmitted from other children with the disease.	• Vaccination helps prevent the diseases. • Seeking medical help • Quran reading
Whooping cough (*hiqleey*)	• Just like measles whooping cough is caused by bad wind according to the community and transmitted from other children with the disease.	• Vaccination helps prevent the diseases. • Seeking medical help • Quran reading.
Chicken pox (*sugur*)	• Seasonal outbreaks and transmitted from other children with the disease.	• Seeking medical advice • Quran reading

Table 10: Local names, perception of causes and management of common child morbidities

Mothers usually spot an unwell child during breastfeeding and as they are in close contact with the child, they then inform the father. The therapeutic itinerary was said to depend on the condition of the child, workload of the parent and household's financial situation, among other factors. The children can be taken to the MCH to seek treatment, but it was common for mothers to delay treatment and observe the child for few days to see, if the condition resolves itself. Also home-based remedies, such as spiritual water and black seed oil, were used during this period. As for the prevention of childhood diseases, mothers said they immunized their children, bathed children at regular intervals, prevented them from playing in stagnant water and dirty environment, and fed them nutritious foods and breastfed them regularly.

Seasonal variations

Common child morbidities, particularly outbreak of acute watery diarrhoea was associated with a seasonal increase of the risk of malnutrition, particularly during the *Gu* and *Deyr* rainy seasons. Similarly, regular outbreaks of whooping cough, small pox and measles were said to occur in *Hagaa*, windy dry season, while diarrhoea picked up during the dry season, *Jilaal*, from January – March. Malaria outbreaks were said to peak after rainy months, May – June in the

Gu season and November – December in the *Deyr* season when the vector mosquitoes increased.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Climate												
Rainy seasons Gu/ Deyr			+++	+++	+++					+++	+++	+++
Dry seasons Hagaa/ Jilaal	+++	+++	+++			+++	+++	+++				
Child illness												
Malnutrition	+++	+++	++						++	++		+
Diarrhoea	+++	+++	+++						++	++		
Malaria					+++	+++					++	+++
Pneumonia						+++	+++	+++				
Measles						+++	+++	+++				

Table 11: Seasonal calendar for predominant childhood illness in Kabasa and Qansahley IDP settlements, Dollow, Somalia

The occurrence of these diseases was also said to have increased when the households moved to the IDP settlements – the increased population contacts, poorer health, hygiene and sanitation in the settlements, and the precarious nature of livelihoods in the settlements were often said to cause the increased occurrence of diseases.

"In our villages of origin, we used to live in a clean environment; we had milk and adequate cereals. Children were given camel milk and adequately fed and with a clean heart peoples prayer were accepted. Here, thank God, we enjoy the security, but food is inadequate, we live in a small compound like a small herd of goats, and access to sanitation and other services is poor".

Focus group participants, Kabasa IDP settlement, Dollow Somalia

QUANTITATIVE ANALYSES FINDINGS

Children who had had diarrhoea in the past two weeks prior to data collection were more likely to be *wasted* on the basis of weight for height z-score (p=0.012), on the basis of MUAC (p=<.001) and on the basis of MUAC and/or weight for height z-score (p=<.001), *stunted* on the basis of height for age z-score (p=<.001) and *underweight* on the basis of weight for age z-score (p=<.001) compared to children who had not had diarrhoea in the previous two weeks, as shown by logistic regression of combined data (2014-2020) (Cf. Annex A: Combined Logistic Regression). Children with diarrhoea in Deyr season were more likely to be wasted on the basis of MUAC, as demonstrated by data from 2016, 2017, 2019 and 2020 (all p=<.001). Children with diarrhoea in Gu season were more likely to be wasted on the basis of weight for height z-score and/or MUAC, as demonstrated by data from 2015, 2016, 2017 and 2019 (p=0.01, p=0.01, p=0.005 and p=<0.001, respectively).

An association between children having diarrhoea and *stunting* was observed in Gu season, as shown by data from 2015 (p=0.004), 2016 (p=0.004) and 2018 (p=0.022). If children had diarrhoea in Deyr season, they were more likely to be *underweight*, shown by data from 2014 (p=0.021), 2016 (p=0.012) and 2019 (p=0.042) (Cf. Annex C: Logistic Regression).

Linear regression of combined data (2014) showed that an increasing number of days of diarrhoea was associated with a decrease in child's weight for height z-score (p=<.001), MUAC (p=<.001), height for age z-score (p=<.001), and weight for age z-score (p=<.001). Linear regression across the years showed that an increase in the number of days a child had diarrhoea was associated with a decrease in weight for age z-score, as shown by data from 2015 (p=<.001), 2016 (p=<.001), 2017 (p=0.088), 2019 (p=<.001) and 2020 (p=0.006) in Gu season (Cf. Annex D: Linear Regression).

Children who had had pneumonia in the past two weeks prior to data collection were more likely to be *wasted* on the basis of MUAC (p=<0.05) and on the basis of MUAC and/or weight for height z-score (p=0.001), *stunted* (p=0.003) and *underweight* (p=0.001), as shown by logistic regression of combined data (2014-2020) (Cf. Annex A: Combined Logistic Regression). In

Deyr season, children that had had pneumonia were more likely to be wasted, as shown by data from 2016, on the basis of weight for height z-score (p=0.011), MUAC (p=<.001), and MUAC and/or weight for height z-score, in 2017 on the basis of MUAC (p=0.001), in 2019 on the basis of MUAC (p=<0.001) and MUAC and/or weight for height z-score (p=0.004) and in 2020, on the basis of MUAC (p=<.001) and MUAC and/or weight for height z-score (p=0.042). The likelihood of children that had pneumonia on being wasted was equally observed in Deyr and Gu seasons, on the basis of MUAC and weight for height z scores, in data from 2015, 2016, 2017 in Gu and 2015, 2016, 2017, 2019 and 2020 in Deyr season.

Children that had had pneumonia were also more likely to be stunted in Deyr season, as shown by data from 2014 (p=0.008), 2016 (p=0.029), as well as underweight as shown by data from 2014 (p=0.021), 2016 (p=0.012) and 2019 (p=0.042). In Gu season, children were more likely to be wasted if they had had pneumonia as shown by data on the basis of MUAC (p=<0.001) and MUAC and/or weight for height (p=0.01) in 2015 and 2016, and on the basis of MUAC alone in 2017 (p=0.018) (Annex C: Logistic Regression).

Children who had had a fever in the previous two weeks prior to data collection were more likely to be *wasted* on the basis of weight for height z-score (p=0.003), on the basis of MUAC (p=<.001) and on the basis of MUAC and/or weight for height z-score (p=0.001) as well as *underweight* (p=0.019) compared to children who had not had a fever in the previous two weeks, as shown by logistic regression of combined data (2014-2020). In Deyr season, children that had had a fever were more likely to be wasted on the basis of MUAC in 2016, (p=<0.001), 2017 (p=<0.001), 2018 (p=0.041) and 2019 (p=0.005), and on the basis of MUAC and/or weight for height in 2016 (p=0.012), 2017 (p=0.041), 2018 (p=0.041) and 2020 (p=0.02) (Cf. Annex C: Logistic Regression).

Children who had had measles in the last two weeks prior to data collection were more likely to be *wasted* on the basis of weight for height z-score (p=0.037) and on the basis of MUAC (p=0.001) as well as *underweight* (p=0.02), as shown by logistic regression of combined data (2014-2020). (Cf. Annex A: Combined Logistic Regression).

Children who had had any morbidity in the last two weeks prior to data collection were more likely to be *wasted* on the basis of weight for height z-score (p=<.001), on the basis of MUAC (p=<.001) and on the basis of MUAC and/or weight for height z-score (p=<0.05), *stunted* on the basis of height for age z-score (p=0.031) and *underweight* on the basis of weight for age z-score (p=0.002), as shown by logistic regression of combined data (2014-2020) (Cf. Annex A: Combined Logistic Regression). Children that had suffered any morbidity in Deyr season were more likely to be wasted on the basis of MUAC, as shown by data from 2015 to 2020. A similar trend was observed during Gu seasons from 2015 to 2019 with the exception of 2017. They were also more likely to be underweight in Deyr seasons of 2016 (p=0.009), 2018 (0.091), and 2019 (p=0.008) (Annex C: Logistic Regression).

HYPOTHESIS A: LIMITED ACCESS TO AND UTILISATION OF HEALTH SERVICES

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	++
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	+++
Qualitative team rating	++
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	++

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[15] Based on "Pathways to Undernutrition"

[16] In case cross-sectional studies with statistical associations are available for the study zone. Otherwise, hypothesised strength of the association, if based on prevalence values.

[17] Statistical associations from the Link NCA quantitative survey and/or eligible secondary datasets.

SECONDARY DATA REVIEW

Barriers of access to health care

- *Geographical:* lack of transport[14]
- *Financial:* 62% of women cited lack of money as a hindrance to accessing health care[18]
- *Temporal:* long waiting time due to an upsurge of returnees/IDPs likely triggering pressure on limited health and nutrition services offered in health posts and mobile centres[14]
- *Socio-cultural:* Women fearing receiving family planning medication without notice, lack of privacy.[19]; absence of a link between religious leaders (RL) and community leaders (CL) and health service providers (HSPs)[8]
- *Quality of care:* lack of trained staff, insufficient number of female staff/midwives
- 25.6% of children 6-59 months received Vitamin A supplementation, most of them through outreach sites and health facilities[14]; Vitamin A supplementation → decreased risk of wasting[13]
- Only 8.7% of children received all three doses of Pentavalent vaccine, 48.2% did not receive any; 33.9% of children received the measles vaccine[14].
- 31% of women of reproductive age access antenatal care services[18]; 18.7% of pregnant women consumed multivitamin tablets; 17.2% consumed folic acid tablets/syrup[11]
- 79.1% of births in a home environment[18]; 89% of mothers do not receive any postnatal care[18]

QUALITATIVE INQUIRY FINDINGS

Barriers of access to health care

Geographical barriers

Participants highlighted that access to health services was much better in the IDP settlements compared to their villages of origin where facilities were limited and where they depended on traditional (Quranic) healers or drugs (mostly painkillers) purchased locally. As health centres were within the settlements, while the DGHs was within the town, there were no geographical barriers in accessing health services locally. However, for Dollo Ado, about 8 km away, the patients had to cross the Somalia – Ethiopia border to seek specialised services in MCRH, particularly mental health, while for other specialised services and surgeries, they had to travel to Belet Hawa, 45 km away and then cross the Kenya-Somalia border into Mandera. There were administrative issues in crossing the border as local authorities demanded local registration documents (identity cards) and patients had to incur informal fees (bribes) and taxi charges to cross the borders.

Financial barriers

In all the settlements, the IDP health centres were the first facility of choice, to which the residents either walked or used a wheelbarrow and donkey cart to transport the patient, if unable to walk. To access the better services at the DGH, people need to walk for 30-45 minutes from Kabasa or incur a cost of 10 ETB, alternatively or 20 ETB or walk for 1 hour from Qansahley. Although all the services in the health centres and at the DGH were free, referrals or services at the well-equipped Al Huda Hospital had an associated cost and therefore were less financially accessible. In addition, patients incurred some costs if they were hospitalised or if they purchased medicine that were out of stock. The financial costs for referrals to distant health facilities such as Mandera extended the cost of upkeep for patient and any accompanying relatives, cost of medication and hospitalisation, as well as transportation costs. In such cases, it was common for friends and relatives to support the affected family in raising

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[18] Demographic and Health Survey, Directorate of National Statistics, 2020 (DHS 2020).
[19] Ministry of Health Somalia & UNICEF, Qualitative Research Somalia, 2020.

funds to cover the fees, though in all the FGDs, participants showed that most of the relatives were themselves impoverished and therefore unable to help each other, explained by a Somali proverb. *"Two naked people cannot carry each other"*.

Geographical barriers
- Distance to the better equipped and services at DGH particularly for Qansahley which was 4.5 km from the town centre where DGH was located.
- Unreliability of ambulance services especially at night - only one ambulance serves the entire district

Financial barriers
- Though all the services are free, they incure transport cost of ETB 10 - 15 depending on the location - to the prefered DGH
- Cost of medication that are out of stock and upkeep for patients and relatives during hospitalization
- Transportation and other costs for referrals to other hospital outside of Dollow

Temporal barriers
- Parental committment and 8 hour operation of health centres in IDP camps conflict with parent availability to seek health services when less busy and at night
- The high dry season temperatures required parents to set out early morning which is peak time for casual labour opportunties and household chores

Socio-cultural barriers
- Inadequate support for mothers who have children to care for and a sick child in the hospital
- Heavy workload for women - competition between workload and care and health-seeking for sick children

Quality of care barriers
- Health centres only offered basic services and had some supply challenges forcing parents to purchase additonal medication
- Lack of medical equipment. such as oxygen in the maternity centres
- Technical capacities of midwives to manage complicated cases in the maternity centres

Figure 3: Summary of key barriers to health care, Dollow, Somalia

Temporal barriers

Parental commitment and engagement in income-generating activities was also cited as a barrier to accessing health care. The need to engage in these productive activities to support the household resulted in delayed treatment for the children. The health worker that was interviewed indicated that mothers delay seeking treatment for themselves or their children, especially during the day time when they were engaged in productive activities or household chores.

Most of the services in the health centres were offered for 8 hours except for maternity services, while the DGH operated for 24 hours. The opening hours were short considering that most parents were away during the day working and were available to take the children to facilities only in the evening when free. Unfortunately, access to the DGH at night was challenging because of distance, movement restrictions due to insecurity and a lack of transportation at night. Though providing free services, the single ambulance in the district was only available during daylight hours. Also, the temperatures in the dry season were very high which meant parents had to set off for the hospital early in the morning, which is peak time for household chores and work.

Socio-cultural barriers

Among the socio-cultural issues preventing optimal health seeking were the inadequate support for mothers caring for other children when in hospital with a sick child, as well as women's workload, which were said to result in mothers delaying seeking of treatment for themselves and children. Also, the language was said to be important in some cases as certain households from Section 20 in Qansahley travelled to Dollo Ado Hospital (Ethiopia) because they had a better understanding of Amharic and could communicate more easily with Amharic-speaking specialists in the hospital.

Quality of care barriers

Staff at the health facilities staff were said to be friendly and patient and spoke the local language which eased communication when patients sought services at the facility. They were supportive and welcoming, though the supplies in the health centres were said to be low. The community members demonstrated satisfaction with staff skills and experiences as well as their availability in health facilities. However, there was reservation about the quality of care in health facilities in the IDP settlements and hence the preference for patients to seek care directly at the DGH. The health centres were said to only provide basic services and had some supply challenges which meant that parents were forced to purchase additional medication. They also lacked adequate medical equipment. such as oxygen in the maternity wards and the technical capacity of midwives to manage complicated cases was limited.

Curative services

Treatment of common child morbidities

Common child morbidities are treated either in the health centres, by a traditional healer or by religious leaders reading the Quran and prescribing spiritual water. There was consensus that following the establishment of health centres in the IDP settlements, some IDP health needs are now being met better. The mothers indicated that there was preference of health services compared to traditional therapies. Health centres are the community's preferred first choice while both Kabasa and Qansahley IDP settlements have a fully functioning MCH supported by IOM. Aside from health centres, the community also calls on the services of traditional healers who specialise in fractures, removing milk teeth (*Ilkow*) which is believed to cause diarrhoea, fever, gum pains and itchiness. Traditional healers provide therapy using fire to treat conditions such as hydrocephalus (*madax weynad*) and jaundice (*cagarsho*), while religious leaders are usually called to read the Quran and give *tahlil* (holy water) to the child.

Childbirth

Children in IDP settlements are delivered in health centres, at the DGH or at home by a traditional birth attendant. Mothers mostly prefer the TBAs for reasons of familiarity or relation, interlinked with the cultural preference of privacy, as well as a lack of ambulance services at night. Sometimes, the TBAs accompany a young mother to the health facility to reassure them and to help the midwives. There was a unanimous agreement during the FGDs that women prefer to deliver at home, even though they acknowledge this as a 'risky' action. In fact, delivery was said to be *"similar to coming back from death bed"* and stressed the need to access skilled TBA and midwives at the time of the delivery.

Preventive services

Vaccination

All the health facilities in the IDP settlements as well as the feeding and therapeutic centres managed by CEDA were providing immunisation against common childhood illnesses, including tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis (polio) and measles which

the community can access free of charge. Awareness and sensitization campaigns are done 5 days a week by community health workers to increase the uptake of immunizations, deworming and other services. Health professionals that were interviewed indicated that immunization coverage in the IDP settlements was still low leading to seasonal outbreaks of diseases such as measles. They related the low coverage to vaccine hesitancy/refusal due to rumours and misinformation regarding its effects and missed opportunities to present children for vaccination because the mothers did not prioritise child immunization schedules as they were engaged in trying to earn incomes. The low vaccination uptake was also associated with low maternal education.

Deworming

As with vaccination, deworming tablets were available at all the health facilities as well as at the CEDA feeding centres. In the interviews, worm infestation was common in children consuming soil, contaminated water or contaminated food while signs were said to include loss of appetite, worms seen in the faeces and a distended abdomen. Although deworming tablets were available, the uptake was also low as the community did not perceive it to be a big problem in the settlements. Similarly, deworming of mothers during pregnancy was low as most of them missed their scheduled consultations due to the high workload. It was clear there was low awareness around the importance of deworming for pregnant women and its impact on maternal anaemia, although in general there was awareness of the broader need to improve the nutrition of pregnant women and its benefits related to birth outcomes. Nevertheless, parents were aware that children were more vulnerable to the effects of worms and the risk of anaemia and malnutrition if they were burdened by worms. A few misconceptions relating to deworming included rumours about the administration of birth control tablets alongside immunizations, deworming and vitamin A supplementation.

Vitamin A Supplementation

Simultaneous deliveries of vitamin A supplements with deworming tablets and immunization is practised, but like other interventions, the coverage is low. The existence of community health workers facilitated the simultaneous delivery of vitamin A supplements with deworming tablets, as they were safe to be delivered by non-health staff after training. Unfortunately, while the coverage is low, midwives in the IDP health centres reported that the prevalence of anaemia among women giving birth in the facilities was high, which forced them to refer the patients to the DGH for better management. UNICEF, IOM and Trocaire, either directly or through local partners, including Humanitarian Development Action (HDC), CEDA and Ministry of Health, lead in delivering vaccine supplies, deworming tablets and vitamin A supplements as well as other supplies, equipment and staff renumeration.

Antenatal care

The health facilities all provided antenatal and postnatal care and women reported attending these clinics when they had time. The mothers and TBAs indicated that the pregnant women had no problem with antenatal clinics, as they understood the benefits of attending them, but said the women could not follow the schedule for the attendance because of too many commitments at home and at work, with their daily routine making it difficult for them to access such facilities. As for their preference, mothers noted that female health workers were available and preferred during the visits.

Men confirmed that their wives attended antenatal clinics "*so that doctors can detect any problem early and remedial measures are taken in good time*". They said that they were ready to support their wives to attend these clinics whenever possible, but said it was the wife's mother or elderly relative who was much better placed to help in case there was a problem. At health facilities, it was observed that not all antenatal services or equipment were available. For

example, health centres did not have laboratory screening services, as they had a shortage of health care providers such as laboratory technicians. In addition, there was no formal system for tracing defaulters in the settlements, although some service providers reported engaging the mother support groups.

Postnatal care

Women highlighted that the period immediately after childbirth was critical to the survival and health of the mother and child. All the health facilities said they provided postnatal care to mothers who delivered in the facility.

Culturally, women stressed the importance of the 40 days period after giving birth referred to as *"umul bah"* a period of rest to allow the mother to recover. In this period, they were supported by their mothers or mothers-in-law who took care of the child, and were provided with better nutrition (enriched porridge, meat, offal and milk) depending on household income level. However, because of the burden of other responsibilities and the breakdown of family norms and limited resources within the family in the IDP situation, the period was now reduced. "*It is common for a mother in the 40-day period, attending to households chores and even looking for humanitarian assistance or work even after 10 days*", they said. For both antenatal and postnatal care, mothers in the FGDs reported that women were more likely to seek these services in the first pregnancy but not the subsequent ones, as they become more experienced and less fearful of delivery. Also, health providers noted that women who attended the ANC were more likely to give birth in the health facilities and thus utilize the PNC services in these facilities.

QUANTITATIVE ANALYSES FINDINGS

Children aged 6-59 months that received Vitamin A supplementation in the last 6 months prior to data collection were less likely to be *wasted* on the basis of MUAC (p=0.027) compared to children aged 6-59 months who did not receive it. They also had a slightly lesser chance of being *underweight* (p=0.059), as shown by logistic regression of combined data (2014-2020) (Cf. Annex A: Combined Logistic Regression).

Children that received Vitamin A supplementation in Deyr season were less likely to be wasted on the basis of MUAC as shown by data from 2015 (p=0.008), and 2018 (p=0.08). Data from 2018 showed that there was a slight association between Vitamin A supplementation and wasting, on the basis of weight for height z-score (p=0.025) and on the basis of MUAC and/or weight for height z-score (p=0.057). Therefore, vitamin A is identified as a protective factor for wasting (Annex C: Logistic Regression). In Gu season of 2019, children that received Vitamin A supplementation were less likely to be wasted on the basis of weight for height z-score (p=0.043) and stunted (p=0.003) and with a slightly weaker association with wasting on the basis of MUAC (p=0.081) and MUAC and/or weight for height z-score (p=0.057).

Logistic regression of combined data (2014-2020) showed that children who received a polio vaccination were less likely to be *wasted* on the basis of MUAC (p=0.004) than children aged 6-59 months who did not receive it. Children who received a polio vaccination in Gu season were less likely to be wasted, as shown by data from 2020, on the basis of weight for height z-score (p=0.016), MUAC and/or weight for height z-score (p=0.048) and MUAC, which is the same in 2019 (both p=0.092), as shown by logistic regression (Cf. Annex C: Logistic Regression) There was no comparable data for Deyr season. Therefore, polio vaccination seems to have a protective effect against wasting in Gu season.

HYPOTHESIS B: SHORT BIRTH-SPACING / EARLY, REPETITIVE OR UNWANTED PREGNANCIES

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+++
Strength of the association with undernutrition based on statistical analysis[17]	++
Technical experts' rating during Initial Technical Workshop	++
Community rating during qualitative inquiry	+
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	-
Overall interpretation	++

SECONDARY DATA REVIEW

- Average household size 6.2; nomadic households 5.3[18] → increases in the household size and number of children under 5 years of age (CU5) in the household associated with increased risk of wasting[13]
- Nationally, 39% of girls have first baby by 19 years of age[18] → marriage by the girl's 15th birthday a common social norm; married adolescent girls (AG) reported 16 years of age as an acceptable age at which to get married while AG who were not yet married suggested above 18 years as a good age for marriage to offset risks of early pregnancy[19]; older women favour child marriage as it allows women to have more children without concern for fertility[19]; increased risk of GBV in IDP settlements, partly driven by negative coping mechanisms to crisis, such as child marriage[8]
- 17% of women aged 15-49 years pregnant; 40.3% lactating[14] → increase in the age of the mother was associated with decreased rates of wasting[13]

QUALITATIVE INQUIRY FINDINGS

Average household size

According to residents in both IDP settlements, children are considered a blessing and a gift from God. The ideal family size comprises 8-10 children while households in Kabasa and Qansahley include 6 persons on average. The IOM camp coordination and camp management team similarly reported average households size of 6 persons in both settlements, although Kabasa had a larger population (10,320 households/60,459 persons) compared to Qansahley (4,000 households/23,998 persons). Though acknowledging the blessing, the communities also saw the burden of bringing up large families. Because of the economic situation, the trend of polygamy was decreasing while the numbers of divorces and women-headed households were increasing.

Early childbearing

Early marriages are rampant in the IDP settlements. An interview with the Sheikh at Kabasa highlighted the dilemmas parents face and reasons for early marriage and child-bearing. He noted that in all the settlements, women were giving birth before the age of 18 as girls were married off when young, which was driven by poverty and traditional attitudes towards ensuring sexual chastity of girls.

"In our villages of origin, we had less fears of girls misbehaving or getting pregnant before marriage and girls were only getting marriage at least at 16-18 years after having been trained by a mother or a grandmother. Now in the settlements with all the idle youth and working girls, we have fears and the girls are married off at younger age".

Religious Leader (Sheikh), Kabasa

In contrast, the returnees in the Section 20 Qansahley said they were less worried about marrying off their daughters early in the settlements compared to when they were in Ethiopia, as they felt girls faced less risk of unwanted pregnancies in the settlements. However, a

grandmother noted a belief among women that *"for every menstrual cycle the lady gets, if she isn't already married it is a sin on the part of the parent, so we marry them off when they start having their periods"*. It was implied that as most of the IDPs arrived from rural farming areas where early marriages are common, the practice persists in the IDP settlements and the community don't see it as a problem. Furthermore, with most girls not attending school and instead engaging in household chores, they are seen to be mature enough to have their own families.

Nevertheless, the FGD participants acknowledged a general impact on young girls' health status as well as childcare *"you will now find a child taking care of another considering that the practice of grandmother/mother supporting the young mother in the last trimester and birth is no longer possible with displacements into IDP settlements."*

Birth-spacing and family planning / Use of modern contraceptive methods

It was observed that given the high prevalence of early marriages and high fertility, women in IDP settlements, particularly Kabasa (more so among IDPs from Bay and Bakool compared to returnees from Ethiopia in Qansahley) were either pregnant or breastfeeding. Birth spacing, although desired by some women because of health benefits for the mother and child, was not practised. Breastfeeding was the commonest method used to achieve birth spacing but women were aware of low effectiveness. They said they *"hoped they would not get pregnant if the consistently breastfed, which itself is a challenge"*. As a result, the average spacing between children was one year, more so for women from Bay and Bakool region (majority of them in Kabasa) who were more conservative and traditional. The short birth spacing was also related to the continued presence of men in households compared to the villages of origin where men would be absent from the households for longer periods of time looking after livestock or working in distant farming areas.

"How do you expect the adequately spaced children when the husband is ever present and idle in the camp? Traditionally, men would absent herding, farming or working in other towns, but now he is at home 24 hours."

Grandmother, Kabasa IDP settlement, Dollow Somalia

As for the perceived risks relating to birth spacing, a risk game (Table 11) as well as courage to change game (Table 12) was used to explore the people's knowledge and attitude towards birth spacing and willingness to birth space, respectively.

Action	Kabasa	Qansahley
Young woman having a baby at 15 or 16 years of age	Not Risky	Not Risky
Woman having a baby at 30 years of age	Not Risky	Not Risky
Woman having a baby every 12 months	Risky	Risky
Women getting pregnant when breastfeeding a baby	Risky	Risky
Woman not attending prenatal care services at health centre	Not Risky	Risky
Woman fasting when pregnant	Not Risky	Not Risky
Woman working during pregnancy	Risky	Risky
Woman giving birth at home	Risky	Risky
Woman working after giving birth	Risky	Risky

Table 12: Community perceptions of risks related to birth spacing

As for barriers to child spacing, FGDs participants noted that information on the use of contraceptives was available in health facilities, but it was not a common topic. Therefore, misconceptions regarding the contraceptives persisted among the population. Also, as most of the women in the settlements were from a conservative rural background, there were strong religious beliefs against the use of contraceptives. Also, for socio-cultural reasons, women were reluctant to seek information on contraception e.g. the use of condoms and birth control pills as these were mostly associated with promiscuity and were said to encourage premarital sex. There were also perceived side effects of contraception, such as bleeding and an irregular menstrual cycle. The interviewed religious leaders opposed the use of modern methods of contraception with the intention of limiting the number of children, but accepted and

encouraged the use of breastfeeding for 2 years as a way of birth spacing. They also indicated that for spacing to occur, both husband and wife must consent to the decision.

Action	Kabasa	Qansahley
Having first child at 18 years of age	Difficult	Easy
Having children about two years apart	Difficult	Easy
Having less children	Difficult	Difficult
Use of different contraceptive means	Difficult	Difficult
Attending prenatal care at health centre	Easy	Easy
Not fasting when pregnant	Easy	Easy
Not working during pregnancy	Difficult	Easy
Not fasting during breastfeeding	Easy	Easy

Table 13: Community perceptions of behaviour change related to childbearing

Health workers indicated that modern contraceptives, particularly birth control bills were available in health facilities, but the uptake was low due to social and religious fears regarding their use. There were a few instances where contraceptives were used on the advice of medical professionals e.g. following caesarean births. The low birth spacing was associated with repeated "weakness" of the mothers, *"if the mother gives birth frequency, she will be too weak to breastfeed and take care of subsequent children. The very many small children will also tire her as they all seek her attention"*. Respondents acknowledged that low birth spacing was responsible for early child weaning and they were aware of the impact of this on the child's health and the link to malnutrition.

QUANTITATIVE ANALYSES FINDINGS

Children from above average-sized households (≥6 members) were more likely to be *wasted* on the basis of weight for height z-score (p=0.016) and on the basis of MUAC and/or weight for height z-score (p=0.016), as shown by logistic regression of combined data (2014-2020) (Cf. Annex A: Combined Logistic Regression).

Linear regression of combined data (2014-2020) demonstrated a slight influence (p=0.081) of mother's age on *wasting* in children aged 6-59 months as an increase in mother's age was associated with a slight increase in child's MUAC, as shown by data from Gu season 2015 (p=0.057) and 2016 (p=0.057) (Cf. Annex D: Linear Regression).

HYPOTHESIS C: LOW BIRTH WEIGHT

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	+
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	+

SECONDARY DATA REVIEW

▪ Only 16.3% children in Jubaland are weighed at birth; 72.4% of children weighed at birth had a low birth weight by card[11]

QUALITATIVE INQUIRY FINDINGS

Community perceptions of an "ideal baby"

According to FGD participants, an ideal child is a child that is healthy, playful, with a good build, always smiles, cries less, sleeps well and always smiles. However, women acknowledged that it was a challenge to have an 'ideal' baby in their current circumstance as IDPs since most of the facilitating parameters of the ideal baby such as adequate nutrition during pregnancy and

after birth, exclusive breastfeeding and good quality interactions between baby and mother were non-existent.

Community perceptions of low birth weight

Birth weight was not recorded neither at the health centre nor by the TBAs as it was not given much priority due to a shortage of staff and midwives and consequent reported high workload caused by a number of labours coming through. As such, the priority of medical staff was the wellbeing of the child and breastfeeding, including colostrum, rather than child's weight or a potential low birth weight[20] (LBW)

Women perceived that low birth weight children were born in instances where the mother received inadequate nutrition (lacked essential nutrients resulting in anaemia) or overworked during pregnancy to support the family. Other factors include mother being sick or giving birth to twins. Low birth weight was also associated with hereditary conditions as some families were observed to be naturally small in stature. Others alluded to premature birth (*dicis*) as a result of mothers not finishing their full-term pregnancy due to diseases or other factors. The perception that bigger babies would experience complications during child birth is something, which many younger mothers fear. Some associated the fear with Female Genital Mutilation (FGM) and the fact that no FGM reversals are done in the health centres locally. As for the consequence of low birth weight, mothers related it to the failure/inability to breastfeed and subsequent risks of poor health and failure to thrive in subsequent years.

QUANTITATIVE ANALYSES FINDINGS

No available data.

HYPOTHESIS D: MOTHER'S NUTRITIONAL STATUS

Strength of the association with undernutrition in the *scientific literature*[15]	+++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	++
Technical experts' rating during Initial Technical Workshop	++
Community rating during qualitative inquiry	+
Qualitative team rating	++
Strength of historical and/or seasonal variations on undernutrition trends	-
Overall interpretation	++

SECONDARY DATA REVIEW

- 9.2% of women in IDP settlements are underweight[11]; 8.9% of women of reproductive age have a MUAC less than 21cm[14]
- 47.4% of women are anaemic, 2.6% of women have severe anaemia[11]
- 5.1% of women in Jubaland have Vitamin A deficiency[11]; national folate deficiency 35.1%[11], national Vitamin B12 deficiency in non-pregnant women 36.9%[11]
- Women have concerns about gestational weight gain; taboos limit intake during pregnancy[19]

QUALITATIVE INQUIRY FINDINGS

Community perceptions of maternal malnutrition

"How do you expect a mother who has a maximum of one meal and works in casual labour to be adequately nourished."

Religious leader in Kabasa Block F1/2

The repeated cycles of pregnancy and breastfeeding coupled with increased women's workload, inadequate income and low access to nutritious food was said to take a huge toll on

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[20] Defined as birth at weight of less than 2500 grams.

nutritional status of women in the IDP settlements. At household level, it was observed that food distribution was generally distributed in an unequal way, with a mother usually accessing the smallest share of food prepared at home. Also, due to income, the mother did not consume adequate food groups such as fruits and vegetables while it was difficult to diagnose anaemia early due to the ANC non-attendance. Facility managers reported that it was common to find anaemic mothers and these cases were referred to DGH, which had better skilled staff and facilities to manage them. Unfortunately, the DGH had no blood bank and could only do limited transfusions.

Nutritional intake during pregnancy/breastfeeding

No special diet is prepared for children and pregnant and breastfeeding women - they are offered what is available to the family. The FGD participants expressed concern about the condition of pregnant and breastfeeding women who had poorly diversified diets. The poor nutritional status of women was confirmed by the health workers who reported that mothers will only come to the hospital if they were sick or if their infant was sick, and not to receive counselling on diets, as they were overburdened by other responsibilities. It was also remarked that the beliefs around different food/excluded foods for pregnant and lactating women, "*are no longer followed and people eat whatever they can access*".

"In most cases, the mothers who come to the health facility to deliver are anaemic. What do you expect of a mother who has to work to feed her children, earn about 2-4 USD per day, and still is last to fed in the family. They can't even afford to attend the clinics. For the serious cases of anaemia, we avoid delivering them in the health centre and refer them to the Trocaire Hospital".

Health workers, Kabasa

In the month of Ramadan, the sick, elderly as well as pregnant and breastfeeding women are exempt from fasting, so that neither their health nor their children suffer. However, the pregnant and breastfeeding women reported fasting while the latter group actively breastfed children. The implication of fasting in early pregnancy and while breastfeeding was that the breastmilk was depressed forcing the mother to supplement the child or wean early.

QUANTITATIVE ANALYSES FINDINGS

An increase in mother's MUAC was associated with an increase in child's height for age z-score (p=0.005), as shown by linear regression of combined data (2014-2020) (Cf. Annex B: Combined Linear Regression). Linear regression of data from Gu seasons showed that an increase in mother's MUAC was associated with a slight increase in child's weight for age z-score in 2015 (p=0.052) and 2016 (p=0.052), with an even stronger association with wasting on the basis of MUAC and weight for height z-score in 2015 (both years: p=0.01, p=<.001). There was also a slight association between mother's MUAC and child's MUAC in Deyr season in 2014 (p=0.052) and a stronger association in 2015 (p=0.017), with an increase in mother's MUAC associated with an increase in child's MUAC. (Cf. Annex D: Linear Regression).

MENTAL HEALTH & CARE PRACTICES

HYPOTHESIS E: CAREGIVER WELL-BEING

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	++
Community rating during qualitative inquiry	+
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	+

SECONDARY DATA REVIEW

- Minimal information and research on mental health for the population in the study zone but given decades of conflict, displacement and harsh living conditions, mental health is likely to be an underlying cause of a variety of phenomena in society.
- Nationally, 14% women aged 15-49 experienced physical violence since the age of 12; more than half of women believe husbands commit the most violent acts again women in the community (percentage lower in nomadic HHs compared to non-nomadic)[18]

QUALITATIVE INQUIRY FINDINGS

Community perceptions of caregiver well-being

While conflicts and displacements were said to affect women and young girls more, the women in the settlements feel continuously stressed about the access to food and therefore work or look for humanitarian assistance even during pregnancy or when lactating. With the breakdown of social systems, they have limited support. In addition, communities associate the mental diagnoses with the spirit world and witchcraft and hence a patient is withdrawn from the hospital and taken to a religious leader for spiritual healing. As noted by the Matron in DGH, most of the mental health patients are referred from the IDP settlements. He related these cases to stress and depression, *"the mothers suffered post-partum depression because of lack of support during pregnancy, difficulty in birth and other challenges"*. The matron also noted that mental health services were not locally available – the closest facility being Mandera County Referral Hospital. To travel to this facility, the patients had to incur the cost of seeking health services outside of the settlement, which required seeking permission from the camp administration, loss of a number of days at work, transport costs to distant facilities, and registration documents for Kenya or Ethiopia in order to cross the border.

QUANTITATIVE ANALYSES FINDINGS

No available data.

HYPOTHESIS F: NON-OPTIMAL BREASTFEEDING PRACTICES

Strength of the association with undernutrition in the *scientific literature*[15]	+++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+++
Strength of the association with undernutrition based on statistical analysis[17]	+
Technical experts' rating during Initial Technical Workshop	+++
Community rating during qualitative inquiry	+++
Qualitative team rating	+++
Strength of historical and/or seasonal variations on undernutrition trends	-
Overall interpretation	+++

SECONDARY DATA REVIEW

- Upward trend in national exclusive breastfeeding rates, but still very low: 15.6% in children <6 months in 2019, compared to 5.3% in 2009 → various soft foods and liquids such as water with sugar, honey, water and formula milk or camel's milk often introduced before the age of six months[19]
- 98.1% of children in South Central Somalia ever breastfed, 75% within one hour of birth, 94.4% are provided with colostrum, 21% exclusively up to 6 months. Median duration 17 months[7]; 55.1% of children breastfed at one year, 11.9% breastfed to 2 years[21]
- Mothers perceive pressure from their husbands to look beautiful, dissuading them from breastfeeding. Adolescent girls mentioned boys in their community didn't promote breastfeeding for as long as two years because they thought continuous breastfeeding would prevent another pregnancy and advised against the continuation of breastfeeding

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[21] Food Security and Nutrition Analysis Unit, 2015.

as they desired large families; religious leaders interviewed quoted the same verse from the Koran referencing continued breastfeeding to two years of age[19]

- Exclusive breastfeeding (EBF) is a challenge for young mothers and mothers working outside the home in particular months[19]; other barriers to EBF include perceptions: i) that the baby needs water to quench its thirst, ii) that breastmilk is too hot for the child to consume and thus the child needs water to cool them down, iii) that feeding children sugar water before the baby reaches six months is good for them, iv) that becoming pregnant while breastfeeding necessitates stopping further breastfeeding of the baby, v) that the mother has inadequate breastmilk, vi) that deliveries outside of the health facility lead to poorer infant feeding practices and vii) that traditional practices such as the application of black seed oil or honey to treat oral thrush interfere with optimal feeding practices months[19]

QUALITATIVE INQUIRY FINDINGS

Early initiation of breastfeeding

As recommended by UNICEF and WHO, women reported that they initiated breastfeeding within the first hour of life. According to the TBAs, though traditionally women used to believe that breastmilk was available after three days. The mothers and caregivers in the settlements were aware of the importance of colostrum and reported initiating breastfeeding within one hour of birth, but in some cases, pre-lacteal feeding with water or sugar water was said to occur to "quench thirst and help fill the child stomach". It was common to give "spiritual water" *tahlil* while the Sheikh in Kabasa indicated that some parents may give sweet food such dates or honey to the child. This increased the risk of exposure to contamination resulting in infant diarrhoea as well as unhygienic practices in food preparation and disposal of excreta. Unfortunately, the mothers were not aware of the risk of exposure to contaminants when giving infants water, which could easily result in infant diarrhoea.

Grandmothers were the main source of information on what children were given, considering that at first birth, young mothers were taken care of by their mothers or an elderly relative. Asked about the traditional practice of restricting consumption of colostrum that was previously reported among Somali mothers, all those interviewed indicated that this was no longer the case, they said *"the mother's milk is the best thing to give to the child when born"*. However, few young mothers still associated the consumption of colostrum with infant diarrhoea.

Non-exclusive breastfeeding

Exclusive breastfeeding was said to be very important for children and mothers were aware of its importance in child's health and nutrition. For most of the children, breastfeeding continued to up to 1 year to one year and 2 months (or anytime the mother discovered she was pregnant). However, the behaviour (EBF) is not practiced for several reasons. Women in both Kabasa and Qansahley do not exclusively breastfeed children and they breastfeed for a maximum of one year. The most common belief is that the quantity of mother's milk is not enough. This belief was perpetuated by older women or grandmothers who said *"the breastmilk is inadequate to meet the needs of the child"*, *"the mother's milk is too hot and children will become thirsty"*, or *"the child will have dry mouth and will cry"*. In all instances, mothers claimed that food was inadequate at the household level and therefore lactating mothers did not have good quality milk to meet the needs of the child. It was observed that the belief that breastmilk alone would not be sufficient to satisfy new-born hunger was one of the most important barriers to exclusive breastfeeding. Also, with work obligations and large numbers of children all seeking her attention, the mothers were said to discontinue breastfeeding.

In the barrier analysis, mothers who did not practice exclusive breastfeeding said that they did not produce enough milk, they gave water to quench child thirst, *mother's milk was hot, so child*

needed water, or they could not continue breastfeeding once they found they were pregnant. The cited negative consequence of EBF included baby not being satisfied and crying a lot. The participants noted that mothers, mothers-in-law and husbands generally approved exclusive breastfeeding, but they highlighted the challenges with work obligations in undertaking the same.

Pregnancy during the lactation period was another barrier to breastfeeding. Once the child has diarrhoea, mothers think they might be pregnant and stop breastfeeding). *"Breastmilk from pregnant mother is not good for the health of the child"* was often repeated by mothers and grandmothers, resulting in immediate suspension of breastfeeding. Also, if the mother feels sick, breastfeeding is suspended or stopped altogether due to the fear of transmitting the condition to the child. Other highlighted barriers included child illness (if a child has diarrhoea some mothers stop breastfeeding to stop the diarrhoea), in case of divorce and separation of mother and child, and in most cases working mothers often limited breastfeeding during work hours (also, breastfeeding the child when body was hot after long day work and working to the IDP settlements was associated with diarrhoea in children, so mother delayed breastfeeding).

Mothers were asked to rank the perceived level of risk of some common practices known to be present within the Somali community (presented in Table 13). There was consensus that children that have not been properly breastfed (during the first 6 months and up to 2-3 years) are more likely to be undernourished. Also, divorcees and mothers without support from husbands were said to be less likely to breastfeed children exclusively or more regularly.

Behaviour	Perceived risks	Community justification and additional information
When my baby is born, the first thing I give him to drink is water.	Low	A number of participants indicate that they believed some amount of water should be given to the child to quench thirst.
When my baby is born, I wash him and put him to sleep.	Low	Culturally, mothers believe babies are born with birth fluid and blood and therefore, should be bathed immediately after birth and wrapped up in warm clothing and put to sleep. This is believed to give the mother a chance to recover.
When my baby is born, I breastfeed him immediately.	Low	Mothers believe immediately after child birth there is no milk in her breast since it takes days for breast milk to form. As a result, other supplementary milk such as animal milk or powder milk is given.
When my baby is born, the first milk in my breasts is not good. I throw it away.	High	A number of participating mothers believe colostrum causes diarrhoea and is not good for the new-born child. As such, the first milk in the breast is thrown away.
When I breastfeed, I also give my baby some water because it is very hot and the baby is thirsty!	High	Culturally, mothers believe breast milk alone is not sufficient for the baby as it makes baby hot and thirsty. Therefore, water is given to the new born to mitigate the effect of thirst.
When I get pregnant, I stop breastfeeding.	High	As soon as mothers discover they have conceived, they immediately stop breastfeeding, as they perceive breastmilk of a pregnant woman is not safe and children will get sick if they are breastfed. The common illness they have associated is diarrhoea and stomach ache.
When I work, my milk is hot and I cannot breastfeed my baby.	High	A number of working mothers think when a mother is working her breastmilk is not safe. It was a common belief that since they are hot the breastmilk will also be hot and if taken will give the child food poisoning. Therefore, the mother will rest, have a bath and wait to cool down before she breastfeeds.
I start giving some food to my baby when he is 4 months old.	Low	Even though the majority of the interviewed mothers said they started supplementary feeding after 6-8 months, some participants saw no harm in giving soft foods such as mashed potatoes to babies. This was mostly practised by working mothers that are away from the child for long periods.

Table 14: Breastfeeding practices – Perceived level of risk of key behaviours

Median duration of breastfeeding

It was noted that mothers breastfed their child regularly (within every 2 hours) especially during the first 40 days, but the duration increased once the mother started attending to household chores. For children at pre-weaning stage, they were breastfed as needed as mothers always carried them on their back. The frequency and duration of breastfeeding were

also said to decrease for mothers who were working as engagement in these productive activities interfered with routine breastfeeding, interaction with the child (when left with siblings) and quality of complementary feeding. Taking the infant to work exposed the child to high temperatures and contaminants, to sick children in the households where the mother worked or in crowds at distribution points/registration for humanitarian assistance. Female headed households were the most affected by challenges related to interaction between the child, duration of breastfeeding and complementary feeding and workload.

It was observed that women in Section 20 in Qansahley did not engage in paid domestic work (previously from better income households and considered this as inferior occupation) compared to women from Bay and Bakool who commonly provided domestic labour in Dollow and Dollo Ado. Also, women who were also registered in the Ethiopian refugee settlements regularly travel to these locations and are away from their homes limiting the interaction with their children. Returnee mothers and those who operated small businesses in the market place said they were luckier as they were able to take their children to work without exposing them to extreme temperatures, they were able to let children take a nap at their workplace and ensure regular breastfeeding and complementary feeding.

Religious leaders, older women, TBAs and community health workers were important in passing on messages about breastfeeding. The religious leaders that were interviewed indicated that breastfeeding was a religious obligation, as the Quran supports breastfeeding for up to 2 years. They also observed that the Quran even allows fostering to ensure that the child is breastfed well, but it is not practiced among the Somali community.

QUANTITATIVE ANALYSES FINDINGS

The weaning age of a child, i.e. the age, at which a child stopped breastfeeding, was associated with a decrease in child's weight for height z-score, as shown by data from Gu season in 2015 and 2016 (both p=0.027), as well as height for age z-score (p=0.035) and weight for age z-scores (p=0.02) for both years. (Cf. Annex D: Linear Regression). There was no comparable data for Deyr season or data from the combined dataset.

HYPOTHESIS G: NON-OPTIMAL COMPLEMENTARY FEEDING PRACTICES FOR CHILDREN 6-23 MONTHS

Strength of the association with undernutrition in the *scientific literature*[15]	+++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+++
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	++
Community rating during qualitative inquiry	+++
Qualitative team rating	+++
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	+++

SECONDARY DATA REVIEW

- 71.2% of children 6-8 months introduced to solid, semi-solid, soft foods; 17.6% of children 6-23 months consume an adequate diverse diet[11]; 8.4% of children receive meal at minimum meal frequency, regardless of whether they are breastfed; 1.4% of children in receive minimum acceptable diet[7]; 85.2% of children are given animal sourced[7]
- Nationally, 15.7% of children 6-23 months consumed infant formula with added iron in the 24 hours prior to data collection[11]
- 50.6% of children with diarrhea are fed less than normal, 18.7% more than normal[11]

QUALITATIVE INQUIRY FINDINGS

Delayed initiation of complementary feeding

All the mothers interviewed indicated starting complementary feeding between 6 and 8 months, after which the child was expected to eat with other siblings resulting in them receiving inadequate portions. Sometimes, the mother fed the children separately, if the mother perceived the child was too young to feed on his/her own or ate less and therefore needed to be supervised. Animal/powder milk and food (porridge, softened (tea) pancake) was given alongside the breastmilk depending on household income. Interviewed health workers indicated the risk of introducing contamination through a feeding bottle considering the challenges with access to safe water.

Infrequent and non-responsive feeding

Maternal employment impacts children dietary intake as children are not fed all day long when mother or caregiver are away in search of humanitarian aid, employment and revenue. It was common for working mothers to leave the child with an older sibling, relative or neighbour. It was observed that women in Section 20 Qansahley who for most did not work, had better day schedule and were able to dedicate more time for childcare. They left behind some milk, tea or porridge, but older siblings always left the child unattended in dirty environment or forgot to feed them. Fathers said that they were not aware of what was given to their infants and considered it a women's role, though women said that good husbands would normally buy milk and other nutritious products for pregnant and lactating women, especially the younger ones.

Inadequate quality and quantity of complementary foods

The FGD participants noted that children were not getting adequate nutrition in their first a thousand days. They highlighted the inadequacy of complementary feeds due to inadequate incomes resulting in limited dietary diversity. Mothers said they gave the children "whatever is available", preferably animal milk, but in most cases were forced to give powdered milk, sugary water or tea. Livestock milk, which was most preferred, was not available locally with supplies coming from as far as Luuq as animals had moved further away from Dollow during the dry seasons. With 1 litre of camel milk retailing at USD 1.5 per litre, it was expensive for most of the IDP residents. They either consumed black sugary tea or gave powdered milk to children (with risks of contamination due to use of untreated water and diarrhoea for children).

After one year, the children were mostly offered food prepared for the family and no special recipe was prepared for them. Meal frequency was said to vary with incomes and work conditions of the mother and ranged from 2 – 8 times per day for children. There were also beliefs about feeding some foods to children before they were 2 years old e.g. giving eggs (usually raw eggs were given to children who had a common cold) was associated with asthma, while giving liver and kidney was reported to delay speech or make children deaf.

Inadequate feeding during illness

The FGD participants indicated that they cared for children more when they were sick by, for example, increasing the fluid intake or giving oral rehydration salts (ORS) to children with a diarrhoeal disease, but the food intake could sometimes be restricted. As indicated earlier, a mother would also restrict breastfeeding while the level of care and feeding during illness could also be affected by the mother's workload – illness of the child may force the mother to miss work, affecting the whole family income.

QUANTITATIVE ANALYSES FINDINGS

No available data.

HYPOTHESIS H: LOW QUALITY OF INTERACTIONS BETWEEN A CHILD AND A CAREGIVER

Strength of the association with undernutrition in the *scientific literature*[15]	+
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	+
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	+

SECONDARY DATA REVIEW

No available data.

QUALITATIVE INQUIRY FINDINGS

Inadequate child stimulation and activity

The interaction between mother and children was seen as valuable by respondents, although they acknowledge that large family sizes (mostly with a large number of children under 5 years of age competing for mother's attention) and a high workload detracts from this activity. As a result, for most children, the longest period of care and interaction with mothers occurred during the first 40 days after birth, after which the mother starts working and after one year a child is on his/her own, cared for by other children. They also observed that due to frequent deliveries, mothers take less care of children due to their own health-related complications during pregnancy and weakness caused by workload and attending to multiple children under 5 years.

Child care by other caregiver than a mother

The mothers are responsible for childcare and are assisted by grandmothers, relatives/neighbours and elder siblings of the child. Men are "*not heavily involved in daily child care practices*", although they help during times of maternal illness.

The practice of leaving children with siblings when a mother was away working was identified as common and "risky" because of failure/forgetting to feed the child or a risk of contamination of food, but it is also seen as a "necessity" considering that most women had no social support. In addition, women noted that there was a risk of exposure to diarrhoea either due to poor hygiene by young siblings or the use of contaminated water and unhygienic practices in preparation of the complementary foods.

QUANTITATIVE ANALYSES FINDINGS

No available data.

FOOD SECURITY AND LIVELIHOODS

HYPOTHESIS I: LOW ACCESS TO A QUALITY DIET

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	+++
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	++
Qualitative team rating	++

Strength of historical and/or seasonal variations on undernutrition trends	++
Overall interpretation	++

SECONDARY DATA REVIEW

- 61.9% of households are food secure with 17.1% being severely food insecure[11]
- Primary food sources include market, food aid and food gifts[2]
- Main energy sources: staples (46%), oil (14%) sugar (19%); nutritious foods provide 20% of dietary energy, mainly from meat (5%), milk (4%), fruit (4%), pulses (3%). Meeting energy needs is cheapest with commodities low in other essential nutrients, including protein, vitamins and minerals[22]

QUALITATIVE INQUIRY FINDINGS

Food expenditure

All households prioritised food expenditure, which were said to take up to 80% of the household income, followed by expenses on water, firewood, healthcare and education.

Meal frequency

Meal frequency is approximately 2 times a day for both adults and children (breakfast and supper) as shown in Table 15. All family members including children and adults have to contend with routine cereal-based meals which are consumed two times a day. Sometimes, children are given tea with milk (*shah caano'*) between the main meals.

Community	Breakfast	Lunch	Supper
Kabasa	Black tea, and occasionally Somali pancakes or local bread. For the poorest leftover of previous dinner is taken as breakfast	Soor (milled maize/sorghum) with sauce.	Soor (milled maize/sorghum) or rice with beans
Qansahley	Black tea, and occasionally Somali pancakes or local bread. For the poorest leftover of previous dinner is taken as breakfast	Commonly rice with sauce with few households having Soor (milled maize/sorghum) with sauce.	rice with beans or Soor (milled maize/sorghum) for few households

Table 15: Meal composition for all communities, Dollow IDP settlements, Somalia

Dietary diversity

As with IDP residents in other parts of Somalia, IDPs in Kabasa and Qansahley are chronically food insecure and depend on market purchases and food aid to meet their household dietary needs. Few households who had moderately malnourished in Kabasa benefitted from agricultural support by World Vision while some households in Kabasa reported being registered in the Somali refugee settlements in Ethiopia or having links with agricultural production areas in villages of origin in Bay and Bakool, from where they are supplied with cereals during harvest. However, the supplies from Bay and Bakool were subject to disruptions because of the insecurity in the production areas and transport routes.

Although food availability through external aid remains critical, IDP residents complained of the reduced levels of humanitarian assistance. They indicated that WFP was providing cash transfers to cover food needs – it provided USD 75 per household, which allowed the households to purchase 25 kg of rice, 25 kg of wheat flour, 25 kg of spaghetti and 3 litres of cooking oil that covered household food needs for 18-20 days. Other NGOs also provided some cash transfers and support.

When asked about food sources that are considered the healthiest and nutritious for the family the common response was, "foods of the animal origin such as meat and milk". These food sources, accompanied with fruits and vegetables were regarded to be, "good foods that provide vitamins for the body, especially women who have given birth". Access to these foods

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[22] Fill The Nutrient Gap Summary Report, Somalia, World Food Programme 2019.

was again attributed to level of income; in general, they were said to be available in the market, but inaccessible because of the low purchasing power of the households.

"We do not have access [to these nutritious foods]. Even the best among use can only afford offals or buy organ meat (intestines) in small quantities. The fruits are not consumed frequently."

FGD Participants, Qansahley

Seasonal variations

There were no significant variations in household diets seasonally, but access to food was said to be much more constrained in the settlements compared to their villages of origin when they were growing their food. IDP residents acknowledged that though their food sources did not change seasonally, income earning opportunities were seasonal. In addition, as well as normal lean seasons occur in the drier months of the year, households in Dollow IDP settlements have been impacted by increased food prices due to inflation, COVID pandemic and supply chain disruptions. Others have suffered displacements, death of family member or loss of employment, which limit the households' coping strategies/resilience.

"Compared to villages of origin, our diets remain the same of season, though milk availability improves during the rainy season. Previously, in the rainy season, we use to plant sorghum, maize and vegetables, and the animals were producing milk."

FGD Participants, Qansahley

QUANTITATIVE ANALYSES FINDINGS

Households that spent over 80% of earnings on food were less likely to have a *stunted* child (p=0.059) (Cf. Annex A: Combined Logistic Regression).

Children from households that consumed cereals in the last seven days prior to data collection were less likely to be *wasted* on the basis of MUAC (p=0.015), as well as less likely to be *stunted* (p=0.015) and *underweight* (p=0.03), as shown by linear regression of combined data (2014-2020) (Cf. Annex B: Combined Linear Regression).

An increase in days consuming organ meat was associated with an increase in height for age z-score (p=0.029) and in weight for age z-score (p=0.045), as shown by linear regression of combined data (2014-2020) (Cf. Annex B: Combined Linear Regression). Across the years, in Gu season, an increase in household consumption of organ meat in the past seven days prior to data collection had a positive influence on child's nutritional status, as shown by linear regression on the basis of weight for height z-score , MUAC, and weight for age z-score in 2015 (p=0.01, p=<.001, and p=0.003) and 2016 (p=0.01, p=<.001 and p=0.003), on weight for age z-score in 2017 (p=0.05), on height for age z-score in 2018 (p=0.045), and on height for age and weight for age z-scores in 2019 (p=0.005 and p=0.051) Children from households that consumed organ meat were less likely to be *stunted*, as shown by data from Deyr seasons of 2014 (p=<.001) and 2015 (p=0.037) but more likely to be stunted in Deyr season of 2019 (p=0.077) (Cf. Annex C: Logistic Regression).

However, an increase in days consuming flesh meat in Deyr season was associated with a slight decrease in MUAC in 2014 (p=0.091), in 2017 (p=0.035) and a decrease in child's height for age z-score in 2014 (p=<.001), 2015 (p=0.02) and 2019 (p=0.034). The counter-intuitive nature of this finding warrants further research.

An increase in the consumption of any meat in the last seven days prior to data collection was associated with an increase in child's height for age z-score in Gu season of 2018 (p=0.094) and more significantly in 2019 (p=0.001). In addition, a significant influence of household consumption of any meat in the last seven days on *underweight* was observed in Deyr season of 2014 (p=0.08), 2016 (p=0.089) and a stronger association in 2019 (p=0.016) as well as on

wasting on the basis of weight for height z-score (p=0.097) in 2016, (Cf. Annex D: Linear Regression).

An increase in household consumption of milk and milk products was associated with an increase in child's height for age z-score, as shown by linear regression data from 2014 (p=0.028), 2015 (p=0.015) and 2016 (p=0.046). It was also associated with an increase in child's weight for age, as shown by data from 2014 (p=0.028), 2015 (p=0.028), and 2016 (p=0.067) (Cf. Annex B: Combined Linear Regression).

Children from households that consumed eggs in the last seven days prior to data collection were more likely to be *wasted* on the basis of weight for height z-score (p=0.008) and on the basis of MUAC and/or weight for height z-score (p=0.01), as shown by logistic regression of combined data (2014-2020). There was a slight association between household consumption of eggs and being *underweight* (p=0.08). (Cf. Annex A: Combined Logistic Regression). The counter-intuitive nature of this finding warrants further research.

An increase in days consuming oils and fats was associated with a slight decrease in MUAC, as shown by the combined data (p=0.094). However, data from 2014 and 2015 showed that an increase in days consuming oils and fats was associated with an increase in height for age z-score (p=0.091 and p=0.038, respectively), and weight for age z-score (p=0.073 and p=0.06) in Deyr season.

An increase in consumption of legumes, nuts and seeds in Gu season was associated with an increase in child's weight for age z-score, as shown by data from 2015 (p=0.038), 2016 (p=0.038), 2018 (p=0.079) and 2020 (p=<.001), as was an increase in consumption of seafood, also in Gu season, as shown by linear regression of data from 2015 (p=0.068) and 2016 (p=0.068) (Cf. Annex D: Linear Regression).

Increasing household consumption of Vitamin A rich fruits in the past seven days prior to data collection was associated with an increase in child's weight for height z-score (p=0.044) and MUAC (p=0.019) in Gu season of 2015 and 2016 as well as child's weight for height z-score in Deyr season of 2014. (p=0.001) (Cf. Annex D: Linear Regression).

Households that consumed fruit in the last seven days prior to data collection were less likely to have a *stunted* child (p=0.022) (Cf. Annex A: Combined Logistic Regression). Increase in days consuming other fruits was associated with an increase in height for age z-score (p=0.027) (Cf. Annex B: Combined Linear Regression), particularly in Gu season of 2018 (p=0.009). Also, consumption of any fruit was associated with an increase in child's height for age z-score, as shown by data from Gu seasons of 2018 (p=0.018) and 2019 (p=0.044).

Data from Deyr seasons of 2016 and 2019 showed that an increase in household consumption of Vitamin A rich vegetables in the last seven days prior to data collection was associated with a decrease in MUAC (p=<.001), in height for age z-score (p=0.012) and weight for age z score (p=0.007). However, data from Gu seasons of 2015 and 2016 shows Vitamin A rich vegetables as a protective factor for wasting, on the basis of weight for height (both: p=0.088) (Cf. Annex D: Linear Regression). The contradictory nature of these findings warrants further research.

Household consumption of vegetables in the last seven days prior to data collection was identified as a protective factor for wasting on the basis of MUAC as well as for stunting (p=0.027) in Gu seasons of 2017 (p=0.014) and 2019 (p=0.039). (Cf. Annex C: Logistic Regression).

HYPOTHESIS J: LOW ACCESS TO INCOME SOURCES

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+++
Strength of the association with undernutrition based on statistical analysis[17]	+++
Technical experts' rating during Initial Technical Workshop	++
Community rating during qualitative inquiry	+++
Qualitative team rating	+++
Strength of historical and/or seasonal variations on undernutrition trends	++
Overall interpretation	+++

SECONDARY DATA REVIEW

- High post-harvest losses[22]
- Women are often low income earners, working long hours and surviving on unpredictable daily earnings[19]
- Nationally, mean remittances received in the past 3 months ranges from 100 USD in lowest quintile of wealth to 569.2 in highest quintile[11]

QUALITATIVE INQUIRY FINDINGS

Household income sources

The populations across both settlements have mostly pastoral and agro-pastoral background, with returnees from Ethiopia in Section 20 in Qansahley being engaged in trading alongside agro-pastoralism. In the IDP setting, the traditional skills such as animal husbandry and crop production were not useful as these livelihood options were limited. Nevertheless, few agricultural labour opportunities along with farmers engaged in share cropping with local landowners (*Bur Jubas)* existed. In sharecropping, the land owner and the IDP resident share costs of production and harvest (50%). While weather-based risks, such as flooding, affected incomes from sharecropping, the labourers earn between USD 250-400 in 4 months and are therefore able to feed their family better from daily sales of fodder and vegetables.

Others households depended on humanitarian assistance, petty trading and casual and skilled labour work in Dollow and Dollo Ado, earning about USD 6 per day, while some men were either idle, resigned and just stayed at home. Few were also engaged in the collection and sale of firewood and charcoal. Also, few households were receiving remittance of family members abroad, while few of those in Section 5 in Qansahley owned few livestock. Women were engaged in range of economic activities, including small business such as sale of vegetables, tea shops, Khat and other commodities, as well as casual labour doing household chores for other HHs generating a heavy workload. While the house helps earned an average of USD 50 per month, for daily wage earners average incomes for women was USD 3-4 per day. There is a competition for these opportunities from migrant labour from Ethiopia who charges less than the IDPs – USD 2 for daily labour for women.

A good number of IDPs in both Kabasa and Qansahley (except those returnees Eritrea and Ethiopia) were registered as refugees in the Dollo Ethiopia refugee settlements and travelled regularly to these settlements to access humanitarian assistance. Sale of humanitarian assistance was an important source of income, including PlumpyNut® and other products distributed by NGOs were available in the shops. A camp leader even reported "*women giving detergents orally to cause diarrhoea and qualify for the malnutrition support, so that they could sell the assistance for household income*".

A common theme across all the FGDs was the inadequacy of common income sources to meet the household needs. Income opportunities were particularly limited as a large number of unskilled workers both from the IDPs and migrant labour were competing for the few opportunities. While households with pastoral background were made redundant by limited demand for their skills in the urban centres, agro-pastoralists in Kabasa had better

opportunities in providing agricultural labour to farming areas along River Daua and Juba. The returnees in Section 20 had better doing small business (they operated small shops and restaurants that sold Ethiopian cuisine as well as Somali meals) and provided skill labour, especially in construction. Besides, they could cross the Somalia – Ethiopia border into Dollo Ado and engage in informal cross border trade. However, this group lacked networks required for accessing labour opportunities, especially in construction which was said to be "closed" for few individuals from the host community who recruited their relatives or IDPs known to them.

Decision-making with respect to finances was found to be made predominantly by made by the females. Respondents commented that larger decisions concerning healthcare and education are typically made jointly, in unison, by both parents. Women are often held responsible for the health of their children and that the men considered these activities as part of the 'women's roles', although the treatment seeking actions were, in most cases, influenced by both parents. The implication was that even with challenges in income, the mothers invested whatever was available directly in their family.

Land tenure

Households in both Kabasa and Qansahley were allocated a piece of land, on which they settled, by the local administration. After arrival in the settlements, the IDPs were allocated public land and following the camp planning supported by IOM, each household was allocated land measuring 8 x 6M, although plot sizes were observed to be bigger in Qansahley (15 x 15m) than Kabasa. Informal sales of these lands occurred, especially shelters at USD 400-500. It was observed that family plot sizes were much smaller in Kabasa (Kabasa BB) compared to other surveyed areas, measuring only 8 x 6m. *"Space was a challenge, especially when your latrine filled up"* said Kabasa BB chair, while getting allocated a new plot was difficult. As a result, even when a young man got married, "*he had to stay in the family plot, informally buy a plot with a shelter or use his networks to get another plot allocation in the new IDP sites*". As land ownership for agriculture was limited, although large population in Kabasa expressed desire to engage in crop production, as they possessed the skills, the access to agricultural land was much harder, only available through renting or sharecropping.

As for housing, households in Kabasa Section BB and about 40 households in Section 20 in Qansahley were supported by NGOs with corrugated iron sheet (Kabasa) and fibre glass (Qansahley) housing while few in Qansahley were provided with plastic sheeting by Horn of Africa Peace Network (HAPPEN). Also, returnees from Dadaab and Hagardhere (Kenya) who were resettled in both settlements had permanent housing constructed for them. However, the new arrivals were mostly accommodated in semi-permanent housing exposing them to extreme weather conditions.

Asset ownership

Asset ownership was low across all groups, though the situation was worse for new arrivals who had to set up their own shelters (where NGOs support was unavailable). It was observed that shelters in old IDP blocks in Kabasa and Qansahley were better compared to the new arrivals. Also, some of the households in Block 5 in Qansahley (some of who were from the host community) owned few livestock, which they grazed in surrounding pastures.

Seasonal and historical variations

The income earning opportunities were both limited and seasonal because of the smallness of the economy. The FGD participants reported that although both Dollow and Dollo Ado town were growing, there were significant changes in income opportunities as the number of people seeking them increased due to an increasing number of people arriving in the settlements due to displacements in their villages of origin as well as migrant labour from other parts of Ethiopia. Besides, seasonality in agricultural labour, especially in agricultural off-season, as

economy was pastoral/agro-pastoral based, income opportunities tended to be lower in the drier seasons of *Jilaal* and *Hagaa* seasons. Following the rains, agricultural labour opportunities were highest (in April – June, and October – December) while in the early stages of the rainy seasons (*Gu* and *Deyr*), the farming areas were prone to flooding, rendering farming areas and roads impassable and limiting casual labour opportunities in farming areas and in loading/unloading trucks transporting goods and produce (Table 15). The opportunities picked up during the harvest season, especially for lemons and onions and those who had stayed longer in Dollow and had established relationships and networks were better placed to get the few opportunities compared to the newly arrived IDPs.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Seasons												
Rainy seasons			+++	+++	+++					+++	+++	+++
Dry seasons	+++	+++				+++	+++	+++				
Income opportunities												
Casual labour	+++	+++	+++				+++	+++	+++			
Agricultural labour				+++	+++	+++				+++	+++	+++
Firewood sales	+++	+++	+++				+++	+++	+++			
Quarrying (in Qansahley)	+++	+++	+++				+++	+++	+++			

Table 16: Seasonal calendar of income opportunities, Dollow, Somalia

QUANTITATIVE ANALYSES FINDINGS

Logistic regression of combined data showed that children from households that had a primary income of petty trade were less likely to be *wasted* on the basis of MUAC (p=0.018), *stunted* (p=0.008,) and *underweight* (p=0.021). Children coming from households that received income from other sources were less likely to be *underweight* (p=0.039). Children from households that received income from casual labour were more likely to be *wasted* on the basis of MUAC (p=0.054). Children from households that received income from self-employment were less likely to be *wasted* on the basis of weight for height z-score (p=0.042) and with a slightly weaker association on the basis of MUAC and/or weight for height z-score (p=0.098). Children from households that received gifts were more likely to be *wasted* on the basis of MUAC (p=0.018) with a slight association on the basis of MUAC and/or weight for height z-score (p=0.095), *stunted* on the basis of height for age z-score (p=0.02) and *underweight* on the basis of weight for age z-score (p=0.032). However, children from households that received income from sales of camel and cattle were more likely to be *wasted* on the basis of weight for height z-score (p=0.033) and on the basis of MUAC and/or weight for height z-score (p=0.074), although the latter association was weaker (Cf. Annex A: Combined Logistic Regression).

Logistic regression of combined data (2014-2020) showed a significant influence of having land as an asset on the decreased likelihood of children aged 0-59 months being *wasted* on the basis of weight for height z-score (p=0.039), *stunted* on the basis of height for age z-score (p=0.042) and *underweight* on the basis of weight for age z-score (p=0.026). Having land as an asset was particularly associated with a decreased likelihood of children being underweight in Gu season, as shown by data from 2019 (p=.001) and 2020 (p=0.003) (Cf. Annex A: Combined Logistic Regression).

HYPOTHESIS K: LIMITED ACCESS TO MARKETS

Strength of the association with undernutrition in the *scientific literature*[15]	+
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	+
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	+
Overall interpretation	+

SECONDARY DATA REVIEW

- Regional economy is primarily dependent on livestock rearing and farming, but also has strong inter-regional and international cross-border trade with Kenya and Ethiopia
- Food prices highly susceptible to fluctuations, making some staples (such as rice) inaccessible to IDP families[2]
- Majority of IDPs source food from markets[2] while availability of vegetables is low[22]

QUALITATIVE INQUIRY FINDINGS

Market accessibility

On the Somalia-Ethiopia border and not far from the Somalia-Kenya border, Dollow was an important market town, acting as a transit route for goods and produce from and to Ethiopia. Access to market was fairly easy for all the IDPs, though a little further for those in Qansahley (4-4.5 km away) and in each settlement, small market centres were established with the support of NGOs. With larger population and the large Kabasa and main Dollow town market in its proximity, households in Kabasa had comparatively better access to markets. While it was a walking distance of less than 10 minutes for them, those from Qansahley had to incur transport cost of up to 15 ETB to travel to the main town market. In most cases, households preferred to travel to the main Dollow town market or Kabasa, which was said to have a variety of goods, although based on price data collected, there was no significant difference in the price in the main town market and the smaller markets within the settlements.

Market supply & price trends

From discussions with FGDs participants and traders during market visits, they indicated that the prices of commodities had increased recently due to the supply chain disruptions as a result on corona outbreak and devaluation of the Ethiopian Birr (ETB), the most commonly used currency locally. Table 16 provides comparison of the prices of commonly bought commodities before and after corona outbreak and ETB devaluation.

Commodity	Prices (ETB) before Covid-19 and devaluation	Prices (ETB) before Covid-19 and devaluation
Sugar	ETB 30 per Kg	ETB 40 per Kg
Rice	ETB 30 per Kg	ETB 40 per Kg
Wheat flour	ETB 30 per Kg	ETB 40 per Kg
Vegetable cooking oil	ETB 50 per litre	ETB 70 per Kg
Spaghetti (pasta)	ETB 30 per Kg	ETB 40 per Kg
Tomatoes	ETB 120 per Kg	ETB 160 per Kg
Potatoes	ETB 60 per Kg	ETB 100 per Kg
Onions	ETB 40 per Kg	ETB 80 per Kg
Milk powder	ETB 120 per Kg	ETB 160 per Kg
Meat	ETB 200 per Kg	ETB 320 per Kg

Table 17: Prices of essential commodities before and after corona and ETB devaluation

Seasonal & historical variations

It was observed that the markets had adequate diversity of products, including rice, wheat flour and pasta, as well as imported foods such as canned beans and tuna fish. Also, fruits, vegetables or other agricultural products were available in the market. However, most households had hardly enough income to meet their day's needs, only purchasing 2 – 3 types of staple foods. Market access does not seem to change throughout the year, but product availability is affected. All the markets (those within IDP settlements, Dollow and Dollo Ado markets) were all accessible throughout the seasons, though there were slight seasonal variations, especially during the rains when some roads were impassable. During such periods, the prices of some commodities were said to increase. However, informants indicated that Dollow was able to balance chain disruptions from different regions, as supplies came from Mogadishu, Ethiopia through Dollo Ado and Mandera (Kenya) through Belet Hawa.

Milk is considered very important in nutrition of children and it was said to be available seasonally. In the observed markets, camel milk followed by cattle milk was supplied from the surrounding production areas and retailed at USD 1.5 per litre. In all the settlements, households, especially those in Block 5 Qansahley kept a few sheep and goats for milk and the availability of milk increased during the rainy season as most of the animals gave birth to offspring while pastures and water were more available. Fruits and vegetables were available throughout the season, supplied by farming areas along the Daua and Juba as well as from Ethiopia.

QUANTITATIVE ANALYSES FINDINGS

No available data.

HYPOTHESIS L: LOW COPING STRATEGIES / RESILIENCE

Strength of the association with undernutrition in the *scientific literature*[15]	+++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	+++
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	+++
Qualitative team rating	++
Strength of historical and/or seasonal variations on undernutrition trends	++
Overall interpretation	+++

SECONDARY DATA REVIEW

- Households relocate most frequently in within Jubaland; on average about every 6 years; main reason for relocation being drought[11]
- IDPs have poor asset bases, leaving them with few or no items to dispose of to purchase food in times of scarcity[2]
- IDPs are highly vulnerable to food price shocks[2]

QUALITATIVE INQUIRY FINDINGS

Coping strategies

The IDP populations are vulnerable to shocks, such as droughts and floods, which routinely affect nutritional and health status of children. They are heavily dependent on seasonal income sources and there are significant numbers of female-headed households that depend on irregular and unprotected casual labour opportunities. This places considerable strain on women, resulting in some roles being transferred to older siblings, notably girls, who then help out with household chores, missing out on education and childhood growth.

Asked about the coping strategy in the time of crisis, households noted that their capacity has continued to deteriorate over time. In trying times, they, *"rely on social networks and family who stick together"*. The common food coping strategies of skipping of meals, multiple households members engaging in casual labour and other activities, dependence on gifts and humanitarian aid, and borrowing and credit from relatives, friends and businessmen were becoming more routine.

Social and financial support mechanisms

The FGDs participants highlighted the importance of social support and networks in accessing assistance, which were much more available in their villages of origin compared to the IDP settlements. As a result, it was common for new IDPs from Bay and Bakool region to settle in Kabasa to take advantage of these relations, while returnees from Ethiopia and pastoral dropouts from within Gedo mostly settled in Qansahley. Such relations enabled household's access support such as credit and contributions in case of emergency. Further, it was reported that poor households sometimes received food and cash in terms of gifts (*Sadaqa* and *Zakat*)

from wealthier groups or clan members. These forms of support were more available during religious periods such as Ramadhan, Eid and in the months of *Zakat* payments.

Savings and saving culture were said to be very low, though women participated in informal group saving (*Ayuta)* and there were reports of women selling off humanitarian assistance (e.g. Plumpy Nut for malnourished children) to meet the weekly contribution to the group. Several households particularly older IDPs in Kabasa had benefitted from business cash grants and other support to start income generating activities. Also, DRC has supported through a cost-share program a construction of houses for IDPs in Qansahley. The importance of mother-to-mother support groups initiated by NGOs in influencing mother in seeking health services, particularly antenatal and postnatal services, as well as referral for malnourished children was highlighted by interviewed NGO informants.

Another key issue highlighted during the study was the inequalities that existed between main clans and minorities, particularly as seen in the IDPs from Bay and Bakool (*Rahweyn)* and returnees (*Marehan)* and minorities (*Shabelle and Gare mare)* and even between new and old IDPs in access to humanitarian assistance. *"The less known you were, the more likely you would miss to be targeted in any of the assistance provided by the NGOs"* was a common statement in the meetings. The access to economic resources and to links and kinship that provide access to assistance largely determined the difference between these groups.

QUANTITATIVE ANALYSES FINDINGS

Children from households that had been displaced by drought were less likely to be *wasted* on the basis of weight for height z-score (p=0.05) and MUAC and/or weight for height z-score (p=0.045), as shown by logistic regression of data from Gu seasons in 2015 and 2016, however data from Gu seasons in 2017 and 2018 showed that households displaced by drought were more likely to have a child who was *wasted* on the basis of MUAC (p=0.044 and p=0.025, respectively). Furthermore, children from households that had been displaced by drought were more likely to be *stunted*, as shown by data from Gu seasons in 2018 (p=0.072) and 2019 (p=0.058). In Deyr season, there was no association between households displaced by drought and wasting, apart from children were less likely to be wasted on the basis of MUAC, as shown by data from 2016 (p=0.038) (Cf. Annex C: Logistic Regression).

Households that had been displaced by insecurity were more likely to have a child who was *wasted* on the basis of weight for height z-score in Gu season of 2015 (p=0.014) and on the basis of MUAC and/or weight for height z-score (p=0.007) in Gu season of 2016, but children from households that had been displaced by insecurity were less likely to be *stunted*, as shown by data from in Deyr seasons of 2017 (p=0.061) and 2019 (p=0.005). There is no statistical association between households displaced by insecurity and wasting in children in the Deyr season (Cf. Annex C: Logistic Regression).

Children from households that had been displaced by other reasons were more likely to be *wasted* on the basis of weight for height z-score (p=<0.05) and MUAC and/or weight for height z-score (p=0.05) in Deyr seasons of 2014 (p=<0.05) and 2016 (p=0.001) (Cf. Annex C: Logistic Regression).

Households that had been displaced by flood or fire were more likely to have a *stunted* child, as shown by logistic regression data from Deyr seasons of 2016 (p=0.004) and 2018 (p=<.001), and an *underweight* child, as demonstrated by data from Deyr seasons of 2016 (p=<.001) and 2017 (p=0.011). Households that had been displaced by eviction were slightly more likely to have a *stunted* child shown by data from Deyr season of 2014 (p=<.001) and 2016 (p=0.057). (Cf. Annex C: Logistic Regression). Logistic regression of combined data (2014-2020) showed that children from households that had been displaced by eviction were more likely to be *underweight* (p=0.09) Annex A: Combined Logistic Regression.

Purchasing food on credit or borrowing food was associated with a decreased likelihood of children being *stunted*, as shown by data from Gu seasons of 2018 (p=0.085) and 2019 (p=<.001), as was relying on food donations from relatives in the past seven days prior to data collection, as shown by data from Deyr seasons of 2014 (p=0.04) and 2016 (p=0.041) (Cf. Annex C: Logistic Regression). An increase in days borrowing food from another household was associated with a slight decrease in weight for age z-score (p=0.028) as well as weight for height z-score (p=0.007) (Annex B: Combined Linear Regression).

Households that were begging for food were more likely to have a *wasted child* on the basis of weight for height and/or MUAC, as shown by data from 2015 (p=0.019) and 2016 (p=<.001), and on the basis of MUAC, as shown by data from 2014 (p=<.001) and 2015 (p=<.001) (Cf. Annex C: Logistic Regression).

Furthermore, an increase in savings was associated with an increase in weight for height z-score (p=0.078), particularly in Gu seasons of 2015 and 2016 (p=<.001) but a decrease in height for age z-score (p=0.093), as demonstrated by linear regression of combined data (Cf. Annex B: Combined Linear Regression).

Households that shifted to eating less preferred foods were more likely to have a *wasted* child on the basis of MUAC and/or weight for height z-score (p=0.025). Households that limited portions or consumed spoiled or leftover foods were less likely to have an *underweight* child (p=0.075), particularly during Gu season of 2018 (p=0.047) and 2020 (p=0.017) (Cf. Annex C: Logistic Regression). Households that limited meal portions were also less likely to have a *stunted* child (p=0.085). An increase in days limiting meal portions or quantity consumed in a meal (p=0.001), and an increase in days taking fewer meals in a day (p=<.001) were also associated with a slight decrease in MUAC.

WATER, SANITATION AND HYGIENE

HYPOTHESIS M: INADEQUATE ACCESSIBILITY, AVAILABILITY AND QUALITY OF WATER AT HOUSEHOLD LEVEL

Strength of the association with undernutrition in the *scientific literature*[15]	+++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	++
Community rating during qualitative inquiry	++
Qualitative team rating	++
Strength of historical and/or seasonal variations on undernutrition trends	-
Overall interpretation	++

SECONDARY DATA REVIEW

- 93.5% of population in Dollow IDP settlements have access to water from safe sources[21]; women and girls are mostly responsible for collecting, handling and storing water, limited taps mean women travel early to avoid queues[8]
- The high urinary iodine concentration found in women ascribed to high iodine concentration found in drinking water. Iodine concentration in water varies widely (0-750 µg/L), which renders it nearly impossible to geographically target interventions to reach women with insufficient iodine intake[11]

QUALITATIVE INQUIRY FINDINGS

Barriers of access to drinking water

Geographical barriers

There were limited geographical barriers in accessing drinking water, as most of the water sources were within acceptable range to the IDP settlements and NGOs had made significant

investments in boreholes that supplied water through the water kiosks. However, water points were unevenly distributed within the settlements, leaving some households with long distances to travel. Also, because of the unavailability of water points and/or related costs, some households were forced to fetch water directly from the river, which was about 1 – 1.5 km from the settlements.

Financial barriers

On average, households pay 30 ETB per month for the piped water from kiosks, while such water is seen as unreliable. The alternative water sources are water supplied by private suppliers using water carts at 50 ETB (1 USD per 200 litres). In few instances, water trucking (in dry season) is supported by local administration and NGOs, which provide it for free. Being unable to meet water costs, it was common for households to congregate at free water kiosks (such as in Section 20 in Qansahley) or go to the river exposing the children to risks from crocodiles when fetching water.

Access to water has vastly improved overtime with water availed through constructed water kiosks. However, as the population increased with influx of new populations, the pressure on water sources increased. When new IDPs arrive at the settlements they become a burden on existing IDPs in terms of water access and usage. By hosting new IDPs, the existing IDPs community is burdened with reduced access to water, as the household size temporarily increases, as well as a higher financial burden to purchase water resources.

Temporal barriers

As not all water kiosks were working and were inadequate in number across the settlements, households congregated at few existing ones. The queue is often very long and it is difficult to get water in adequate quantity. Time taken to collect water ranges between 15 – 90 minutes for households collecting water from water kiosks, while collecting directly from the river took about 30 minutes one way. Time spent collecting water is time taken away from productive income generating activities for the households, feeding the circle of the 'urban poor' as water access is dictated by income.

Socio-cultural barriers

Water is predominantly collected by women and older children (both boys and girls). The distances and collection of water placed a physical strain on girls carrying 20 litres on their heads. As a result, it was common for them to roll jerricans on the ground, increasing the risk of contamination.

Water quality

Sources of drinking water

From the observation, KIIs and FGDs it was established that the IDP populations were served by different water sources, including water kiosks supplied from boreholes along the River Daua and Juba, water trucking, water purchases from donkey carts, and directly from the river – this water was muddy and households rarely treated the water. A transect walk in the settlements revealed several water kiosks not functional, forcing households to congregate at working water points, some of which were provided free.

Household transport and storage of water

Water is predominantly collected by women and older children (both boys and girls), which was time consuming and onerous task for them. As water was collected on the back, the distances and weight of the 20 litres placed a physical strain on the girlchild, as a result, it was common for them to roll the jerricans on the ground increasing the risk of contamination. In

the house, there were rarely separate water storage containers, and water was kept in the same collection container.

Household water treatment

Although, there was awareness on the importance of water treatment, especially when sourced from open water sources e.g. the river, they rarely treated the water. Asked why they did not boil the water, households indicated that the cost of firewood/charcoal was too high, so they could only save it for cooking.

Water consumption

Quantity per person per day

Water usage was reported to be lower than the SPHERE standard of 15 litres per person per day[23] and the camp management reported while the initial plan was that each household gets 5-6 jerry cans (each 20 l), most households were getting 2-3 jerry cans per day.

QUANTITATIVE ANALYSES FINDINGS

No available data.

HYPOTHESIS N: INADEQUATE HOUSEHOLD SANITATION PRACTICES

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+
Strength of the association with undernutrition based on statistical analysis[17]	+
Technical experts' rating during Initial Technical Workshop	+++
Community rating during qualitative inquiry	++
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	-
Overall interpretation	++

SECONDARY DATA REVIEW

- 95.9% of population in Dollow IDP settlements with access to latrines[21], although there are concerns about safety and the data is non-gender disaggregated[8]

QUALITATIVE INQUIRY FINDINGS

Open defecation and access to sanitation facilities

Access to sanitation facilities was relatively good in Kabasa with on average 4 households sharing a latrine while nearly each household in Qansahley has access to a latrine. Communal facilities, such as markets, mosques and IDPs Information Centre were also adequately served by sanitation facilities. However, several challenges existed including the collapse of latrines following rains (in Section 20 Qansahley) and filling up of latrines (in Kabasa). Some latrines were filling up and some were already filled up as seen during the observation – For example, in Kabasa Section F, of the initial 334 latrines, 189 of them were already filled and abandoned. A local NGO, Somalia Humanitarian Relief Action (SHRA), had supported desludging of latrines, but the exercise has stopped. Households abandoned the latrines, using them as garbage dumps or removed the iron sheets to construct a new one. Such sites posed a threat to children who were seen to play around these pits. In Qansahley, Section 20, the majority of latrines were poorly designed and sited along the flood path and as a result, most of them collapsed or filled with water and debris following the rains.

Open defecation was observed particularly in Kabasa Section BB, where access to latrines was much lower, with 6-8 households sharing a latrine. Also, with lack of system for emptying latrines that fill up, households were restricting its use. The FGD participants identified open

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[23] Sphere Handbook: Humanitarian Charter and Minimum Standards in Disaster Response, 2011.

defecation as a 'risky practice'. The capacity of households to construct a latrine is restricted by an access to land, especially in the older blocks in Kabasa and Qansahley as well as the cost of the construction of latrines. Other contributing factors include open defecation among the traditional nomadic populations and poverty.

Management of baby/young infant stools

It was observed that children below 7 years of age were not using the latrines, as most of them were locked, and thus engaged in open defecation. Mothers reported that they properly disposed the children stools in the latrines, but as young boys mostly played in the open spaces, it was more common for them to do open defecation.

Kitchen hygiene and food storage

Because of space limitations, some households cooked their meals outside, while older IDPs had constructed small make-shift cooking spaces. They also noted that as most of the food was consumed, the need to store food rarely arose. As for who did the cooking, mother and in their absence, girls cooked for the family – the level of hygiene by young girls compared to their mother was considered less, but mother said they continuously trained their daughter on food preparation (ensuring that food was adequately cooked) and on hygiene. As with other activities, the inadequacy of water in the family was highlighted as a key constraint to ensure kitchen hygiene and in food preparation.

Child play area

There were limited child playing areas within the settlements and it was common to find school-going children idling and playing around. Furthermore, there was inadequate coverage of child friendly spaces in the settlements, limited to one primary school playground in Qansahley and two-child-friendly space in Kabasa.

QUANTITATIVE ANALYSES FINDINGS

Logistic regression of combined data showed that households where all members used the same toilet were more likely to have a *wasted* child on the basis of MUAC (p=0.034) with a weaker association on the basis of weight for height z-score (p=0.052) and on the basis of MUAC and/or weight for height z-score (p=0.055). (Cf. Annex A: Combined Logistic Regression). However, logistic regression of data from Gu season of 2017 season showed that such households were more likely to have a *stunted* child (p=0.089) although was reversed in 2019 (p=0.068). Furthermore, data from 2018 showed that households were less likely to have a *wasted* child on the basis of MUAC and weight for height and un underweight child on the basis of weight for age z-scores (p=0.01, p=0.039 and p=0.035 respectively). (Cf. Annex C: Logistic Regression).

GENDER

HYPOTHESIS O: CAREGIVER'S HEAVY WORKLOAD

Strength of the association with undernutrition in the *scientific literature*[15]	++
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	++
Strength of the association with undernutrition based on statistical analysis[17]	N/A
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	++
Qualitative team rating	+++
Strength of historical and/or seasonal variations on undernutrition trends	++
Overall interpretation	++

SECONDARY DATA REVIEW

- Gender-roles shifted post-crisis; increase in women in petty ride[8]
- Interviews with adolescent girls and adolescent boys revealed that domestic household responsibilities usually fall to girls[19]
- Women at risk of gender-based violence and increased workloads due to long distances travelled in search of water, food and fuel and often need to take up the responsibilities of men who have migrated while women's small businesses stagnate when men migrate[24]

QUALITATIVE INQUIRY FINDINGS

Daily routine

The daily routine for women starts as early as 4:30am and finishes at 9pm with their work day consisting of at least 17 hours. They are in charge of the family responsibilities, household activities and income generation. The day for most IDP women starts at 4:30am to first pray, clean the compound and begin breakfast preparation. Though, there was a noticeable difference between the woman in the two IDP settlements of Qansahley and Kabasa given cultural and regional differences (Cf. Sources of income). Women in Kabasa do anything to earn a wage, including washing cloths and helping with domestic chores of host community households, while women in Section 20 in Qansahley do not do manual labour as their husbands mostly work and some were relatively well before displacement. Nonetheless, women in Qansahley still did their fair share of household chores such as fetching water, firewood collection and looking after the small domestic animals donated by networks from Gedo region. Women in Kabasa set off early in search of manual labour opportunities in Dollow Somalia or Dollo Ado washing clothes, helping in domestic chores such as cooking, hawking in the markets and providing market labour.

The daily routine for men and women were reported to be similar and consisted of 17 hours. While the work done by men was considered to be more labour intensive, they were said to be compensated by the rest they get when they are back home compared to the women who start their domestic duties when they return. After coming home from work at around 5pm most mothers said they then start working at home, cleaning, washing the children and starting to prepare super. The day will then continue until around 9pm when they are done for the day and prepare to sleep.

The daily activities of men and women across the different IDP settlements are summarized in Table 17.

Time	Men	Women	Men	Women
	Qansahley		Kabasa	
4:30am	Wakes and prepares for prayers. Goes to the mosque. Stays at the mosque reading Quran	Wakes up. Prepares breakfast, puts fire on.	Wakes up. Prepares for prayers and goes to the mosque.	Wakes up. Prepares breakfast, puts fire on and sweeps the compound.
5:20 am	Prayers.	Prayers.	Prayers.	Prayers.
6:00am	Goes back home after prayers.	Domestic chores: Sweeps the compound, fetches water, washes the baby, applies animal oil and dresses the baby.	Prepare for manual labour, find tools and drink black tea. Leaves home.	Fetches water. Prepares tea for husband. Gives children left over from previous night super.
7:00am	Takes breakfast at home.	Feeds children porridge	Arrives at work and gets ready to start.	Searches for labour work. Moves from one location to another.
8:00am	Reports to workplace; shop, hotel, market	Sees off the husband and releases the little herd of shoats with her elder	Starts the labour work.	Starts manual work: washes clothes, carries items from one shop to another. Baby

[24] SIDRA 2019.

	stalls, construction sites.	daughter, while rest of children go to School.		left under supervision of eldest child.
9:00am	Present at place of work.	Goes to the market.	Present at place of work.	Present at place of work.
10:00am	Present at place of work.	Comes back home with food and other supplies bought. Begins food preparation. Feeds children	Present at place of work.	Present at place of work.
11:00am	Present at place of work.	Lunch preparation.	Present at place of work.	Present at place of work.
12:00pm	Closure of work. Prayers at the mosque.	Prayers at home.	Prayers at place of work.	Prayers at place of work.
1:00pm	Lunch at home. Rest.	Lunch at home. Rest.	Lunch at the place of work. Work continues.	Lunch at the place of work. Work continues.
2:00pm	Report back to workplace.	Fetches water and firewood.	Present at place of work.	Present at place of work.
3:00pm	Present at place of work	Resting at home.	Present at place of work.	Present at place of work.
3:30pm	Prayers at the mosque.	Prayers and preparation of tea.	Prayers at the place of work.	Prayers at the place of work.
4:00pm	Closure of work activities.	Serves children tea.	Present at place of work.	Present at place of work.
5:00pm	Meets friends at the market place and waits for prayers.	Preparation of super. Bathing of children. Wait for prayers	Finished work, walking back home. Preparing for prayers.	Finished work, walking back home, fetching water/firewood
6:00pm	Prayers in the mosque.	Prayers at home.	Prayers in the mosque.	Prayers at home.
7:00pm	Supper at home.	Serves the family supper. Prayers at home.	At home with the family. Prayers in the mosque.	Supper preparation. Prayers at home.
8:00pm	Eats supper at home	Serves supper to family	Waits at home for supper.	Supper for all family members including children.
9:00pm	Gets ready to sleep.	Washes the used utensils and bathing children.	Gets ready to sleep.	Safely stores leftover supper for next day's breakfast.
10:00pm	Sleeping.	Sleeping.	Sleeping.	Sleeping

Table 18: Men and women activity profile, Kabasa and Qansahley, Dollow Somalia

Aside from working and doing domestic chores women's daily routine was said to increase when attending to a sick child. Likewise, it was not easy attending antenatal clinics. While traditionally gender roles were more defined as men go out to work and provide, while women mainly stayed home to look after the family, there is a shift in the gender roles as women are more frequent working (Kabasa (manual work) and Qansahley (small businesses)). Women reported significant changes in gender activities in comparison to their villages of origin where they would be predominant engaged in household chores and agricultural production while in the settlements they have forced to take up casual labour. As a consequence, women in the FGDs noted that with such daily activities, it was close to impossible to guarantee adequate feeding and care of children, let alone exclusive breastfeeding.

Community perceptions of caregiver's workload

Caregivers' workload was cited as a major impediment to quality interaction between the child and caregiver. It was also one of the factors associated with higher prevalence of malnutrition in Kabasa compared to Qansahley. This lifestyle of high maternal workload takes its toll on the women with then reporting extreme tiredness and fatigue with no time "for the kids or herself". The implications of the changes of gender roles and women's long hours and tiresome routines was that they were unable to attend to the needs of the children. One mother said ''*after staying out for long periods by the time I come home it's too late and I feel powerless to provide the care and love the child needs''*. Women were unable to attend antenatal and prenatal clinics and the mother was forced to delegate some of the household chores to eldest child and girls. This was acknowledged for negatively impacting the relationship between mother and child and is also recognised by mothers to impact care practices.

QUANTITATIVE ANALYSES FINDINGS

No available data.

HYPOTHESIS P: LOW FEMALE AUTONOMY/ LOW DECISION-MAKING POWER

Strength of the association with undernutrition in the *scientific literature*[15]	+
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+++
Strength of the association with undernutrition based on statistical analysis[17]	+
Technical experts' rating during Initial Technical Workshop	+
Community rating during qualitative inquiry	+
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	+

SECONDARY DATA REVIEW

- Women do not usually hold key decision-making roles in the household, community or local government; their specific problems and needs are often neglected. Women report less decision-making power, flexibility in eating habits, compared to boys and men[19]
- Husbands are decision-makers while older women exert powerful influence[2], feeling responsibility for the health of their daughters, while significantly influencing their behaviour[19]

QUALITATIVE INQUIRY FINDINGS

Household nutrition

Being the primary caregivers, women acknowledged that they play a major role in the day to day decisions about a child's food intake.

Food purchases

In all the settlements "*most of the decisions in the house, like what to cook or what to buy*", is made by the women. Food purchases are done by women and a times children are sent to the market with the instructions of what to buy. In exploring the differences in spending habits of men and women, it was highlighted that "*women were better managers of small resources available*" as any income she makes is only spent on the family. They said that whatever small the household made was used to purchase food, "*we live from hand-to-mouth and cannot afford any luxuries*".

Management of household income

The common opinion, was that women and men share decision making responsibility, although the degree to which this is implemented varied. Women made most decisions regarding which food to buy and cook while decisions on schooling, marriage, household expenses and family planning are made jointly in consultation between husband and wife. Men are said to be spending money extravagantly like spending on non-food stuff such as khat (a narcotic plant chewed mostly by men in the Horn of Africa/Middle East). Also, since women are income earners and are usually targetted by humanitarian agencies, most men have come to the realisation that they are indeed better to manage the income. There was a slight variation between the two settlements Qansahley residents were more traditional and said men will manage the household income. This was because majority of their men worked and the culture of poligamy was less practiced in Qansahley while in Kabasa it was widespread.

Management of own income

Management of own income was said to solely lie with the woman, and in most cases used for the income for family needs. One participant clearly stated ''*what she works is hers and hers alone and has 100% decision, she will spend it as she pleases and either share it with husband or*

choose not to at her own discretion". The implication of this was that most of the incomes women made all went to household use.

Access to health care

The caregiver's decision-making on health care is usually a joint decision, even though as the mother is closer to the children, she is the one who identifies the sick child first. Most men said that they delegated it to women as it is women who attend the majority of hospital appointments/visits. As observed at all the facilities we visited it was women that were the overwhelming majority. During our visit to the OTP centre all the attendees were women and children. The implication of women making the decisions about access to healthcare was that it allowed family members to seek services earlier as conditions were identified early, but with a heavy workload, the women were forced to delay health-seeking to periods when they were free, which was mostly late in the afternoon.

Use of modern contraceptive methods

The decision to use modern contraceptives was with the woman with the consent of the husband, although the uptake was generally low. The implication of the joint decision was that if the men were better educated, they would support their wives to seek these methods, but as traditional men they either avoided such discussion or prevented the mothers from use of the contraception.

QUANTITATIVE ANALYSES FINDINGS

Logistic regression of combined data (2014-2020) showed that children living in households with female as a main decision-maker were less likely to be *stunted* than children living in households where main decision-maker was not female (p=0.057) (Cf. Annex A: Combined Logistic Regression).

Logistic regression of data from all years showed children from households that had a female head of household were less likely to be stunted, as shown by data from Gu seasons of 2019 (p=0.006) and 2020 (p=0.016) (Cf. Annex C: Logistic Regression).

HYPOTHESIS Q: LOW SOCIAL SUPPORT FOR WOMEN

Strength of the association with undernutrition in the *scientific literature*[15]	+
Strength of the association with undernutrition based on *secondary data review* relevant for the study zone[16]	+++
Strength of the association with undernutrition based on statistical analysis[17]	+
Technical experts' rating during Initial Technical Workshop	+++
Community rating during qualitative inquiry	++
Qualitative team rating	+
Strength of historical and/or seasonal variations on undernutrition trends	N/A
Overall interpretation	++

SECONDARY DATA REVIEW

- Nationally, 25.5% of heads of households ever attended school or preschool[11]
- Sexual violence is common; displaced women and girls are disproportionately vulnerable and made up 73% of reported cases in 2016[25]
- Prevalence of female genital mutilation (FGM) exceeds 95% in Somalia[18], resulting in increased risk of delivery complications, prolonged labour, obstetric lacerations, instrumental delivery and obstetric haemorrhage[26]

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[25] Joint Agency Briefing Note, 2018.
[26] Tradition in Transition: Factors Perpetuating and Hindering the Continuance of Female Genital Mutilation/Cutting (FGM/C) Summarized in a Systematic Review, RIgmor C. Berg, 2013

- Men do not tend to accompany their wives to health facilities; some men believed that health facilities are 'women-only zones'[19]
- In many areas of Somalia, customary law (Xeer) and religious law (Sharia) operate in place of or alongside the secular state legal system and women have historically suffered severe discrimination within this customary and legal processes.[27]

QUALITATIVE INQUIRY FINDINGS

Women support groups

Support systems for women start with family, supporting in taking care of children when the mother was away, supporting family in times of crisis and providing other social support. With the major burden of women assuming responsibilities for searching for food and income earning opportunities, almost all women who participated in the FGDs reported engaging in some form of income or productive activity in addition to the commonly performed household activities. "*The lucky mother with older children both boys and girls will get some support from her children. At least they will be able to help with fetching water and looking after sibling and reducing our workload.*"

Sometimes religiours leaders, camp administrators can mobilise community members to help support the vulnerable members of society. Also, older IDPs were said to develop their own networks and relationships over time. Several mother-support groups and informal women saving groups Ayuta also existed in the settlements. These groups were valuable in supporting women in time of crisis, advising them and passing health information in the settlements. According to one of the camp elders, *when a family first comes, we all have to chip in and help them settle. Once settled they are orientated by the camp leadership, friends, family members or neighbours who help them adopt quickly to camp life by finding economic opportunity and integrating into social structures.*

Access to education / information

In the settlements, the educational levels of both men and women were very low, with most of them having agro-pastoral and pastoral background and accessing Quranic schools only. They said it impacted on women's capacity to attend to basic tasks or manage their affairs. They said *"the lack of education may in part be responsible for the struggle in which we find themselves in, including ability to seek services and engage in livelihoods activities. We are stuck with casual labour opportunities"*. Access to mobile phones was generally said to be high, as Dollow had coverage of both Ethiotel and by all the Somali mobile companies. Information was also available at the IDPs information centre, camp leaders/chairmen and NGOs through the community hygiene promoters/health workers.

As for the children access to education, while Qansahley IDP settlement was served by the Qansahley primary school, Kabasa was served by Kabasa and Durrow primary schools, all which were free. The school attendance in both Kabasa and Qansahley was said to be improving but still low according to community leaders. While the school provided some feeding program and children attended the school because of the free lunch, the facilities in the schools were poor and teachers very few. As a result, the quality of education and dropout rates were said to be high. While education was agreed as away out of poverty among participants, some said it was a waste of time since they cannot find employment as most of the paid employment was reserved for the host community. '' all the leaders of the governmrent and organisation only employ their own'' was the response of a mother in Kabasa. In Qansahley the attitudes was better among the returnees from Ethiopia who valued education better than pastoral dropouts. Returnees from Ethiopia lamented about the distance

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[27] UNICEF 2021- 2025

to school from block 20 is about an hour walk and children are bullied along the way by older children.

QUANTITATIVE ANALYSES FINDINGS

Logistic regression of combined data showed that a mother's education was associated with a decreased likelihood of having a *wasted* child on the basis of weight for height z-score (p=<.001), but an increased likelihood of having a wasted child on the basis of MUAC (p=<.001), an increased likelihood of having a *stunted* child based on height for age z-score (p=<.001) and an increased likelihood of having an *underweight* child based on weight for age z-score (p=<.001) (Cf. Annex A: Combined Logistic Regression).

V. CONCLUSION AND RECOMMENDATIONS

Causal mechanisms of undernutrition

The calculation of statistical associations between individual risk factors and nutritional status of children in surveyed households allowed to differentiate between causal mechanisms of wasting, stunting and underweight. While the risk factors, e.g. *low access to income*, studied during this nutrition causal analysis overlap, the quantitative indicators, e.g. *source of primary income: casual labour*, are not universally valid for all three forms of undernutrition and/or the evidence for each may be contradictory.

The causal pathways presented below are based on the pathway designed during the community consultations (Cf. Figure 2) while the findings of the statistical analyses have been added to it to visually summarize the available evidence.

Acute malnutrition

The dominant pathway to wasting likely takes its roots in a limited access to income sources, which triggers inadequate coping strategies with an effect on a dietary intake of the household, yet mostly affecting women of reproductive age and children under 5 years of age. Children from households that received income from casual labour, sales of camel and cattle and gifts/*zakaat*[5] were more likely to be *wasted*. On the other hand, children from households that had a primary income from petty trade or self-employment or children from households with land were less likely to be *wasted*. Households that had been displaced by drought were more likely to have a *wasted* child on the basis of MUAC in Gu seasons of 2017 and 2018 but less likely to have a *wasted* child on the basis of weight for height z-score and MUAC and/or weight for height z-score in Gu seasons of 2015 and 2016. Households that had been displaced by insecurity were more likely to have a *wasted* child in Gu seasons of 2015 and 2016 while children from households that had been displaced for other reasons were more likely to be *wasted* in Deyr seasons of 2014 and 2016.

Households that shifted to eating less preferred foods or were begging for food were more likely to have a *wasted* child, especially during Deyr seasons of 2014 to 2016 for the latter. An increase in days limiting meal portions or quantity consumed in a meal, and an increase in days taking fewer meals in a day were associated with a slight decrease in MUAC.

In terms of dietary diversity, children from households that consumed eggs were more likely to be *wasted*. An increase in days consuming flesh meat was associated with a slight decrease in MUAC in Deyr seasons of 2014 and 2017, as was the consumption of oils and fats in a combined dataset (2014-2020). A decrease in MUAC was also associated with an increase in household consumption of Vitamin A rich vegetables in Deyr seasons of 2016 and 2019. However, data from Gu seasons of 2015 and 2016 shows Vitamin A rich vegetables as a protective factor for wasting on the basis of weight for height z-score. Children from households that consumed cereals were less likely to be *wasted* on the basis of MUAC. An increase in household's consumption of organ meat had a positive influence on child's wasting in Gu seasons of 2015 and 2016. A significant influence of household's consumption of any meat was observed in Deyr season of 2016. Increasing household consumption of Vitamin A rich fruits was associated with an increase in child's weight for height z-score and MUAC in Deyr seasons of 2014 and Gu seasons of 2015 and 2016 as well as child's MUAC in the latter two. An increase in household consumption of vegetables was identified as a protective factor for wasting in Gu seasons of 2017 and 2019.
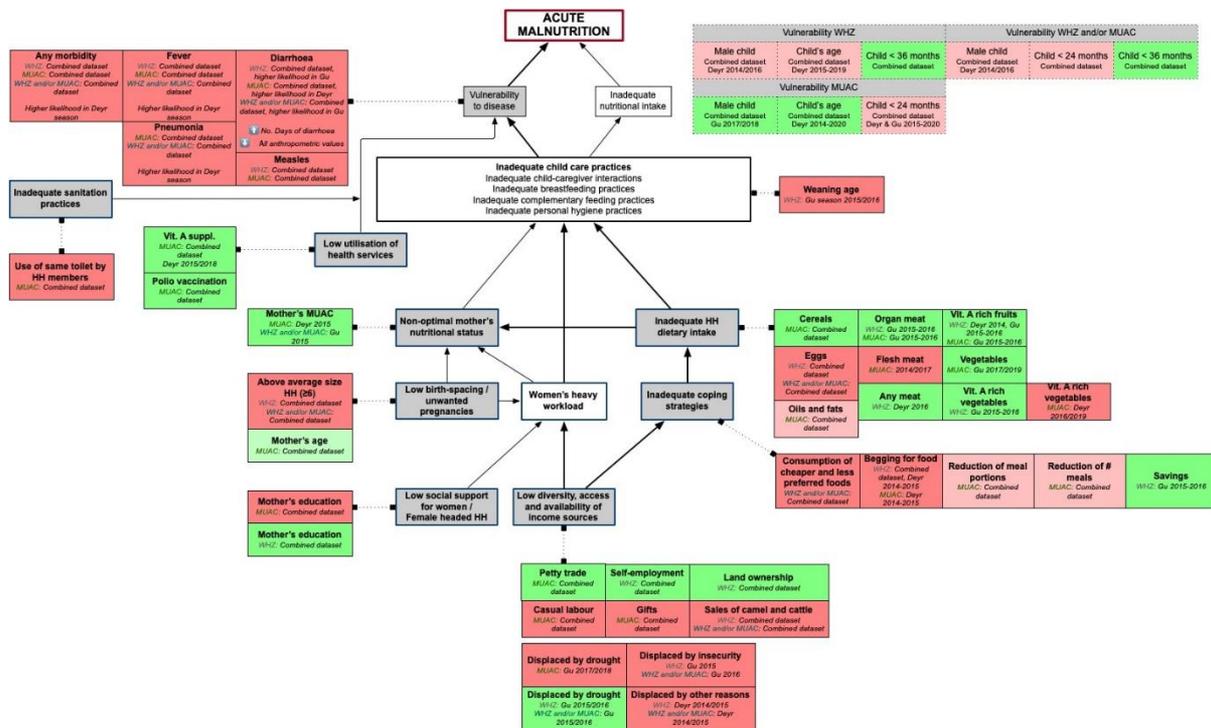
Figure 4: Causal pathway for acute malnutrition, Dollow IDP Settlements

Limited access to income sources coupled with low social support for women increases women's workload as women absorb income-generating responsibilities, which distance them from child care. Women's workload is further exacerbated by repetitive pregnancies with consequences on their nutritional status, which lowers their capacity and/or perception of that capacity to breastfeed. Inadequate child care practices then translate into a child's higher vulnerability to diseases and inadequate nutritional intake, and consequently acute malnutrition.

Considering the priority focus of the FSNAU datasets on food security and nutrition, the supporting evidence for this section of the pathway is considerably scarcer. Mother's education was associated with a decreased likelihood of having a *wasted* child on the basis of weight for height z-score but an increased likelihood of wasting by MUAC. An increase in mother's age was associated with a slight increase in child's MUAC while children from above average-sized households (≥6 members) were more likely to be *wasted*. Mother's MUAC came out as a protective factor in Deyr and Gu seasons of 2015. The weaning age of a child, i.e. the age, at which a child stopped breastfeeding, was associated with a decrease in child's MUAC in Gu seasons of 2015 and 2016. Children who received Vitamin A supplementation or a polio vaccination were less likely to be *wasted*. On the other hand, children who had diarrhoea in the past two weeks prior to data collection were more likely to be *wasted* on the basis of MUAC during Deyr season but on the basis of weight for height z-score during Gu season. An increasing number of days of diarrhoea was associated with a decrease in child's weight for height z-score and MUAC. Children who had pneumonia, fever or measles in the past two weeks prior to data collection were more likely to be *wasted*, notably in Deyr season.

This pathway essentially resembles the pathway designed for SO-19 Livelihood zone covering IDP settlements in Kahda district during a Link NCA study in 2019. The key differences lie in available evidence, i.e. indicators, as the said study included its own primary quantitative data collection and therefore presented more evidence for gender and water, sanitation and hygiene sectors.

In terms of vulnerability, male children in Dollow were more likely to be *wasted* on the basis of weight for height z-score and on the basis of MUAC and/or weight for height z-score but less likely to be wasted on the basis of MUAC only. The vulnerability of male children towards wasting was most pronounced during Deyr season of 2014 and 2016. Children under 24 months were more likely to be wasted on the basis of MUAC or on the basis of MUAC and/or weight for height z-score while their likelihood of being wasted was equally observed in both Gu and Deyr seasons from 2015 to 2020. Linear regression demonstrated age as a risk factor for wasting on the basis of weight for height z-score. Effectively, children aged 36 months and under were less likely to be *wasted* on the basis of weight for height z-score and on the basis of MUAC and/or weight for height z-score.

Chronic malnutrition

The dominant pathway to stunting likely takes its roots in a limited access to income sources, which triggers inadequate coping strategies with an effect on a dietary intake of the household, yet mostly affecting women of reproductive age and children under 5 years of age. Children from households that had a primary income from petty trade as well as children living in households who owned land were less likely to be *stunted*. Children living in households who depended on gifts/*zakaat*[5] as their primary income were more likely to be *stunted*. Children from households that had been displaced by drought were more likely to be stunted in Gu seasons of 2018 and 2019. Households that had been displaced by flood or fire were more likely to have a *stunted* child in Deyr seasons of 2016 and 2018. Households that had been displaced by insecurity were slightly less likely to have a *stunted* child in Deyr seasons of 2017 and 2019.

Purchasing food on credit or borrowing food was associated with a decreased likelihood of children being *stunted* in Gu seasons of 2018 and 2019, as was relying on food donations from relatives in Deyr seasons of 2014 and 2016. Households that limited their meal portions in the last seven days prior to data collection were less likely to have a *stunted* child. An increase in days consuming flesh meat was associated with a decrease in child's height for age z-score in Gu seasons of 2014, 2015 and 2019 as was the consumption of organ meat in Deyr season of 2019. On the other hand, an increase in the consumption of any meat was associated with an increase in child's height for age z-score in Gu season of 2018, with a stronger association in 2019. Households that consumed cereals and fruit in the last seven days prior to data collection were less likely to have a *stunted* child. An increase in household's consumption of milk and milk products was associated with an increase in child's height for age z-score in Deyr seasons from 2014 to 2016. An increase in the consumption of Vitamin A rich vegetables was associated with an increase in child's height for age z-score in Deyr and Gu seasons of 2016 and 2019. The consumption of oils and fats came out as a protective factor against stunting in Deyr seasons of 2014 and 2015. Households that spent over 80% of earnings on food were less likely to have a *stunted* child.

Limited access to income sources coupled with low social support for women increases women's workload as women absorb income-generating responsibilities, which distance them from child care. Women's workload is further exacerbated by repetitive pregnancies with consequences on their nutritional status, which lowers their capacity and/or perception of that capacity to breastfeed. Inadequate child care practices then translate into a child's higher vulnerability to diseases and inadequate nutritional intake, and consequently acute malnutrition.

Considering the priority focus of the FSNAU datasets on food security and nutrition, the supporting evidence for this section of the pathway is considerably scarcer. Children living in households with a woman decision-maker were less likely to be *stunted* however mother's education increased the likelihood of a child being *stunted*. Unlike in case of acute malnutrition, no associations with Mother's MUAC, size of the household or weaning age were observed.

Children who received Vitamin A supplementation were less likely to be *stunted* only during Gu season of 2019. Children who had diarrhoea in the past two weeks prior to data collection were more likely to be *stunted*, notably in Gu season, while an increasing number of days of diarrhoea was associated with a decrease in child's height for age z-score. Children who had pneumonia in the past two weeks prior to data collection were more likely to be *stunted*, notably in Deyr season. In comparison to acute malnutrition, no associations were observed between stunting and fever or measles.
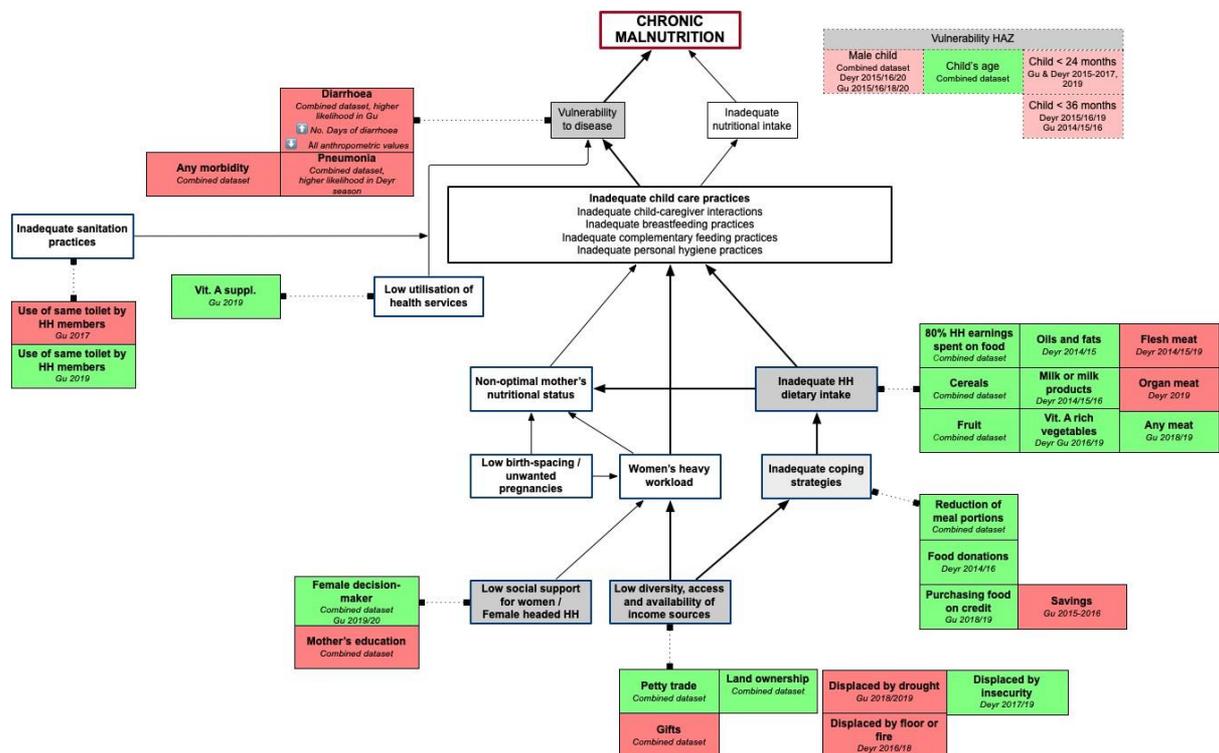
Figure 5: Causal pathway for chronic malnutrition, Dollow IDP Settlements

In terms of vulnerability, male children in Dollow were more likely to be *stunted*, notably during Gu seasons of 2015, 2016 and 2020 and Deyr seasons of 2015, 2016, 2018 and 2020. Children under 24 months were more likely to be *stunted* while the likelihood of being stunted was not preferably linked to a particular season. Children under 36 months were more likely to be stunted in Deyr seasons from 2015, 2016 and 2019 and Gu seasons of 2014 to 2016. Increasing age was associated with an increase in child's height for age z-score, suggesting that younger children are at the highest risk of growth faltering.

Underweight

The dominant pathway to underweight likely takes its roots in a limited access to income sources, which triggers inadequate coping strategies with an effect on a dietary intake of the household, yet mostly affecting women of reproductive age and children under 5 years of age. Children from households that relied on petty trade or other sources as their primary income were less likely to be *underweight*. Having land as an asset decreased likelihood of children being *underweight*, particularly in Gu seasons of 2019 and 2020. Children from households that depended on gifts/*zakaat*[5] as their primary source of income were more likely to be *underweight*. Households that had been displaced by eviction were more likely to have an *underweight* child while households that had been displaced by flood or fire were more likely to have an *underweight* child in Deyr seasons of 2016 and 2018.

An increase in household consumption of cereals and organ meat decreased child's odds of being *underweight*. The consumption of milk and milk products as well as any meat had a

significant positive influence on child's weight for age z-score in Deyr seasons of 2014 and 2016. Households that borrowed food were less likely to have an *underweight* child while households that reduced meal portions or consumed spoiled or leftover food were more likely to have an *underweight* child.
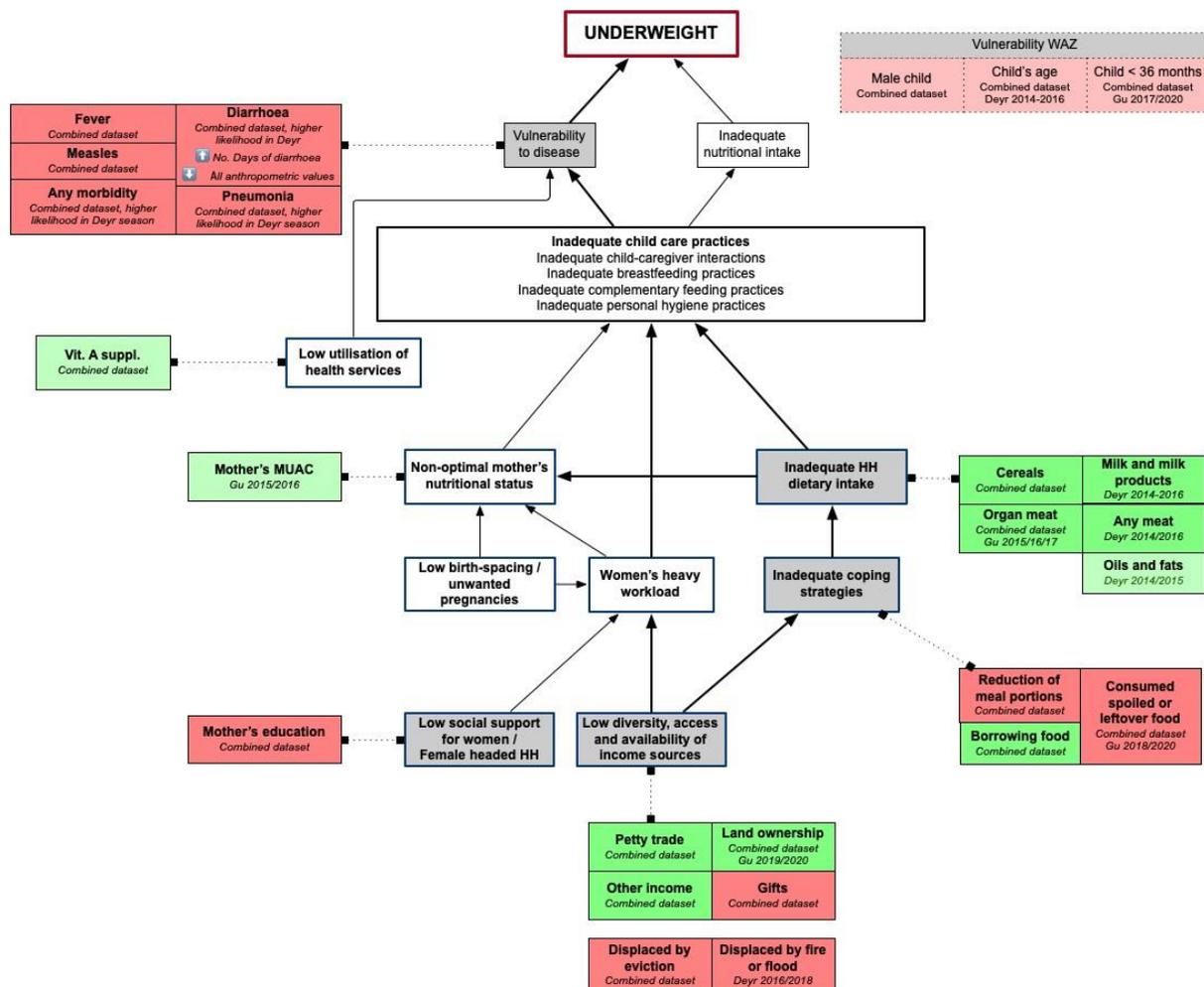
Figure 6: Causal pathway for underweight, Dollow IDP Settlements

Limited access to income sources coupled with low social support for women increases women's workload as women absorb income-generating responsibilities, which distance them from child care. Inadequate child care practices then translate into a child's higher vulnerability to diseases and inadequate nutritional intake, and consequently acute malnutrition.

Considering the priority focus of the FSNAU datasets on food security and nutrition, the supporting evidence for this section of the pathway is considerably scarcer. Mother's education increased the likelihood of a child being *underweight* while children of mothers in optimal nutritional health were slightly less likely to be *underweight* in Gu seasons of 2015 and 2016, similarly to children who received Vitamin A supplementation in the last 6 months prior to data collection in both Gu and Deyr seasons from 2014 to 2020. On the other hand, children who had diarrhoea, pneumonia, fever or measles in the past two weeks prior to data collection were more likely to be *underweight* while the likelihood was higher in Deyr season. An increasing number of days of diarrhoea was associated with a decrease in child's weight for age z-score.

In terms of vulnerability, male children and children under 36 months were more likely to be *underweight*.

Undernutrition

Based on the pathway designed during community consultations (Cf. Figure 2) the causal pathways for acute malnutrition, chronic malnutrition and underweight follow the same pattern but differ in composition of the available evidence with a potential impact on programmatic responses.

Common risk factors for *wasting* on the basis of at least one index (WHZ <u>or</u> MUAC <u>or</u> WHZ and/or MUAC), *stunting* and *underweight* include a male child, the occurrence of morbidities, including diarrhoea and pneumonia, and the household's dependence on gifts/*zakaat*[5] as their primary source of income. On the other hand, children were less likely to be *wasted*, *stunted* or *underweight* if they received Vitamin A supplementation, consumed cereals or any meat, their household owned land or declared petty trade as their primary source of income.
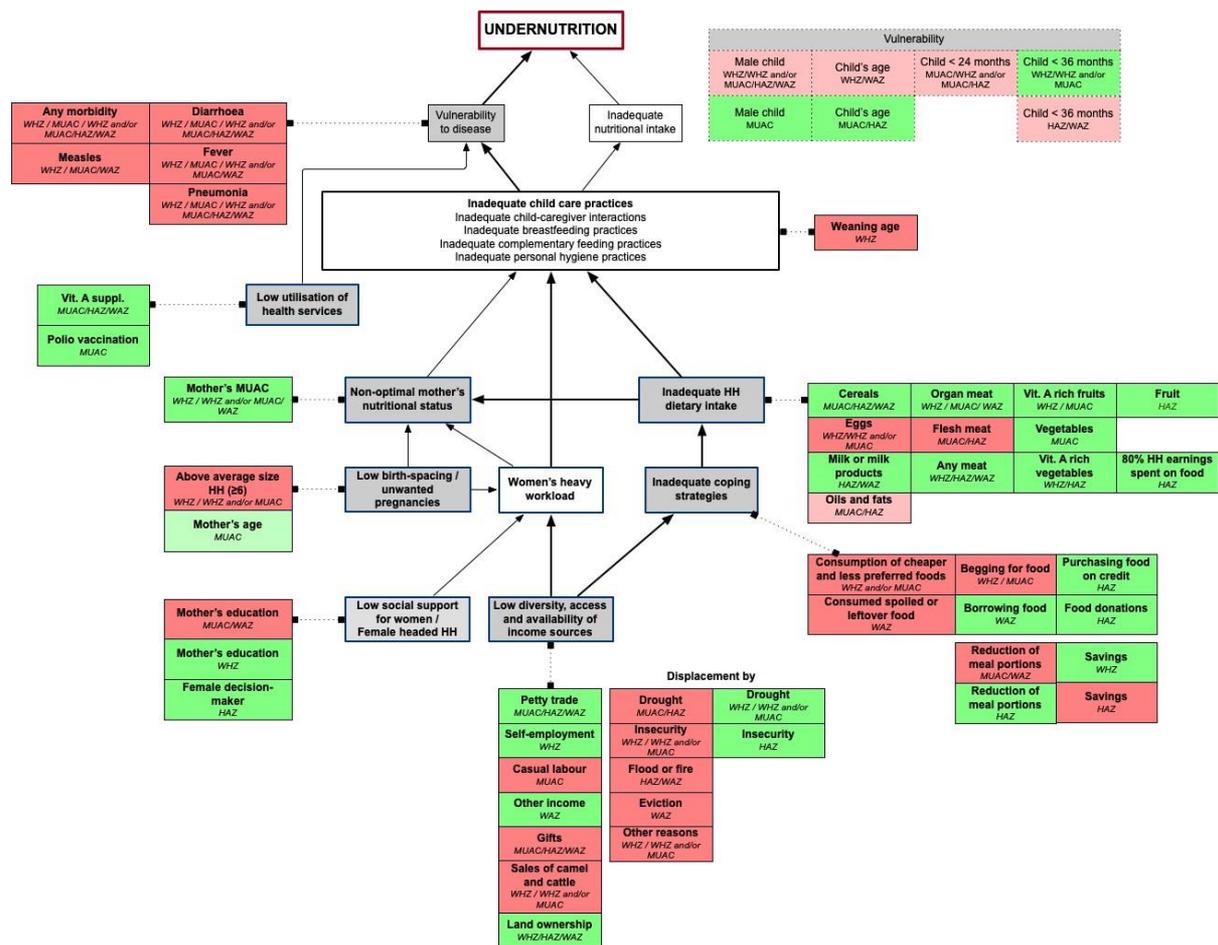
Figure 7: Causal pathway for undernutrition, Dollow IDP Settlements

Common risk factors for *wasting* on the basis of at least one index (WHZ <u>or</u> MUAC <u>or</u> WHZ and/or MUAC) and *stunting* include child's age, meaning children younger than 24 months had higher odds of being *wasted* or *stunted*. Children were also more likely to be *wasted* or *stunted* if they lived in households displaced by drought or households, which consumed flesh meat. On the other hand, the consumption of Vitamin A vegetables came out as a protective factor against wasting and stunting.

Common risk factors for *wasting* on the basis of at least one index (WHZ <u>or</u> MUAC <u>or</u> WHZ and/or MUAC) and *underweight* include child's age, the occurrence of fever or measles, mother's education, reduction of meal portions and consumption of organ meat.

Summary of categorisation of risk factors

The analyses undertaken during this Link NCA study allowed to identify 17 risk factors, believed to have an impact on the incidence of undernutrition in the study zone. Following a triangulation of data from diverse sources, 4 risk factors were identified as having a major impact, 8 risk factors were classified as having an important impact and 5 risk factors were judged to have a minor impact on the incidence of undernutrition in the zone of study. Among the major risk factors, two were identified in the sector of mental health and care practices, namely non-optimal breastfeeding practices and non-optimal complementary feeding practices, while the other two major risk factors, low access to income sources and low coping capacities, were identified in the sector of food security and livelihoods.

Risk factor		Overall interpretation/ Impact of risk factor
A	Limited access to health services	++
B	Low birth spacing/ early, repetitive or unwanted pregnancies	++
C	Low birth weight	+
D	Low nutritional status of women	++
E	Parental stress	+
F	Non-optimal breastfeeding practices	+++
G	Non-optimal complementary feeding practices	+++
H	Low quality of interactions between a child and a caregiver	+
I	Low access to food	++
J	Low diversity/ access/ availability of income sources	+++
K	Malfunctioning market or supply system	+
L	Low coping capacities	+++
M	Inadequate accessibility, availability and quality of water at household level	++
N	Poor sanitation practices	++
O	Heavy workload of women	++
P	Low female autonomy/ decision-making	+
Q	Low social support for women	++

Table 18: Summary of categorisation of risk factors, Dollow IDP Settlements

The overall categorisation of risk factors reflects the community rating, during which the said four risk factors were also categorised as major. The remaining major risk factor, per community perception, was limited access to health services, which was devaluated in the overall rating due to the lack of quantitative evidence.

Summary of ongoing interventions

Per community feedback, most interventions in IDP settlements in Dollow pertain to the health and nutrition and water, sanitation and hygiene sectors. They are primarily provided by UN agencies directly or via their local partners. While certain operational partners have been supporting the displaced population via food security and livelihoods projects, their scope is limited yet widely desired. Mother-to-mother support groups or village savings and loans associations (VSLA) are appreciated but their coverage and support mechanisms need to be strengthened to be able to deliver a desired effect. The population expressed a clear interest in more development-type programming, which would enhance in a sustainable manner their capacity to provide for their households instead of depending on emergency humanitarian assistance. In addition, they requested projects targeting underlying social issues, which, for example, prevent the appropriation of health messaging at community, household and individual level. A particular attention should be based to gender-sensitive programming, considering the practical implications of women-centred targeting on their workload and consequent capacity to follow recommendations on optimal child care practices.

Recommendations

During the qualitative inquiry, the following activities were requested by communities to be integrated for an incorporation into current/future interventions.

Sector	Proposed solutions
Health and Nutrition, including care practices	- Strengthen the quality of services in IOM-supported facilities to encourage their utilisation; - Strengthening the coverage and support mechanisms of mother-to-mother support groups and village savings and loans associations (VSLA), which can support awareness raising and counselling initiatives at community, household and individual levels, especially with regards to non-optimal child care practices, including non-optimal breastfeeding, complementary feeding and health seeking and environmental hygiene practices; - Create safety net initiatives for women with malnourished children, including the provision of food and/or cash transfers to cover immediate needs while also providing counselling and life skills coaching aiming to prevent future relapse;
Food Security and Livelihoods	- Upscaling the existing cash transfer program and targeting vulnerable households in blocks, which are not covered by the intervention; - Provision of skills training for youth, including technical skills, business and entrepreneurship training followed by business grants; - Support local job creation opportunities, such as the establishment of small businesses and trades.
Water, Sanitation and Hygiene	- Support community level initiatives to reduce environmental risks, such as draining of stagnant water and management of water points as well as digging/excavating garbage pits, maintenance of latrines, etc.
Gender	- Support women to access safe sources of income in the proximity of their homes and advocate for more community and household support in relation to household and child rearing duties.

Table 19: Community recommendations

During a synthesis phase of this Link NCA study, the community recommendations were integrated in the following key recommendations for operational partners in Dollow.

▪ Support ongoing awareness raising interventions at community level with household and individual level coaching initiatives aiming to support targeted vulnerable households/persons to adopt and maintain optimal child care behaviours. This can be done through existing networks of community health workers, mother-to-mother support groups or other community-accepted mechanisms, while ensuring that these actors can provide personalised mentoring adapted to concerned individuals' needs. These activities should primarily target women and children within 1000 days' window, notably male children, children from above-average sized households and children at heightened risk of common child morbidities, while ensuring that community-level awareness raising interventions address key identified barriers to behaviour change, including their gatekeepers;

▪ Provide personalised support to targeted vulnerable households/persons to build up and maintain their capacity to provide optimal care to children under 5 years of age, including the support to access income, cope in times of increased economic stress and other shocks experienced by the household. These activities should target households with unstable access to income, such as households depending on gifts, donations and begging as their primary source of income;

▪ Support community exchanges on social issues, such as the use of modern contraceptives, gender equality and gender-based violence, allowing community members to discuss in-depth and design intra-community solutions to these issues, without the pressure to accept "western" models of behaviour, which are incompatible with their value systems;

▪ Support women to access to safe sources of income, e.g. petty trade or self-employment, in the proximity of their homes in order to create an enabling environment for optimal child care practices in the form of a sustainable access to quality diet and quality mother-child interactions;

▪ Support the consumption of diversified diet, promoting sustainable, local food sources, including plant-based proteins.

Other recommendations include:

▪ Address long-term food insecurity of households in IDP settlements by facilitating access to land and a variety of income sources, including business and entrepreneurship training followed by business grants;

- Improve the quality of provided health services by strengthening skills and competencies of frontline workers and ensuring a continuous supply of medical materials and medicine. This should also include the provision of mental health care services;
- Strengthen investments in preventive measures against undernutrition, including antenatal consultations, vaccination, deworming and Vitamin A supplementation, among women and children at greater risk of undernutrition by encouraging community level screening and referral;
- Improve the access to water by increasing a number of water kiosks within the IDP settlements;
- Encourage community-led total sanitation initiatives, including community-led construction of latrines and desludging for filled latrines, to improve the environmental hygiene.

ANNEX A: COMBINED LOGISTIC REGRESSION

Table 20: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression (All FSNAU data combined 2014-2020)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		Stunting *Children 6-59 months*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Male child	8453	4303	50.9 [49.7-52.1]	1.3	0	1.3 [1.14]-[1.48]	0.005	0.77 [0.65]-[0.93]	0.017	1.17 [1.03]-[1.33]	0	1.38 [1.27]-[1.5(
Main provider female	6471	1695	26.2 [23.3-29.1]	7.3	0.855	1.02 [0.81]-[1.28]	0.718	1.05 [0.80]-[1.38]	0.843	1.02 [0.83]-[1.25]	0.105	0.88 [0.74]-[1.0:
Main decision maker female	5143	1641	31.9 [28.4-35.4]	7.3	0.472	1.07 [0.89]-[1.30]	0.544	0.9 [0.63]-[1.28]	0.424	1.08 [0.89]-[1.33]	0.057	0.81 [0.66]-[1.0:
Age group -<24 months	8453	2967	35.1 [34.2-36]	0.8	0.95	1 [0.87]-[1.13]	0	9.32 [7.24]-[11.99]	0	1.5 [1.32]-[1.70]	0	1.74 [1.53]-[1.9:
Age group -<36 months	7619	3185	41.8 [39.6-44]	3.7	0.072	0.89 [0.78]-[1.01]	0.396	0.91 [0.73]-[1.14]	0.039	0.87 [0.76]-[0.99]	0.145	0.91 [0.80]-[1.0:
Above average household size (>=6 members)	7320	3001	41 [37.7-44.2]	8	0.016	1.17 [1.03]-[1.32]	0.947	0.99 [0.81]-[1.22]	0.016	1.15 [1.03]-[1.29]	0.201	0.93 [0.84]-[1.04
Number of children under 5 >1	7320	3462	47.3 [43.7-50.8]	9.4	0.318	0.93 [0.82]-[1.07]	0.255	1.13 [0.92]-[1.38]	0.519	0.96 [0.84]-[1.09]	0.395	1.05 [0.94]-[1.1:
Household displaced by insecurity	7320	102	1.4 [0.9-1.8]	3.1	0.672	1.11 [0.67]-[1.85]	0.771	0.91 [0.46]-[1.78]	0.969	1.01 [0.64]-[1.59]	0.434	1.17 [0.79]-[1.74
Household displaced by drought	7320	505	6.9 [5.4-8.4]	6.4	0.839	1.03 [0.79]-[1.34]	0.147	0.73 [0.47]-[1.12]	0.845	0.98 [0.76]-[1.26]	0.104	0.78 [0.58]-[1.0!
Household displaced by eviction	7320	44	0.6 [0.4-0.9]	1.5	0.864	0.93 [0.39]-[2.23]	.	1 [1.00]-[1.00]	0.566	0.77 [0.32]-[1.87]	0.432	1.25 [0.71]-[2.1!
Household displaced by conflict	7320	403	5.5 [4.1-6.8]	6.5	0.17	0.82 [0.61]-[1.09]	0.684	0.91 [0.58]-[1.44]	0.331	0.87 [0.67]-[1.15]	0.723	0.95 [0.71]-[1.2:
Household displaced by loss of livelihood	7320	22	0.3 [0.2-0.5]	2	0.835	1.14 [0.33]-[3.96]	.	1 [1.00]-[1.00]	0.962	0.97 [0.28]-[3.41]	0.513	1.32 [0.57]-[3.0:
Primary occupation: Casual labour	7619	2850	37.4 [35.9-38.9]	1.9	0.764	0.98 [0.86]-[1.12]	0.419	1.07 [0.91]-[1.25]	0.981	1 [0.88]-[1.13]	0.401	1.05 [0.93]-[1.1!
Primary occupation: self employed	7619	1531	20.1 [18.3-21.9]	4	0.709	0.97 [0.83]-[1.14]	0.834	1.02 [0.81]-[1.29]	0.526	0.96 [0.83]-[1.10]	0.784	0.98 [0.85]-[1.1:
Primary occupation: petty trade	7619	1288	16.9 [14.8-19]	6	0.152	0.87 [0.71]-[1.05]	0.86	1.02 [0.79]-[1.33]	0.24	0.9 [0.76]-[1.07]	0.389	0.93 [0.78]-[1.1(
Primary occupation: other trade	7619	914	12 [9.7-14.4]	9.8	0.886	1.02 [0.81]-[1.28]	0.333	1.18 [0.84]-[1.65]	0.55	1.06 [0.87]-[1.30]	0.673	1.05 [0.84]-[1.3:
Primary occupation: other skilled trade	7619	998	13.1 [10.7-15.5]	9.6	0.257	1.14 [0.91]-[1.43]	0.095	1.33 [0.95]-[1.86]	0.134	1.16 [0.96]-[1.40]	0.47	1.08 [0.88]-[1.3:
Low wage (2/3 of mean wage per person per day)	3492	2504	71.7 [68.2-75.2]	5.5	0.148	0.85 [0.68]-[1.06]	0.801	0.96 [0.69]-[1.33]	0.354	0.9 [0.72]-[1.12]	0.274	0.9 [0.75]-[1.09
Income from: Sales Of Camel And Cattle	3595	7	0.2 [0-0.4]	1.5	0.033	2.93 [1.09]-[7.82]	.	1 [1.00]-[1.00]	0.074	2.45 [0.92]-[6.54]	.	1 [1.00]-[1.00]
Income from: Livestock Sale (Sheep/Goat)	3595	79	2.2 [1-3.3]	5.9	0.992	1 [0.49]-[2.02]	0.735	1.11 [0.61]-[2.02]	0.814	0.92 [0.47]-[1.82]	0.67	1.13 [0.63]-[2.0:
Income from: Poultry / Livestock Product (Milk, Meat, Egg, Ghee)	3595	7	0.2 [0-0.4]	1.5	0.073	10.72 [0.80]-[144.45]	0.162	3.62 [0.59]-[22.12]	0.095	8.85 [0.68]-[115.06]	0.75	0.75 [0.12]-[4.5:
Income from: Crop Sale	3595	32	0.9 [0.4-1.4]	2.3	0.07	1.88 [0.95]-[3.74]	0.701	1.3 [0.34]-[4.93]	0.058	1.9 [0.98]-[3.70]	0.308	0.62 [0.24]-[1.5:

Income from: Petty Trade	3595	604	16.8 [14.9-18.8]	2.4	0.705	0.95 [0.72]-[1.25]	0.018	0.6 [0.39]-[0.92]	0.285	0.87 [0.68]-[1.12]	0.008	0.74 [0.59]-[0.9.
Income from: Other Trade (Specify):	3595	137	3.8 [2.2-5.4]	6.6	0.491	0.84 [0.50]-[1.40]	0.201	0.68 [0.38]-[1.23]	0.279	0.78 [0.50]-[1.23]	0.363	0.74 [0.39]-[1.42
Income from: Casual Labour Wage (Portage, Construction, Etc.)	3595	1812	50.4 [47.6-53.3]	3	0.536	1.06 [0.89]-[1.26]	0.512	0.92 [0.71]-[1.19]	0.815	1.02 [0.86]-[1.22]	0.614	1.05 [0.87]-[1.2
Income from: Casual Labour Wage (Farm Labour)	3595	442	12.3 [10.5-14]	2.6	0.695	0.95 [0.75]-[1.22]	0.054	1.44 [0.99]-[2.08]	0.456	1.09 [0.86]-[1.39]	0.853	1.02 [0.80]-[1.3
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	3595	1028	28.6 [25.8-31.4]	3.5	0.043	0.8 [0.65]-[0.99]	0.454	0.9 [0.68]-[1.19]	0.098	0.85 [0.70]-[1.03]	0.185	1.11 [0.95]-[1.28
Income from: Skilled/Salary Work	3595	191	5.3 [4.4-6.3]	1.7	0.467	0.84 [0.53]-[1.35]	0.072	1.62 [0.96]-[2.74]	0.584	0.89 [0.59]-[1.35]	0.483	1.13 [0.80]-[1.6
Income from: Remittance	3595	32	0.9 [0.5-1.4]	1.7	0.601	1.3 [0.48]-[3.53]	0.867	0.89 [0.22]-[3.55]	0.871	1.09 [0.40]-[2.94]	0.755	1.11 [0.57]-[2.1
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	3595	147	4.1 [2.6-5.7]	5.6	0.174	1.36 [0.87]-[2.13]	0.018	1.71 [1.10]-[2.67]	0.095	1.37 [0.95]-[1.97]	0.024	1.5 [1.06]-[2.14
Income from: Humanitarian Assistance (Cash)	3595	399	11.1 [8.6-13.6]	5.8	0.404	0.87 [0.63]-[1.20]	0.054	1.39 [0.99]-[1.94]	0.64	0.93 [0.70]-[1.25]	0.611	1.07 [0.82]-[1.3
Income from: Productive Asset Sale	3595	7	0.2 [0-0.4]	1.9	0.884	0.85 [0.10]-[7.57]	.	1 [1.00]-[1.00]	0.81	0.77 [0.09]-[6.69]	.	1 [1.00]-[1.00]
Income from: Other Source of Cash Income	3595	14	0.4 [0.1-0.7]	1.6	0.595	0.65 [0.13]-[3.28]	0.753	0.71 [0.08]-[6.00]	0.815	0.85 [0.21]-[3.48]	0.24	0.39 [0.08]-[1.88
Has assets: any animals	3595	212	5.9 [4.3-7.5]	4.4	0.299	0.96 [0.88]-[1.04]	0.548	0.9 [0.65]-[1.26]	0.212	0.95 [0.87]-[1.03]	0.353	1.01 [0.99]-[1.03
Has assets: sheepgoat	3602	828	23 [20.2-25.8]	4.1	0.353	0.97 [0.91]-[1.03]	0.326	0.95 [0.85]-[1.05]	0.255	0.96 [0.90]-[1.03]	0.164	0.93 [0.84]-[1.03
Has assets: donkey	3596	619	17.2 [14.8-19.6]	3.7	0.489	0.91 [0.69]-[1.19]	0.857	0.97 [0.71]-[1.33]	0.648	0.95 [0.74]-[1.20]	0.577	0.94 [0.75]-[1.1
Has assets: chicken	3601	936	26 [23.3-28.6]	3.4	0.699	1.04 [0.85]-[1.28]	0.348	0.86 [0.63]-[1.18]	0.858	1.02 [0.83]-[1.26]	0.956	0.99 [0.82]-[1.2
Has assets: land	3596	1705	47.4 [42.6-52.3]	8.8	0.039	0.8 [0.64]-[0.99]	0.33	0.85 [0.61]-[1.18]	0.113	0.84 [0.67]-[1.04]	0.042	0.83 [0.70]-[0.9
Has assets: house	3605	3263	90.5 [88.5-92.5]	4.3	0.777	1.06 [0.72]-[1.54]	0.383	0.81 [0.50]-[1.31]	0.911	0.98 [0.68]-[1.41]	0.382	0.89 [0.69]-[1.15
Has assets: radio	3597	874	24.3 [20.5-28.1]	7.1	0.084	1.19 [0.98]-[1.45]	0.536	0.91 [0.67]-[1.23]	0.247	1.11 [0.93]-[1.34]	0.653	0.94 [0.73]-[1.22
Has assets: bike	3599	155	4.3 [3.3-5.3]	2.3	0.389	0.82 [0.52]-[1.30]	0.35	1.34 [0.72]-[2.50]	0.962	1.01 [0.66]-[1.55]	0.765	1.07 [0.69]-[1.6
Has assets: phone	3601	2856	79.3 [76.7-81.8]	3.6	0.979	1 [0.76]-[1.32]	0.66	0.92 [0.62]-[1.35]	0.96	1.01 [0.76]-[1.33]	0.881	1.02 [0.83]-[1.24
Has assets: agtools	3585	287	8 [6.4-9.6]	3.2	0.227	0.81 [0.58]-[1.14]	0.209	1.34 [0.85]-[2.12]	0.893	0.98 [0.73]-[1.32]	0.926	0.99 [0.72]-[1.3
Has assets: skwtools	3600	342	9.5 [7.5-11.4]	4.1	0.35	0.86 [0.63]-[1.18]	0.347	0.78 [0.47]-[1.31]	0.568	0.92 [0.69]-[1.22]	0.663	1.07 [0.79]-[1.43
Has assets: cart	3594	385	10.7 [8.7-12.7]	3.8	0.702	1.07 [0.77]-[1.48]	0.252	1.27 [0.84]-[1.94]	0.621	1.08 [0.79]-[1.47]	0.639	0.94 [0.72]-[1.2
Has assets: wheelbarrow	3593	129	3.6 [2.4-4.7]	3.4	0.85	1.05 [0.64]-[1.73]	0.131	1.43 [0.90]-[2.28]	0.657	1.11 [0.69]-[1.79]	0.084	0.65 [0.40]-[1.0
Spends over 80% of earnings on food	3556	594	16.7 [14.2-19.3]	4.2	0.977	1 [0.76]-[1.30]	0.369	1.19 [0.82]-[1.72]	0.675	1.05 [0.82]-[1.35]	0.059	0.81 [0.65]-[1.0
Has savings	3208	87	2.7 [1.4-4.1]	5.5	0.394	0.77 [0.43]-[1.40]	0.801	1.1 [0.53]-[2.28]	0.194	0.7 [0.40]-[1.20]	0.605	1.17 [0.64]-[2.1
Received humanitarian cereal food assistance	3084	1209	39.2 [35.7-42.7]	4	0.868	0.98 [0.76]-[1.27]	0.296	1.21 [0.85]-[1.72]	0.563	0.93 [0.73]-[1.19]	0.802	1.03 [0.81]-[1.3
Household had no money or food <30 days	1884	452	24 [19.1-29]	6.4	0.545	1.11 [0.79]-[1.55]	0.819	0.94 [0.58]-[1.55]	0.768	1.05 [0.77]-[1.42]	0.019	0.72 [0.55]-[0.9
Purchased cereal means other than cash	1470	390	26.5 [20.6-32.4]	6.6	0.893	0.98 [0.70]-[1.37]	0.71	1.1 [0.66]-[1.83]	0.965	1.01 [0.72]-[1.40]	0.429	1.14 [0.82]-[1.5

Purchased milk means other than cash	1258	214	17 [12.4-21.7]	4.8	0.698	1.08 [0.72]-[1.64]	0.795	1.07 [0.62]-[1.86]	0.897	0.97 [0.66]-[1.45]	0.624	0.9 [0.58]-[1.39
Received Vitamin A in last six months	8426	3379	40.1 [36.6-43.7]	11.4	0.748	0.97 [0.82]-[1.15]	0.027	0.76 [0.60]-[0.97]	0.489	0.94 [0.80]-[1.11]	0.939	0.99 [0.84]-[1.11
Received measles vaccination in last six months	8428	3439	40.8 [37.2-44.4]	11.6	0.761	1.02 [0.88]-[1.18]	0.225	0.88 [0.72]-[1.08]	0.497	1.05 [0.92]-[1.20]	0.783	0.98 [0.83]-[1.15
Received polio vaccination in last six months	7496	6229	83.1 [79.8-86.5]	15	0.358	0.95 [0.85]-[1.06]	0.004	0.76 [0.63]-[0.92]	0.185	0.93 [0.84]-[1.03]	0.245	1.07 [0.96]-[1.19
Diarrhoea in last 2 weeks	8449	431	5.1 [4.3-5.9]	2.8	0.012	1.41 [1.08]-[1.83]	0	5.18 [3.73]-[7.18]	0	2.02 [1.55]-[2.63]	0	1.58 [1.26]-[1.9
Pneumonia in last 2 weeks	8449	414	4.9 [4.1-5.7]	2.9	0.404	1.12 [0.85]-[1.48]	0	3.99 [2.76]-[5.76]	0.001	1.61 [1.23]-[2.12]	0.003	1.44 [1.14]-[1.8
fever in last 2 weeks	8452	735	8.7 [7.2-10.2]	6	0.003	1.49 [1.15]-[1.94]	0	2.13 [1.55]-[2.94]	0.001	1.53 [1.21]-[1.93]	0.201	1.13 [0.93]-[1.3
measles in last 2 weeks	8448	59	0.7 [0.4-1]	2.7	0.037	1.22 [1.01]-[1.47]	0.001	1.42 [1.15]-[1.74]	0.065	1.29 [0.98]-[1.69]	0.665	1.05 [0.85]-[1.29
morbidity in last two weeks	8505	1718	20.2 [16.9-23.4]	13.8	0	1.51 [1.25]-[1.82]	0	3.31 [2.59]-[4.23]	0	1.77 [1.47]-[2.12]	0.031	1.18 [1.02]-[1.3
Days, out of last 7, HH consumed: Cereals	3607	1721	47.7 [43.7-51.7]	5.8	0.703	0.9 [0.52]-[1.55]	0.749	1.15 [0.49]-[2.72]	0.779	0.93 [0.57]-[1.52]	0.103	1.43 [0.93]-[2.2
Days, out of last 7, HH consumed: White Roots And Tubers	3345	786	23.5 [19.1-27.9]	9.1	0.565	1.14 [0.72]-[1.80]	0.104	1.66 [0.90]-[3.07]	0.369	1.21 [0.80]-[1.84]	0.164	0.77 [0.53]-[1.12
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	3316	733	22.1 [17.8-26.5]	9.3	0.521	1.19 [0.69]-[2.06]	0.873	1.06 [0.50]-[2.26]	0.583	1.16 [0.68]-[1.98]	0.743	1.11 [0.58]-[2.13
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	3304	724	21.9 [17.8-26]	8.3	0.307	1.3 [0.78]-[2.16]	0.245	0.67 [0.33]-[1.33]	0.389	1.24 [0.76]-[2.01]	0.432	1.16 [0.80]-[1.69
Days, out of last 7, HH consumed: Other Vegetables	3410	1545	45.3 [41.2-49.4]	5.8	0.507	0.92 [0.72]-[1.18]	0.964	0.99 [0.69]-[1.43]	0.336	0.9 [0.71]-[1.12]	0.257	0.89 [0.72]-[1.09
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	3306	658	19.9 [15.6-24.3]	10	0.129	1.5 [0.89]-[2.55]	0.204	0.48 [0.16]-[1.50]	0.299	1.32 [0.78]-[2.24]	0.183	0.49 [0.17]-[1.40
Days, out of last 7, HH consumed: Other Fruits	3320	717	21.6 [17.1-26.1]	10.1	0.831	1.08 [0.52]-[2.25]	0.49	0.74 [0.31]-[1.77]	0.647	1.16 [0.62]-[2.16]	0.1	0.69 [0.44]-[1.08
Days, out of last 7, HH consumed: Organ Meat	3312	672	20.3 [15.8-24.8]	10.4	0.47	1.3 [0.64]-[2.63]	0.589	0.8 [0.36]-[1.79]	0.758	1.11 [0.56]-[2.22]	0.705	0.88 [0.46]-[1.69
Days, out of last 7, HH consumed: Flesh Meats	3321	790	23.8 [19.4-28.2]	8.9	0.256	0.78 [0.51]-[1.20]	0.28	0.67 [0.32]-[1.39]	0.221	0.77 [0.51]-[1.17]	0.367	0.85 [0.60]-[1.2
Days, out of last 7, HH consumed: Eggs	3305	654	19.8 [15.3-24.3]	10.6	0.008	2.03 [1.20]-[3.41]	0.292	1.6 [0.66]-[3.86]	0.01	1.94 [1.18]-[3.19]	0.965	1.02 [0.42]-[2.49
Days, out of last 7, HH consumed: Fish And Seafood	3312	659	19.9 [15.5-24.3]	10.2	0.895	1.05 [0.52]-[2.12]	0.58	0.7 [0.19]-[2.53]	0.898	1.05 [0.49]-[2.27]	0.684	0.84 [0.36]-[1.9
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	3491	1627	46.6 [43.5-49.7]	3.4	0.258	0.9 [0.74]-[1.09]	0.565	0.91 [0.64]-[1.27]	0.438	0.93 [0.77]-[1.12]	0.964	1 [0.83]-[1.21
Days, out of last 7, HH consumed: Milk And Milk Products	3438	1918	55.8 [51.2-60.3]	7.3	0.254	1.13 [0.92]-[1.39]	0.784	1.05 [0.73]-[1.51]	0.194	1.14 [0.93]-[1.40]	0.459	1.08 [0.88]-[1.33
Days, out of last 7, HH consumed: Oils And Fats	3564	1921	53.9 [49.5-58.3]	7.1	0.599	0.89 [0.56]-[1.39]	0.403	0.76 [0.40]-[1.44]	0.368	0.83 [0.56]-[1.24]	0.426	1.15 [0.81]-[1.65
Days, out of last 7, HH consumed: Sweets	3579	2208	61.7 [56.3-67.1]	11.2	0.54	0.91 [0.67]-[1.24]	0.18	1.31 [0.88]-[1.93]	0.79	0.96 [0.73]-[1.27]	0.101	1.28 [0.95]-[1.73
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	3512	1549	44.1 [40-48.3]	6.2	0.444	0.88 [0.63]-[1.23]	0.182	1.41 [0.85]-[2.35]	0.558	0.92 [0.69]-[1.22]	0.129	1.26 [0.93]-[1.70
Days, out of last 7, HH consumed: Any veg	3428	2012	58.7 [54.3-63.1]	6.9	0.468	0.91 [0.69]-[1.19]	0.273	0.82 [0.58]-[1.17]	0.206	0.85 [0.67]-[1.09]	0.529	0.93 [0.75]-[1.1
Days, out of last 7, HH consumed: Any fruit	3328	755	22.7 [18.2-27.2]	9.8	0.605	1.16 [0.66]-[2.05]	0.293	0.65 [0.29]-[1.45]	0.543	1.17 [0.71]-[1.93]	0.022	0.59 [0.38]-[0.9

	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	OR [CI]
Days, out of last 7, HH consumed: Any meat	3338	868	26 [21.4-30.6]	9.5	0.573	0.89 [0.59]-[1.34]	0.358	0.75 [0.40]-[1.40]	0.4	0.84 [0.56]-[1.26]	0.174	0.78 [0.55]-[1.12
HDD: Four+ food groups in last 7 days	7619	2964	38.9 [37.4-40.5]	2	0.56	1.04 [0.91]-[1.20]	0.297	1.1 [0.92]-[1.33]	0.707	1.02 [0.90]-[1.16]	0.633	1.03 [0.91]-[1.17
HDD: Four+ food groups in last 7 dayless than mean score	7619	4198	55.1 [53.8-56.5]	1.5	0.749	0.98 [0.86]-[1.12]	0.272	0.91 [0.77]-[1.08]	0.999	1 [0.89]-[1.13]	0.709	0.98 [0.87]-[1.10
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	1573	900	57.2 [51.6-62.7]	5.1	0.219	1.2 [0.90]-[1.61]	0.171	1.31 [0.89]-[1.92]	**0.025**	**1.34 [1.04]-[1.74]**	0.982	1 [0.74]-[1.37
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	1628	651	40 [35.3-44.7]	3.8	0.888	0.98 [0.69]-[1.38]	0.707	1.08 [0.72]-[1.63]	0.654	1.07 [0.79]-[1.45]	0.085	0.79 [0.60]-[1.03
Days, out of last 7, HH: Took fewer numbers of meals in a day	1616	708	43.8 [38.4-49.1]	4.7	0.768	0.95 [0.69]-[1.31]	0.971	0.99 [0.64]-[1.53]	0.894	1.02 [0.75]-[1.38]	0.856	0.97 [0.73]-[1.30
Days, out of last 7, HH: Borrowed food on credit from the shop/market	1114	642	57.6 [50.2-65]	6.3	0.619	0.91 [0.63]-[1.32]	0.052	0.62 [0.39]-[1.00]	0.532	0.89 [0.62]-[1.28]	0.56	1.1 [0.80]-[1.52
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	1112	461	41.5 [34.9-48]	4.9	0.667	1.09 [0.74]-[1.60]	0.833	0.95 [0.59]-[1.54]	0.459	1.14 [0.80]-[1.64]	0.106	0.76 [0.54]-[1.06
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	1663	373	22.4 [17.9-27]	5	0.662	1.08 [0.77]-[1.49]	0.257	0.75 [0.45]-[1.24]	0.911	1.02 [0.73]-[1.42]	0.63	0.92 [0.66]-[1.29
Days, out of last 7, HH: Relied on food donations from relatives	1654	500	30.2 [25.7-34.6]	3.9	0.507	0.88 [0.61]-[1.28]	0.267	1.23 [0.85]-[1.79]	0.951	1.01 [0.72]-[1.41]	0.943	1.01 [0.76]-[1.34
Days, out of last 7, HH: Relied on food donations from the clan/community	1113	145	13 [9.5-16.5]	3	0.576	0.86 [0.50]-[1.47]	0.526	0.8 [0.39]-[1.62]	0.484	0.82 [0.48]-[1.43]	0.968	1.01 [0.69]-[1.46
Days, out of last 7, HH: Sought or rely on food aid from humanitarian agency	1113	86	7.7 [4.9-10.5]	3.1	0.476	1.25 [0.67]-[2.36]	0.939	0.97 [0.45]-[2.09]	0.564	1.19 [0.65]-[2.17]	0.686	0.89 [0.49]-[1.61
Days, out of last 7, HH: Sent household members to eat elsewhere	1114	81	7.3 [5.1-9.4]	1.9	0.902	0.96 [0.48]-[1.90]	0.197	0.44 [0.13]-[1.54]	0.723	0.88 [0.43]-[1.80]	0.794	1.08 [0.60]-[1.96
Days, out of last 7, HH: Begged for food	1111	14	1.3 [0.3-2.2]	2.2	0.938	0.95 [0.25]-[3.57]	0.807	0.8 [0.13]-[5.07]	0.808	1.19 [0.28]-[5.11]	0.928	0.94 [0.25]-[3.5
Days, out of last 7, HH: Skipped entire days without eating	1109	47	4.2 [2.6-5.9]	1.9	0.13	1.7 [0.85]-[3.39]	0.937	1.05 [0.29]-[3.82]	0.174	1.59 [0.81]-[3.13]	0.747	1.11 [0.58]-[2.15
Days, out of last 7, HH: Consumed spoilt or left-over foods	1680	24	1.4 [0.5-2.4]	2.6	0.681	1.25 [0.42]-[3.71]	0.573	0.55 [0.07]-[4.51]	0.617	1.3 [0.46]-[3.68]	0.141	0.46 [0.16]-[1.30
WASH: Main source of drinking water unprotected	3155	256	8.1 [4.4-11.8]	11.8	0.609	1.18 [0.63]-[2.22]	0.72	1.14 [0.55]-[2.34]	0.766	1.09 [0.62]-[1.91]	0.903	1.03 [0.64]-[1.67
WASH: Toilet used by most members of the household	3,163	278	8.8 [6-11.6]	14.6	0.052	1.53 [1.00]-[2.34]	**0.034**	**2.31 [1.06]-[4.99]**	0.055	1.53 [0.99]-[2.37]	0.463	1.18 [0.76]-[1.83
Mother has any education	1784	171	9.6 [6.8-12.4]	4.1	0.813	0.96 [0.66]-[1.38]	0.122	1.51 [0.89]-[2.54]	0.903	0.98 [0.67]-[1.43]	0.586	0.9 [0.61]-[1.33
Mother slept under a mosquito net last night	1781	1484	83.3 [80.3-86.2]	2.8	0.771	0.96 [0.72]-[1.28]	0.496	0.82 [0.45]-[1.48]	0.525	0.91 [0.68]-[1.22]	0.692	1.07 [0.77]-[1.49
Mother has any education	6767	4020	59.4 [58.2-60.6]	1	**0**	**0.79 [0.69]-[0.89]**	**0**	**15.31 [9.70]-[24.18]**	0.118	1.1 [0.98]-[1.24]	**0**	**3.34 [2.86]-[3.9**
Mother slept under mosquito net last night	6321	3116	49.3 [47.3-51.2]	2.4	0.473	1.05 [0.92]-[1.19]	0.883	1.01 [0.85]-[1.21]	0.676	1.03 [0.90]-[1.17]	0.276	0.94 [0.83]-[1.06

ANNEX B: COMBINED LINEAR REGRESSION

Table 21: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression (All FSNAU data combined 2014-2020

Risk factor		GAM [W/H]			GAM [MUAC]			Stunting [H/A]			
Linear Regression		*Children 6-59 months*			*Children 6-59 months*			*Children 6-59 months*			
Indicator	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value
Child's age	1.2	0	-0.01	0.001	0	0.183	0.009	0	0.012	0.001	0.646
Number of children <5 yrs in HH	1.5	0.867	0.002	0.012	0.184	0.064	0.048	0.318	0.015	0.015	0.49
Percentage of spending on food	3.6	0.58	-0.001	0.003	0.182	0.018	0.014	0.452	0.002	0.003	0.987
Amount of savings	2.1	0.078	0.027	0.015	0.403	0.116	0.138	0.093	-0.045	0.027	0.734
Number of food groups consumed by HH	1.1	0.129	-0.009	0.006	0.895	-0.005	0.039	0.674	-0.003	0.007	0.124
Days, out of last 7, HH consumed: Cereals	1.6	0.639	0.005	0.01	0.015	0.074	0.03	0.013	0.028	0.011	0.03
Days, out of last 7, HH consumed: Milk And Milk Products	6.3	0.604	0.004	0.008	0.163	-0.125	0.089	0.049	-0.018	0.009	0.332
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	1.9	0.346	0.026	0.027	0.911	-0.011	0.099	0.594	0.024	0.045	0.418
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	3	0.696	0.01	0.026	0.229	0.162	0.134	0.84	0.007	0.033	0.64
Days, out of last 7, HH consumed: Other Vegetables	3.2	0.438	0.01	0.012	0.973	0.002	0.072	0.917	0.001	0.012	0.544
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	1.5	0.71	0.014	0.037	0.725	-0.05	0.142	0.232	0.065	0.054	0.182
Days, out of last 7, HH consumed: Other Fruits	4.2	0.924	-0.003	0.028	0.792	0.027	0.101	0.027	0.077	0.035	0.105
Days, out of last 7, HH consumed: Organ Meat	2.3	0.518	0.026	0.04	0.81	0.038	0.156	0.029	0.083	0.038	0.045
Days, out of last 7, HH consumed: Flesh Meats	3	0.179	-0.02	0.015	0.079	-0.135	0.076	0.699	0.008	0.02	0.403
Days, out of last 7, HH consumed: Eggs	3.5	0.258	-0.039	0.035	0.134	0.417	0.276	0.442	-0.032	0.042	0.131
Days, out of last 7, HH consumed: Fish And Seafood	3.3	0.946	0.002	0.035	0.658	0.112	0.253	0.486	0.024	0.035	0.672
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	2.7	0.402	0.009	0.011	0.778	-0.015	0.052	0.945	-0.001	0.007	0.367
Days, out of last 7, HH consumed: White Roots And Tubers	3.7	0.889	0.002	0.017	0.595	0.038	0.07	0.39	0.018	0.021	0.467
Days, out of last 7, HH consumed: Oils And Fats	2.9	0.785	0.003	0.012	0.094	-0.071	0.042	0.363	0.011	0.012	0.458
Days, out of last 7, HH consumed: Sweets	4.2	0.463	0.006	0.009	0.116	-0.064	0.04	0.523	-0.008	0.013	0.986
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	3.1	0.838	0.002	0.011	0.956	-0.002	0.043	0.076	-0.022	0.012	0.308
Days, out of last 7, HH consumed: Any veg	2.8	0.424	0.026	0.033	0.707	0.069	0.183	0.952	-0.002	0.035	0.63
Days, out of last 7, HH consumed: Any fruit	1.8	0.965	-0.002	0.051	0.975	-0.005	0.161	0.02	0.144	0.061	0.055

Days, out of last 7, HH consumed: Any meat	3.4	0.465	-0.023	0.031	0.219	-0.174	0.14	0.218	0.045	0.036	0.903
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	6.6	0.448	0.011	0.014	0.005	-0.178	0.062	0.583	-0.006	0.012	0.576
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	7.7	0.199	0.019	0.015	0.001	-0.3	0.09	0.332	0.015	0.015	0.034
Days, out of last 7, HH: Took fewer numbers of meals in a day	11.3	0.512	0.009	0.014	0	-0.388	0.1	0.629	0.008	0.016	0.304
Days, out of last 7, HH: Borrowed food on credit from the shop/market	3.1	0.693	-0.012	0.031	0.263	0.235	0.209	0.603	0.019	0.036	0.864
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	4.7	0.007	-0.096	0.035	0.684	0.104	0.254	0.538	0.024	0.039	0.028
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	3.5	0.755	0.008	0.026	0.862	0.026	0.148	0.656	-0.011	0.025	0.735
Days, out of last 7, HH: Relied on food donations from relatives	4.2	0.757	0.006	0.02	0.513	0.076	0.116	0.5	0.013	0.02	0.321
Days, out of last 7, HH: Relied on food donations from the clan/community	3.5	0.602	-0.026	0.05	0.659	-0.138	0.312	0.303	0.068	0.066	0.587
Days, out of last 7, HH: Sought or rely on food aid from humanitarian agency	3.4	0.131	-0.078	0.051	0.309	-0.441	0.43	0.171	0.093	0.067	0.946
Days, out of last 7, HH: Sent household members to eat elsewhere	1.7	0.02	-0.121	0.051	0.171	-0.4	0.289	0.716	-0.037	0.102	0.121
Days, out of last 7, HH: Begged for food	5.9	0	-0.108	0.029	0.574	-0.067	0.119	0.042	0.152	0.073	0.835
Days, out of last 7, HH: Skipped entire days without eating	2.1	0.231	-0.087	0.072	0.301	0.279	0.268	0.303	0.087	0.084	0.849
Days, out of last 7, HH: Consumed spoilt or left-over foods	1.4	0.274	-0.058	0.053	0.975	0.006	0.179	0.572	0.037	0.065	0.7
Mother's age	1.5	0.402	-0.002	0.002	0.081	0.026	0.015	0.162	0.003	0.002	0.486
Mother's MUAC	1.6	0.137	-0.001	0	0.29	-0.007	0.007	0.005	0.001	0	0.421
Number of Tet vaccin	1.3	0.324	0.034	0.035	0.148	-0.211	0.144	0.117	-0.053	0.033	0.946
Size of members in HH	1.8	0.047	-0.019	0.009	0.035	0.122	0.057	0.62	-0.006	0.012	0.059
Number of days child experienced diarrhoea	0.9	0	-0.079	0.021	0	-0.678	0.116	0	-0.068	0.019	0

ANNEX C: LOGISTIC REGRESSION

Table 22: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2014 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		Stunting *Children 6-59 months*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Main provider female	568	86	15.1 [11.1-19.2]	1.7	0.388	0.69 [0.29]-[1.65]	0.575	0.8 [0.36]-[1.77]	0.243	0.64 [0.30]-[1.38]	0.883	1.05 [0.51]-[2.16]
Age group -<24 months	493	196	39.8 [35.9-43.6]	2	0.024	1.9 [1.10]-[3.28]	0	6.02 [2.83]-[12.80]	0.001	2.46 [1.48]-[4.10]	0.012	1.9 [1.17]-[3.09]
Age group -<36 months	493	325	65.9 [61.3-.70]	1.1	0.688	1.11 [0.69]-[.67]	0.006	9.7 [2.0]-[46.7]	0. 0.164	1.42 [0.86]-[2.34]	0.006	2.46 [1.32]-[4.60]
Above average household size (> =6 members)	572	269	47. [39.8-54.3]	2.9	0.788	.93 [.52]-[1.63]	0.728	1.153 [.52]-[2.6]	0.947	1.02 [0.60]-[1.72]	0.02	1.5 [1.06]-[2.02]
Number of children under 5 >1	493	108	22 [17-27.1]	5.2	0.03	0.56 [0.33]-[0.94]	0.693	1.14 [0.57]-[2.28]	0.071	0.64 [0.40]-[1.04]	0.462	1.17 [0.76]-[1.81]
Household displaced by insecurity	572	285	49.8 [40-59.6]	4.9	0.363	1.23 [0.78]-[1.96]	0.901	0.96 [0.53]-[1.74]	0.159	1.31 [0.89]-[1.92]	0.496	0.89 [0.62]-[1.27]
Household displaced by drought	568	341	60 [50.7-69.4]	2.5	0.574	1.17 [0.66]-[2.08]	0.96	1.02 [0.51]-[2.01]	0.835	1.05 [0.66]-[1.68]	0.421	0.85 [0.57]-[1.28]
Household displaced by eviction	568	5	0.9 [-0.4-2.2]	3.1	0.867	1.18 [0.16]-[8.63]	0.154	4.29 [0.56]-[32.74]	0.993	0.99 [0.13]-[7.30]	0	2.52 [1.92]-[3.31]
Household displaced by conflict	568	23	4 [1.1-7]	1	0.692	0.82 [0.31]-[2.21]	.	1 [1.00]-[1.00]	0.456	0.69 [0.25]-[1.88]	0.268	1.57 [0.69]-[3.57]
Household displaced by loss of livelihood	568	14	2.5 [0.4-4.6]	1.5	0.307	0.35 [0.04]-[2.78]	0.795	1.27 [0.20]-[7.97]	0.495	0.66 [0.19]-[2.28]	0.92	1.07 [0.26]-[4.43]
Primary occupation: Casual labor	568	165	29 [22.5-35.5]	1.7	0.747	1.07 [0.68]-[1.69]	0.535	1.28 [0.57]-[2.85]	0.381	1.2 [0.79]-[1.83]	0.941	0.98 [0.55]-[1.74]
Primary occupation: self employed	572	27	4.7 [2.4-7.1]	1.5	0.123	0.19 [0.02]-[1.62]	0.611	1.43 [0.34]-[6.01]	0.287	0.55 [0.18]-[1.70]	0.662	0.83 [0.35]-[1.98]
Primary occupation: petty trade	572	23	4 [2-6.1]	1.7	.	1 [1.00]-[1.00]	0.372	1.86 [0.46]-[7.54]	0.243	0.45 [0.11]-[1.78]	0.683	0.83 [0.33]-[2.10]
Primary occupation: other trade	572	22	3.8 [1.7-6]	2.7	.	1 [1.00]-[1.00]	0.372	1.86 [0.46]-[7.54]	0.243	0.45 [0.11]-[1.78]	0.683	0.83 [0.33]-[2.10]
Low wage (2/3 of mean wage per person per day)	316	215	68 [59.2-76.9]	1.2	0.443	0.79 [0.42]-[1.48]	0.247	0.55 [0.19]-[1.55]	0.511	0.82 [0.44]-[1.52]	0.326	0.72 [0.37]-[1.40]
Income from: Livestock Sale (Sheep/Goat)	325	5	1.5 [0-3]	1.6	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	325	5	1.5 [-0.2-3.3]	1	0.228	6.17 [0.30]-[126.41]	0.03	5.95 [1.20]-[29.45]	0.268	5.3 [0.26]-[108.70]	0.755	1.27 [0.27]-[5.93]
Income from: Petty Trade	325	47	14.5 [8.6-20.3]	3.2	0.747	1.15 [0.49]-[2.71]	0.803	1.16 [0.34]-[4.01]	0.932	0.97 [0.42]-[2.20]	0.362	0.67 [0.28]-[1.61]
Income from: Casual Labour Wage (Portage, Construction, Etc.)	325	115	35.4 [25.8-45]	3.1	0.629	1.15 [0.64]-[2.09]	0.119	0.44 [0.15]-[1.25]	0.992	1 [0.57]-[1.78]	0.836	0.93 [0.46]-[1.89]
Income from: Casual Labour Wage (Farm Labour)	325	46	14.2 [7.2-21.2]	3.5	0.695	1.17 [0.52]-[2.61]	0.096	2.45 [0.84]-[7.08]	0.438	1.3 [0.65]-[2.60]	0.175	1.75 [0.77]-[3.96]
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	325	124	38.2 [27.9-48.4]	1.6	0.128	0.58 [0.29]-[1.18]	0.394	0.6 [0.18]-[2.01]	0.156	0.61 [0.31]-[1.22]	0.873	1.04 [0.60]-[1.82]
Income from: Skilled/Salary Work	325	23	7.1 [3.3-10.8]	2.6	.	1 [1.00]-[1.00]	0.507	1.58 [0.39]-[6.32]	0.134	0.35 [0.09]-[1.41]	0.914	1.06 [0.37]-[3.06]

	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	OR [CI]
Income from: Remittance	325	7	2.2 [-0.5-4.8]	5.4	0.18	3.1 [0.58]-[16.72]	0.457	1.95 [0.32]-[11.88]	0.242	2.66 [0.50]-[14.22]	0.129	1.94 [0.81]-[4.61]
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	325	25	7.7 [0.7-14.7]	0.8	0.017	2.99 [1.24]-[7.23]	0.169	2.34 [0.68]-[8.00]	0.035	2.53 [1.07]-[5.98]	0.003	3.12 [1.52]-[6.41]
Has assets: any animals	327	14	4.3 [1.9-6.7]	3.3	0.488	0.7 [0.24]-[2.00]	0.423	1.38 [0.61]-[3.11]	0.715	0.87 [0.41]-[1.87]	0.012	2.89 [1.29]-[6.48]
Has assets: sheepgoat	327	103	31.5 [21.9-41.1]	1.8	0.511	1.21 [0.68]-[2.14]	0.018	2.02 [1.14]-[3.59]	0.515	1.18 [0.70]-[1.98]	0.403	1.34 [0.66]-[2.73]
Has assets: donkey	327	48	14.7 [9.4-20]	2.6	0.332	0.67 [0.29]-[1.55]	0.982	1.01 [0.34]-[3.01]	0.534	0.81 [0.41]-[1.60]	0.544	1.26 [0.59]-[2.71]
Has assets: chicken	327	75	22.9 [15.3-30.6]	5.5	0.021	2.67 [1.17]-[6.08]	0.084	2.11 [0.90]-[4.95]	0.006	2.84 [1.38]-[5.86]	0.8	0.9 [0.40]-[2.06]
Has assets: land	327	75	22.9 [11.8-34]	3.1	0.84	0.92 [0.42]-[2.04]	0.158	2.06 [0.74]-[5.71]	0.252	1.44 [0.76]-[2.71]	0.457	0.78 [0.40]-[1.53]
Has assets: house	327	295	90.2 [84.3-96.1]	4.6	0.033	9.43 [1.21]-[73.52]	0.959	1.05 [0.14]-[8.21]	0.124	3.24 [0.71]-[14.76]	0.417	0.76 [0.39]-[1.49]
Has assets: radio	327	78	23.9 [13.6-34.1]	1.6	0.845	1.07 [0.55]-[2.09]	0.162	1.66 [0.80]-[3.44]	0.494	1.21 [0.69]-[2.11]	0.45	1.39 [0.58]-[3.31]
Has assets: phone	327	211	64.5 [55-74.1]	1.3	0.388	1.3 [0.70]-[2.43]	0.429	1.61 [0.48]-[5.43]	0.329	1.33 [0.74]-[2.37]	0.914	0.97 [0.59]-[1.61]
Has assets: agtools	327	16	4.9 [2.1-7.7]	2.3	0.363	1.54 [0.59]-[4.04]	0.087	4.31 [0.80]-[23.38]	0.051	2.76 [0.99]-[7.66]	0.945	0.95 [0.22]-[4.07]
Has assets: skwtools	326	28	8.6 [3.8-13.4]	2	0.387	0.58 [0.16]-[2.07]	0.654	0.65 [0.10]-[4.47]	0.539	0.72 [0.25]-[2.10]	0.79	1.16 [0.37]-[3.63]
Spends over 80% of earnings on food	320	118	36.9 [25.3-48.4]	5.5	0.956	0.98 [0.48]-[2.00]	0.839	1.12 [0.35]-[3.62]	0.392	1.3 [0.70]-[2.42]	0.091	0.57 [0.30]-[1.10]
Has savings	318	50	15.7 [5.9-25.5]	3.8	0.688	0.84 [0.36]-[1.99]	0.608	1.33 [0.43]-[4.15]	0.617	0.83 [0.38]-[1.78]	0.253	1.46 [0.75]-[2.84]
Received humanitarian cereal food assistance	321	48	15 [7.1-22.8]	3.1	0.529	0.7 [0.23]-[2.18]	0.987	0.99 [0.33]-[2.96]	0.339	0.59 [0.20]-[1.78]	0.004	2.63 [1.40]-[4.94]
Household had no money or food <30 days	314	59	18.8 [10.9-26.7]	4	0.759	0.86 [0.31]-[2.34]	0.132	2.13 [0.79]-[5.75]	0.755	0.87 [0.35]-[2.18]	0.237	0.6 [0.25]-[1.42]
Purchased cereal means other than cash	326	83	25.5 [15.6-35.3]	0	0.512	0.78 [0.36]-[1.69]	0.876	0.92 [0.30]-[2.79]	0.375	0.72 [0.34]-[1.52]	0.127	1.7 [0.85]-[3.39]
Purchased milk means other than cash	326	28	8.6 [1.9-15.3]	4.3	0.786	1.15 [0.42]-[3.16]	0.207	1.95 [0.68]-[5.62]	0.957	0.97 [0.36]-[2.65]	0	3.15 [1.82]-[5.43]
Male child	493	232	47.1 [42-52.1]	1.2	0.012	1.79 [1.15]-[2.80]	0.76	1.14 [0.49]-[2.63]	0.037	1.63 [1.03]-[2.57]	0.442	1.19 [0.75]-[1.89]
Received Vitamin A in last six months	326	326	100	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]
Received measles vaccination in last six months	326	326	100	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]
Received polio vaccination in last six months	493	142	28.8 [20.2-37.5]	2.2	0.937	1.01 [0.79]-[1.30]	0.854	0.98 [0.74]-[1.28]	0.651	1.06 [0.83]-[1.35]	0.39	0.91 [0.72]-[1.14]
Diarrhoea in last 2 weeks	493	54	11 [6.7-15.2]	2.2	0.247	1.57 [0.72]-[3.42]	0.21	1.7 [0.73]-[3.99]	0.157	1.57 [0.83]-[2.97]	0.008	2.59 [1.31]-[5.15]
Pneumonia in last 2 weeks	493	54	11 [6.7-15.2]	2.7	0.247	1.57 [0.72]-[3.42]	0.21	1.7 [0.73]-[3.99]	0.157	1.57 [0.83]-[2.97]	0.008	2.59 [1.31]-[5.15]
fever in last 2 weeks	493	111	22.5 [16.2-28.8]	1.2	0.145	1.61 [0.84]-[3.08]	0.648	0.82 [0.34]-[1.98]	0.154	1.52 [0.85]-[2.72]	0.334	1.32 [0.74]-[2.33]
measles in last 2 weeks	493	6	1.2 [0.1-2.3]	2.8	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]
morbidity in last two weeks	493	141	28.6 [21.7-35.5]	0	0.08	1.63 [0.94]-[2.83]	0.879	0.96 [0.53]-[1.71]	0.068	1.54 [0.97]-[2.47]	0.128	1.42 [0.90]-[2.24]
HDD: Cereals in last 24 hr	325	325	100 [100-100]	1.2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]
HDD: White Roots And Tubers in last 24 hr	325	11	3.4 [1.1-5.6]	1.3	0.995	1.01 [0.17]-[5.87]	0.074	4.13 [0.86]-[19.80]	0.864	0.86 [0.15]-[4.87]	0.785	0.84 [0.24]-[2.98]
HDD: Vitamin A Rich Vegetables in last 24 hr	325	7	2.2 [0.3-4.1]	1.7	.	1 [1.00]-[1.00]	0.346	2.36 [0.38]-[14.71]	0.5	0.51 [0.07]-[3.78]	0.585	0.5 [0.04]-[6.47]

Indicator	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	OR [CI]
HDD: Dark Green Leafy Vegetables in last 24 hr	325	11	3.4 [0.7-6]	2.5	.	1 [1.00]-[1.00]	0.682	1.45 [0.23]-[9.23]	0.318	0.36 [0.05]-[2.79]	0.306	0.31 [0.03]-[3.11]
HDD: Other Vegetables in last 24 hr	325	110	33.8 [25.4-42.3]	1	0.069	0.4 [0.15]-[1.08]	0.546	0.65 [0.15]-[2.79]	0.159	0.52 [0.20]-[1.31]	0.141	0.68 [0.40]-[1.15]
HDD: Legumes, Nuts And Seeds in last 24 hr	325	165	50.8 [39.9-61.6]	3.7	0.868	0.95 [0.49]-[1.84]	0.938	0.97 [0.49]-[1.93]	0.545	0.84 [0.47]-[1.50]	0.879	1.05 [0.56]-[1.97]
HDD: Milk And Milk Products	325	114	35.1 [24.7-45.5]	1.4	0.975	1.01 [0.59]-[1.73]	0.909	1.04 [0.50]-[2.18]	0.798	1.06 [0.65]-[1.74]	0.209	0.68 [0.36]-[1.26]
HDD: Oils And Fats	325	307	94.5 [91.4-97.5]	1.3	0.508	2.06 [0.23]-[18.63]	.	1 [1.00]-[1.00]	0.425	2.4 [0.26]-[21.96]	0.44	0.61 [0.17]-[2.21]
HDD: Sweets	325	321	98.8 [97.4-100.2]	3.6	0.359	0.32 [0.03]-[3.85]	.	1 [1.00]-[1.00]	0.427	0.38 [0.03]-[4.48]	0.138	0.13 [0.01]-[2.03]
HDD: Spices, Condiments, Beverages	325	271	83.4 [75.4-91.4]	2.6	0.006	3.11 [1.43]-[6.79]	.	1 [1.00]-[1.00]	0.002	3.67 [1.68]-[8.02]	0.079	2.17 [0.91]-[5.16]
HDD: Any veg	325	117	36 [27.3-44.7]	1	0.049	0.36 [0.13]-[1.00]	0.679	0.77 [0.21]-[2.80]	0.141	0.52 [0.22]-[1.26]	0.148	0.66 [0.37]-[1.17]
HDD: Any meat	325	5	1.5 [-0.6-3.7]	1.7	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.504	2.59 [0.15]-[46.08]
HDD: Four+ food groups in last 7 days	325	170	52.4 [46.8-58.1]	1.5	0.087	1.4 [0.95]-[2.07]	0.288	1.47 [0.71]-[3.04]	0.128	1.37 [0.91]-[2.05]	0.937	0.99 [0.67]-[1.45]
HDD: Four+ food groups in last 7 dayless than mean score	325	141	43.4 [38.1-48.6]	5	0.108	0.71 [0.47]-[1.08]	0.521	0.8 [0.39]-[1.63]	0.183	0.75 [0.49]-[1.15]	0.918	1.02 [0.68]-[1.53]
Past 7 days: Shifted to less preferred (low quality, less expensive) foods	572	208	36.4 [24.3-48.5]	3.7	0.194	1.41 [0.83]-[2.41]	0.952	1.03 [0.38]-[2.77]	0.034	1.66 [1.04]-[2.66]	0.788	1.11 [0.51]-[2.39]
Past 7 days: Limited the portion/quantity consumed in a meal	327	137	41.9 [31.2-52.6]	4.4	0.753	1.13 [0.52]-[2.44]	0.288	1.74 [0.61]-[4.96]	0.324	1.4 [0.71]-[2.75]	0.438	0.77 [0.39]-[1.52]
Past 7 days: Took fewer numbers of meals in a day	327	126	38.5 [26.9-50.1]	4	0.021	2.17 [1.13]-[4.17]	0.9	1.07 [0.37]-[3.09]	0.007	2.31 [1.29]-[4.14]	0.542	0.84 [0.48]-[1.49]
Past 7 days: Borrowed food on credit from the shop/market	327	192	58.7 [47.6-69.9]	3.8	0.879	1.07 [0.46]-[2.47]	0.612	1.3 [0.46]-[3.72]	0.626	1.21 [0.54]-[2.71]	0.094	1.59 [0.92]-[2.75]
Past 7 days: Borrowed food on credit from another household (Amaah)?	327	112	34.3 [23.7-44.8]	3.1	0.936	1.03 [0.46]-[2.31]	0.502	1.39 [0.52]-[3.70]	0.667	1.16 [0.57]-[2.36]	0.176	0.64 [0.34]-[1.23]
Past 7 days: Restricted consumption of adults for small children to eat?	327	33	10.1 [4.1-16.1]	2.6	0.386	1.5 [0.58]-[3.87]	.	1 [1.00]-[1.00]	0.599	1.27 [0.51]-[3.17]	0.782	1.08 [0.61]-[1.91]
Past 7 days: Relied on food donations from relatives	327	37	11.3 [5.5-17.1]	3.3	0.817	0.82 [0.15]-[4.52]	0.995	1 [0.21]-[4.63]	0.667	0.7 [0.13]-[3.74]	0.3	1.5 [0.68]-[3.27]
Past 7 days: Relied on food donations from the clan/community	327	27	8.3 [2.6-13.9]	4.5	0.824	0.85 [0.20]-[3.67]	0.732	1.3 [0.27]-[6.23]	0.661	0.73 [0.17]-[3.16]	0.04	0.61 [0.39]-[0.98]
Past 7 days: Sought or rely on food aid from humanitarian agency	327	22	6.7 [0.7-12.8]	1.8	0.804	1.17 [0.32]-[4.38]	0.586	0.66 [0.14]-[3.14]	0.998	1 [0.28]-[3.59]	0.044	2.09 [1.02]-[4.29]
Past 7 days: Sent household members to eat elsewhere	327	36	11 [6.2-15.8]	0.9	0.223	1.95 [0.65]-[5.84]	0.995	1 [0.19]-[5.24]	0.361	1.65 [0.55]-[4.94]	0.978	0.99 [0.41]-[2.35]
Past 7 days: Skipped entire days without eating	327	13	4 [0.4-7.5]	2.1	0.162	2.08 [0.73]-[5.92]	.	1 [1.00]-[1.00]	0.265	1.78 [0.63]-[5.04]	0.359	0.63 [0.22]-[1.75]
Past 6 months: Received humanitarian cereal food assistance	321	48	15 [7.1-22.8]	3.1	0.529	0.7 [0.23]-[2.18]	0.987	0.99 [0.33]-[2.96]	0.339	0.59 [0.20]-[1.78]	0.004	2.63 [1.40]-[4.94]
Household had no money or food <30 days	314	59	18.8 [10.9-26.7]	4	0.759	0.86 [0.31]-[2.34]	0.132	2.13 [0.79]-[5.75]	0.755	0.87 [0.35]-[2.18]	0.237	0.6 [0.25]-[1.42]
Past 3 months: Main source of cereal from means other than cash	326	83	25.5 [15.6-35.3]	0	0.512	0.78 [0.36]-[1.69]	0.876	0.92 [0.30]-[2.79]	0.375	0.72 [0.34]-[1.52]	0.127	1.7 [0.85]-[3.39]
Past 3 months: Main source of milk from means other than cash	326	28	8.6 [1.9-15.3]	4.3	0.786	1.15 [0.42]-[3.16]	0.207	1.95 [0.68]-[5.62]	0.957	0.97 [0.36]-[2.65]	0	3.15 [1.82]-[5.43]
WASH: Main source of drinking water unprotected	325	21	6.5 [-0.2-13.1]	1.6	0.163	0.5 [0.19]-[1.34]	0.872	0.87 [0.14]-[5.28]	0.087	0.43 [0.16]-[1.14]	0.603	0.74 [0.23]-[2.36]

WASH: Toilet used by most members of the household	323	5	1.9 [0.8 -3.8]	4	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.529	0.4 [0.02]-[7.72]
Mother has any education	572	30	5.2 [1.4-9]	2.8	0.272	1.54 [0.70]-[3.40]	0.167	2.35 [0.68]-[8.09]	0.511	1.29 [0.59]-[2.81]	0.889	1.08 [0.37]-[3.15]
Mother slept under mosquito net last night	571	512	89.7 [.84.4-93.3]	2.8	0.053	0.57 [0.32]-[1.01]	0.132	0.43 [0.14]-[1.31]	0.094	0.56 [0.28]-[1.11]	0.996	1 [0.47]-[2.12]

Table 23: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2015 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		Stu *Children 6*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	
Male child	712	370	52 [47.9-56]	1.1	0.822	1.03 [0.79]-[1.35]	0.018	0.58 [0.38]-[0.91]	0.534	0.92 [0.70]-[1.21]	0.001	1.7
Main provider female	712	114	16 [11.6-20.4]	2.4	0.385	1.24 [0.76]-[2.03]	0.272	0.65 [0.30]-[1.42]	0.543	1.18 [0.68]-[2.04]	0.675	1.0
Household head female	700	181	25.9 [17.9-33.8]	5.5	0.668	1.07 [0.78]-[1.46]	0.97	1.01 [0.50]-[2.07]	0.442	1.14 [0.80]-[1.63]	0.085	1.5
Age group -<24 months	712	249	35 [32.3-37.7]	0.6	0.208	1.25 [0.88]-[1.79]	0	11.41 [6.64]-[19.62]	0.005	1.71 [1.19]-[2.47]	0.001	2.0
Age group -<36 months	712	296	41.6 [38.4-44.8]	0.72	0.352	1.2 [0.81]-[1.76]	0.352	1.25 [0.88]-[1.79]	0	13.77 [5.13]-[36.9]	0	
Above average household size (> =6 members)	712	373	52.4 [44.5-60.1]	4.3	0.06	1.47 [0.98]-[2.2]	0.052	1.5 [0.1]-[2.3]	0.02	1.5 [1.1]-[2.1]	0.301	1.
Number of children under 5 >1	712	161	22.6 [16.4-28.8]	3.8	0.366	1.19 [0.81]-[1.76]	0.111	1.54 [0.90]-[2.62]	0.171	1.31 [0.89]-[1.93]	0.629	1.1
Household displaced by insecurity	712	434	61 [48.1-73.8]	11.8	0.327	1.23 [0.80]-[1.89]	0.913	0.96 [0.42]-[2.17]	0.45	1.18 [0.76]-[1.81]	0.574	0.8
Household displaced by drought	712	164	23 [15.4-30.6]	5.6	0.212	0.72 [0.42]-[1.22]	0.8	1.08 [0.58]-[2.00]	0.411	0.79 [0.45]-[1.40]	0.502	1.1
Household displaced by eviction	712	15	2.1 [0.4-3.8]	2.4	0.211	1.51 [0.78]-[2.91]	0.669	0.65 [0.09]-[4.95]	0.454	1.27 [0.67]-[2.41]	0.711	0.8
Household displaced by conflict	712	67	9.4 [3.4-15.4]	7.3	0.803	1.09 [0.54]-[2.18]	0.878	1.08 [0.40]-[2.88]	0.827	1.07 [0.56]-[2.06]	0.6	1.2
Household displaced by loss of livelihood	712	18	2.5 [0.7-4.4]	2.4	0.127	2.14 [0.80]-[5.74]	0.007	2.72 [1.34]-[5.51]	0.095	2.3 [0.86]-[6.16]	0.633	0.5
Primary occupation: Casual labour	712	225	31.6 [26.7-36.5]	1.9	0.755	1.07 [0.70]-[1.62]	0.621	1.14 [0.66]-[1.98]	0.804	1.05 [0.69]-[1.60]	0.733	0.9
Primary occupation: self employed	712	28	3.9 [1.4-6.5]	3	0.355	0.67 [0.28]-[1.60]	0.435	1.56 [0.50]-[4.90]	0.447	0.71 [0.29]-[1.74]	0.453	1.3
Primary occupation: petty trade	712	23	3.2 [1-5.4]	2.7	0.211	0.46 [0.14]-[1.58]	0.676	1.39 [0.28]-[6.90]	0.362	0.55 [0.15]-[2.04]	0.779	0.8
Primary occupation: other trade	712	16	2.2 [0.4-4.1]	2.6	0.611	0.74 [0.23]-[2.41]	0.297	2.17 [0.49]-[9.57]	0.887	0.92 [0.27]-[3.16]	0.645	0.7
Low wage (2/3 of mean wage per person per day)	321	218	67.9 [58.7-77.1]	3	0.393	0.79 [0.45]-[1.38]	0.267	0.64 [0.29]-[1.43]	0.631	0.87 [0.49]-[1.54]	0.302	0.
Income from: Petty Trade	320	100	31.3 [23.5-39]	2.1	0.081	1.75 [0.93]-[3.30]	0.262	0.55 [0.19]-[1.60]	0.217	1.44 [0.80]-[2.60]	0.12	0.6
Income from: Casual Labour Wage (Portage, Construction, Etc.)	320	190	59.4 [50.6-68.1]	2.4	0.178	1.35 [0.87]-[2.11]	0.422	1.33 [0.65]-[2.74]	0.284	1.32 [0.79]-[2.21]	0.365	1.3
Income from: Casual Labour Wage (Farm Labour)	320	33	10.3 [4.3-16.3]	3	0.163	0.58 [0.27]-[1.26]	0.994	1 [0.33]-[3.09]	0.195	0.61 [0.29]-[1.30]	0.524	0.7
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	320	116	36.2 [27.9-44.6]	2.3	0.08	0.49 [0.22]-[1.10]	0.843	1.08 [0.48]-[2.43]	0.061	0.5 [0.24]-[1.03]	0.287	1.4
Income from: Skilled/Salary Work	320	19	5.9 [1.6-10.3]	2.6	0.406	0.62 [0.19]-[1.99]	0.376	1.98 [0.42]-[9.35]	0.638	0.75 [0.22]-[2.56]	0.617	0.7
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	320	10	3.1 [-0.8-7.1]	4	.	1 [1.00]-[1.00]	0.834	1.12 [0.38]-[3.30]	0.04	0.29 [0.09]-[0.94]	0.847	0.7
Income from: Humanitarian Assistance (Cash)	320	27	8.4 [2.7-14.2]	3.3	0.911	0.94 [0.33]-[2.71]	0.117	2.55 [0.78]-[8.31]	0.678	1.21 [0.49]-[3.00]	0.337	0.4

Has assets: sheepgoat	317	91	28.8 [18.7-39]	3.9	0.654	1.19 [0.54]-[2.65]	0.676	0.81 [0.29]-[2.26]	0.522	1.28 [0.59]-[2.77]	0.236	0.6
Has assets: donkey	318	65	20.5 [12.8-28.2]	2.8	0.936	0.97 [0.44]-[2.15]	0.976	1.01 [0.44]-[2.31]	0.847	1.07 [0.53]-[2.14]	0.683	0.8
Has assets: chicken	317	112	35.2 [26.6-43.8]	2.5	0.451	0.8 [0.44]-[1.45]	0.39	0.68 [0.27]-[1.68]	0.569	0.84 [0.45]-[1.55]	0.633	0.8
Has assets: land	322	79	24.6 [14.9-34.4]	3.9	0.808	1.08 [0.57]-[2.03]	0.303	0.64 [0.27]-[1.52]	0.842	0.94 [0.52]-[1.71]	0.083	0.4
Has assets: house	315	236	74.8 [65.1-84.6]	3.9	0.618	1.24 [0.52]-[2.91]	0.136	0.51 [0.21]-[1.25]	0.931	0.96 [0.40]-[2.31]	0.319	0.7
Has assets: radio	318	102	32.1 [22.8-41.4]	3	0.393	1.26 [0.73]-[2.17]	0.148	0.55 [0.24]-[1.25]	0.862	1.05 [0.61]-[1.82]	0.001	0.4
Has assets: bike	321	11	3.5 [0.5-6.4]	2	0.513	0.7 [0.24]-[2.08]	0.997	1 [0.17]-[5.71]	0.983	1.01 [0.28]-[3.68]	0.8	1.1
Has assets: phone	315	236	74.8 [66-83.5]	3.1	0.033	0.46 [0.22]-[0.93]	0.004	0.27 [0.12]-[0.65]	0.029	0.43 [0.20]-[0.91]	0.076	0.6
Has assets: agtools	319	21	6.7 [2.6-10.7]	2	0.452	1.44 [0.55]-[3.77]	0.001	4.95 [2.04]-[11.96]	0.126	1.92 [0.82]-[4.47]	0.217	2.1
Has assets: skwtools	315	24	7.5 [2.2-12.9]	3.2	0.26	1.64 [0.68]-[3.96]	0.43	1.48 [0.55]-[4.00]	0.213	1.67 [0.73]-[3.78]	0.916	0.9
Has assets: cart	318	14	4.4 [1.4-7.5]	1.7	0.374	0.55 [0.14]-[2.12]	0.467	1.69 [0.40]-[7.24]	0.73	0.78 [0.18]-[3.43]	0.474	1.4
Has assets: wheelbarrow	321	21	6.6 [1-12.2]	3.8	0.013	2.53 [1.23]-[5.23]	0.076	2.56 [0.90]-[7.26]	0.038	2.59 [1.06]-[6.35]	0.93	0.9
Spends over 80% of earnings on food	321	65	20.2 [11.3-29.2]	3.9	0.27	0.63 [0.27]-[1.46]	0.589	1.28 [0.51]-[3.26]	0.526	0.83 [0.45]-[1.52]	0.876	1.0
Has savings	309	10	3.1 [0.1-6.1]	2.3	0.431	0.45 [0.06]-[3.50]	0.921	1.12 [0.10]-[12.08]	0.345	0.38 [0.05]-[3.00]	0.916	0.88
Received humanitarian cereal food assistance	184	46	24.9 [14.1-35.7]	4.6	0.405	1.45 [0.59]-[3.55]	0.407	1.47 [0.58]-[3.71]	0.58	1.27 [0.54]-[3.00]	0.461	0.7
Household had no money or food <30 days	317	148	46.7 [32.3-61.2]	3.6	0.162	1.57 [0.82]-[2.98]	0.396	1.52 [0.56]-[4.13]	0.244	1.44 [0.77]-[2.71]	0.366	0.7
Purchased cereal means other than cash	317	22	6.9 [0.7-13.2]	4.6	0.704	0.73 [0.14]-[3.90]	0.921	1.08 [0.22]-[5.21]	0.775	0.82 [0.19]-[3.42]	0.467	0.6
Purchased milk means other than cash	712	88	12.3 [3.9-20.7]	5	0.841	1.09 [0.46]-[2.56]	0.676	1.27 [0.41]-[3.96]	0.916	1.05 [0.42]-[2.60]	0.262	0.5
Received Vitamin A in last six months	712	248	34.8 [21-48.6]	14.4	0.252	1.36 [0.80]-[2.31]	0.008	0.39 [0.20]-[0.77]	0.436	1.21 [0.74]-[1.97]	0.631	0.8
Received measles vaccination in last six months	712	273	38.3 [24.7-52]	13.5	0.434	1.22 [0.73]-[2.05]	0.349	0.71 [0.35]-[1.47]	0.358	1.24 [0.77]-[2.00]	0.489	0.8
Received polio vaccination in last six months	712	402	56.5 [47.7-65.2]	5.3	0.773	1.03 [0.85]-[1.24]	0.032	0.7 [0.51]-[0.97]	0.805	0.98 [0.81]-[1.18]	0.826	0.9
Diarrhoea in last 2 weeks	712	57	7.9 [5.0-12.2]	2.9	0.029	2.14 [1.09]-[4.19]	0	4.46 [2.19]-[9.1]	0.038	2.09 [1.05]-[4.16]	0.098	1.7
Pneumonia in last 2 weeks	712	57	6.5 [3.2-12.7]	5.7	0.983	1 [.68]-[1.45]	0	3.23 [1.93]-[5.41]	0.046	1.48 [1.]-[2.18]	0.805	1.0
fever in last 2 weeks	712	101	14.2 [6.3-22.1]	8.9	0.455	0.75 [0.34]-[1.64]	0.515	0.78 [0.36]-[1.69]	0.357	0.73 [0.37]-[1.44]	0.589	1.1
morbidity in last two weeks	712	171	24 [-16 -34.4]	8	0.201	1.4 [.81]-[2.56]	0.001	2.3 [1.4]-[3.8]	0.089	1.5 [.93]-[2.54]	0.889	1
HDD: Cereals in last 24 hr	304	304	100			1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Vitamin A Rich Fruits in last 24 hr	29		0			1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Legumes, Nuts And Seeds in last 24 hr	147		0			1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Any fruit	37		0			1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Any meat			0			1 [1.00]-[1.00]	0.724	1.1 [0.64]-[1.89]	.	1 [1.00]-[1.00]	.	1
Past 7 days: Shifted to less preferred (low quality, less expensive) foods	301	134	44.5 [31.9-57.2]	4.7	0.519	1.29 [0.59]-[2.82]	0.399	0.69 [0.28]-[1.68]	0.34	1.4 [0.69]-[2.85]	0.61	1.2

Past 7 days: Limited the portion/quantity consumed in a meal	307	117	38.1 [25.7-50.5]	4.8	0.564	0.79 [0.36]-[1.77]	0.041	0.41 [0.17]-[0.96]	0.718	0.88 [0.43]-[1.81]	0.816	0.9
Past 7 days: Took fewer numbers of meals in a day	305	82	26.9 [14-39.8]	6.2	0.764	0.88 [0.37]-[2.10]	0.083	0.48 [0.21]-[1.11]	0.815	0.91 [0.40]-[2.05]	0.563	1.2
Past 7 days: Borrowed food on credit from the shop/market	308	155	50.3 [38-62.6]	4.5	0.857	1.06 [0.57]-[1.98]	0.084	0.5 [0.22]-[1.10]	0.954	0.98 [0.52]-[1.87]	0.692	1.1
Past 7 days: Borrowed food on credit from another household (Amaah)?	308	118	38.3 [24.3-52.3]	6.1	0.426	1.35 [0.64]-[2.85]	0.34	0.48 [0.11]-[2.22]	0.701	1.15 [0.55]-[2.42]	0.96	0.9
Past 7 days: Restricted consumption of adults for small children to eat?	307	87	28.3 [15.3-41.4]	6.2	0.895	1.05 [0.50]-[2.18]	0.477	0.59 [0.13]-[2.62]	0.941	0.97 [0.48]-[1.96]	0.956	1.0
Past 7 days: Relied on food donations from relatives	308	39	12.7 [7-18.3]	2.1	0.282	1.62 [0.66]-[4.01]	0.993	0.99 [0.30]-[3.35]	0.339	1.52 [0.63]-[3.68]	0.321	1.5
Past 7 days: Relied on food donations from the clan/community	307	33	10.7 [4-17.5]	3.5	0.337	1.69 [0.56]-[5.05]	0.44	0.42 [0.04]-[4.04]	0.547	1.38 [0.47]-[4.06]	0.567	1.3
Past 7 days: Sought or rely on food aid from humanitarian agency	308	32	10.4 [3.1-17.6]	4.2	0.261	1.78 [0.64]-[4.95]	0	4.93 [3.50]-[6.93]	0.461	1.45 [0.52]-[4.03]	0.493	0.?
Past 7 days: Sent household members to eat elsewhere	309	23	7.4 [3.6-11.3]	1.6	0.908	1.04 [0.49]-[2.23]	0.983	1.02 [0.20]-[5.22]	0.741	1.14 [0.52]-[2.46]	0.364	1.6
Past 7 days: Skipped entire days without eating	309	21	6.8 [3-10.6]	1.7	0.68	1.27 [0.39]-[4.12]	0.037	3.13 [1.08]-[9.10]	0.605	1.34 [0.43]-[4.23]	0.49	0.6
Past 6 months: Received humanitarian cereal food assistance	304	9	2.9 [-1.8-7.7]	5.9	.	1 [1.00]-[1.00]	0.18	1.72 [0.77]-[3.85]	.	1 [1.00]-[1.00]	.	1
Mother has any education	308	40	13.1 [7.3-19]	3	0.854	0.92 [0.36]-[2.32]	0.528	1.37 [0.50]-[3.71]	0.281	1.37 [0.77]-[2.43]	0.104	0.5
Mother slept under mosquito net last night	411	270	65.7 [57.1-74.3]	3.2	0.599	0.85 [0.45]-[1.60]	0.413	1.28 [0.77]-[1.88]	0.668	0.89 [0.51]-[1.55]	0.969	0.9

Table 24: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2016 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		Stun *Children 6*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	
Male child	707	372	52.6 [48.4-56.8]	1.2	0.03	2.02 [1.07]-[3.78]	0.933	0.96 [0.39]-[2.38]	0.03	1.86 [1.07]-[3.25]	0.041	1.4
Age group -<24 months	707	249	35.2 [32.2-38.2]	0.6	0.181	0.71 [0.42]-[1.19]	0	12.67 [4.69]-[34.21]	0.894	0.97 [0.59]-[1.60]	0	2.7
Age group -<36 months	707	414	58.6 [54.9-62.1]	0.9	0.001	0.44 [.29]-[.68]	0.003	21.8 [3.69]-[144.21]	0.03	0.58 [0.36]-[.94]	0	3.8
Above average household size (> =6 members)	707		39.3 [32 -47.2]		0.586	1.12 [0.74]-[1.7]	0.169	0.58 [0.26]-[1.28]	0.939	0.98 [0.67]-[1.46]	0.257	0.7
Number of children under 5 >1	707	169	23.9 [19.2-28.6]	2	0.201	0.62 [0.30]-[1.31]	0.975	1.01 [0.43]-[2.39]	0.154	0.61 [0.31]-[1.21]	0.294	0.82
Household displaced by insecurity	707	386	54.6 [38.5-70.7]	17.5	0.259	1.34 [0.80]-[2.25]	0.398	1.38 [0.64]-[2.97]	0.218	1.39 [0.81]-[2.36]	0.895	1.03
Household displaced by drought	707	247	34.9 [21.5-48.4]	13.3	0.412	0.77 [0.40]-[1.48]	0.038	0.38 [0.15]-[0.94]	0.421	0.78 [0.41]-[1.47]	0.275	1.29
Household displaced by eviction	707	26	3.7 [0.4-7]	5.1	0.601	0.82 [0.37]-[1.80]	0.944	0.93 [0.13]-[6.92]	0.382	0.71 [0.33]-[1.56]	0.057	1.7
Household displaced by conflict	707	136	19.2 [10.6-27.8]	8	0.024	1.55 [1.06]-[2.25]	0.363	1.35 [0.69]-[2.65]	0.07	1.47 [0.97]-[2.24]	0.079	0.53
Household displaced by flood /fire	707	8	1.1 [-0.1-2.3]	2.2	0.852	0.82 [0.09]-[7.22]	.	1 [1.00]-[1.00]	0.757	0.72 [0.08]-[6.31]	0.004	2.8
Household displaced by loss of livelihood	707	147	20.8 [10.5-31]	10.7	0.082	0.6 [0.34]-[1.07]	0.989	0.99 [0.39]-[2.55]	0.188	0.66 [0.34]-[1.25]	0.931	1.02
Household displaced by other reasons	707	5	0.7 [-0.5-1.9]	3.3	0	8.85 [2.99]-[26.15]	.	1 [1.00]-[1.00]	0.001	7.74 [2.64]-[22.70]	.	1
Primary occupation: Casual labour	707	191	27 [21.8-32.2]	2.3	0.168	0.65 [0.35]-[1.21]	0.951	1.03 [0.38]-[2.76]	0.204	0.71 [0.41]-[1.22]	0.134	1.4
Primary occupation: self employed	707	82	11.6 [7.7-15.5]	2.4	0.885	1.07 [0.42]-[2.74]	0.252	1.63 [0.69]-[3.81]	0.744	1.14 [0.51]-[2.54]	0.291	1.34
Primary occupation: petty trade	707	63	8.9 [5.6-12.2]	2.2	0.689	0.86 [0.39]-[1.88]	0.327	0.35 [0.04]-[2.98]	0.67	0.86 [0.42]-[1.75]	0.456	0.69
Primary occupation: other trade	707	9	1.3 [0.2-2.3]	1.4	0.385	1.93 [0.42]-[8.96]	.	1 [1.00]-[1.00]	0.497	1.69 [0.35]-[8.13]	0.06	2.8
Primary occupation: skilled trade	707	20	2.8 [0.7-5]	2.8	0.025	3.25 [1.17]-[9.02]	0.263	2.72 [0.45]-[16.33]	0.043	2.83 [1.04]-[7.72]	0.076	2.19
Low wage (2/3 of mean wage per person per day)	301	261	86.7 [79-94.4]	3.7	0.649	0.82 [0.33]-[2.02]	0.464	0.54 [0.10]-[2.94]	0.577	0.8 [0.35]-[1.82]	0.424	0.7
Income from: Livestock Sale (Sheep/Goat)	321	7	2.2 [-0.5-4.9]	2.5	0.985	1.02 [0.08]-[13.15]	.	1 [1.00]-[1.00]	0.917	0.88 [0.07]-[11.21]	.	1
Income from: Petty Trade	321	70	21.8 [14.7-29]	2.3	0.82	0.92 [0.44]-[1.94]	0.178	0.27 [0.04]-[1.90]	0.725	0.89 [0.45]-[1.76]	0.141	0.52
Income from: Casual Labour Wage (Portage, Construction, Etc.)	321	156	48.6 [37.5-59.7]	3.8	0.402	0.7 [0.30]-[1.64]	0.463	1.43 [0.53]-[3.86]	0.567	0.81 [0.38]-[1.71]	0.532	1.2
Income from: Casual Labour Wage (Farm Labour)	321	33	10.3 [3.3-17.3]	4.1	0.729	0.83 [0.28]-[2.46]	0.676	0.66 [0.09]-[4.93]	0.872	0.94 [0.41]-[2.15]	0.598	1.3
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	321	103	32.1 [22.4-41.8]	3.3	0.768	0.88 [0.37]-[2.09]	0.291	1.62 [0.65]-[4.08]	0.786	0.9 [0.42]-[1.94]	0.938	0.98
Income from: Skilled/Salary Work	321	16	5 [1.1-8.9]	2.5	0.262	2.15 [0.55]-[8.47]	0.173	3.49 [0.56]-[21.79]	0.378	1.83 [0.46]-[7.26]	0.18	1.98
Income from: Remittance	321	10	3.1 [0.5-5.7]	1.7	0.696	1.56 [0.16]-[15.67]	.	1 [1.00]-[1.00]	0.799	1.33 [0.13]-[13.31]	0.939	0.95

	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	OR
Has assets: any animals	321	10	3.1 [-0.7-6.9]	3.6	0.534	1.56 [0.37]-[6.63]	.	1 [1.00]-[1.00]	0.656	1.33 [0.36]-[4.94]	0.939	0.95
Has assets: sheepgoat	321	119	37.1 [23.6-50.5]	5.9	0.94	0.97 [0.44]-[2.13]	0.9	0.94 [0.35]-[2.54]	0.885	0.95 [0.48]-[1.88]	0.443	1.23
Has assets: donkey	321	80	25 [15.8-34.2]	3.4	0.975	0.99 [0.38]-[2.57]	0.726	0.81 [0.24]-[2.73]	0.914	1.05 [0.43]-[2.56]	0.328	0.73
Has assets: chicken	321	107	33.3 [20.3-46.3]	5.8	0.236	1.63 [0.71]-[3.71]	0.335	0.53 [0.14]-[1.99]	0.402	1.4 [0.62]-[3.18]	0.747	0.89
Has assets: land	321	82	25.7 [13.3-38.1]	6.1	0.856	0.92 [0.38]-[2.22]	0.718	0.78 [0.19]-[3.15]	0.966	0.98 [0.43]-[2.23]	0.003	1.77
Has assets: house	321	260	81 [71.8-90.2]	4.2	0.996	1 [0.41]-[2.43]	0.173	0.4 [0.11]-[1.53]	0.976	1.01 [0.45]-[2.28]	0.422	0.76
Has assets: radio	320	148	46.1 [33.4-58.8]	4.9	0.219	1.5 [0.77]-[2.91]	0.72	1.18 [0.47]-[2.97]	0.196	1.47 [0.81]-[2.69]	0.539	0.83
Has assets: bike	321	30	9.3 [2.8-15.9]	3.8	0.265	0.41 [0.08]-[2.04]	0.098	2.83 [0.82]-[9.80]	0.675	0.8 [0.26]-[2.41]	0.676	1.18
Has assets: phone	319	222	69.5 [60.8-78.1]	2.7	0.538	1.31 [0.54]-[3.17]	0.324	0.57 [0.18]-[1.79]	0.813	1.1 [0.49]-[2.45]	0.025	0.55
Has assets: agtools	321	41	12.8 [4.9-20.6]	4.2	0.897	1.06 [0.42]-[2.66]	0.808	1.15 [0.37]-[3.55]	0.803	1.1 [0.50]-[2.41]	0.946	0.98
Has assets: skwtools	321	26	8.1 [2.6-13.6]	3.1	0.255	0.49 [0.14]-[1.73]	0.9	0.87 [0.09]-[8.69]	0.445	0.67 [0.23]-[1.94]	0.45	1.45
Has assets: cart	321	36	11.2 [5.8-16.6]	2.2	0.1	1.7 [0.90]-[3.23]	0.704	1.34 [0.28]-[6.33]	0.256	1.43 [0.76]-[2.69]	0.888	0.94
Spends over 80% of earnings on food	304	52	17.1 [7.8-26.5]	4.4	0.237	0.51 [0.16]-[1.60]	0.265	0.36 [0.06]-[2.27]	0.332	0.56 [0.17]-[1.87]	0.18	0.55
Received humanitarian cereal food assistance	317	167	52.7 [37.6-67.8]	6.9	0.775	0.88 [0.36]-[2.18]	0.758	1.21 [0.35]-[4.19]	0.934	0.97 [0.41]-[2.28]	0.685	1.17
Household had no money or food <30 days	294	124	42.2 [29.4-55]	4.7	0.289	1.48 [0.70]-[3.14]	0.504	0.75 [0.32]-[1.78]	0.353	1.36 [0.70]-[2.63]	0.118	0.59
Received polio vaccination in last six months	697	408	58.5 [45.9-71.2]	11	0.255	0.88 [0.71]-[1.10]	0.307	0.79 [0.50]-[1.25]	0.252	0.89 [0.73]-[1.09]	0.248	1.13
Diarrhoea in last 2 weeks	697	17	2.4 [0.9-3.9]	1.5	0.01	4.24 [1.46]-[12.33]	0	28.32 [11.20]-[71.58]	0.001	7.8 [2.54]-[23.95]	0.029	4.23
Pneumonia in last 2 weeks	707	17	2.4 [0.9-3.9]	1.5	0.01	4.24 [1.46]-[12.33]	0	28.32 [11.20]-[71.58]	0.001	7.8 [2.54]-[23.95]	0.029	4.23
fever in last 2 weeks	707	21	3 [0.8-5.2]	2.8	0.026	3.01 [1.15]-[7.85]	0	11.53 [4.58]-[29.02]	0.012	4.02 [1.40]-[11.56]	0.269	1.97
measles in last 2 weeks	707	6	0.8 [0-1.7]	1.6	0.003	1.31 [1.10]-[1.56]	0	1.57 [1.30]-[1.88]	0.165	2.66 [0.65]-[10.87]	0.431	0.87
morbidity in last two weeks	707	33	4.7 [2-7.3]	2.6	0.02	2.66 [1.18]-[6.01]	0	12.26 [5.36]-[28.04]	0.002	3.57 [1.68]-[7.60]	0.018	3.0
HDD: Cereals in last 24 hr	707	317	44.8 [40.4-49.3]	1.3	0.732	0.91 [0.51]-[1.61]	0.747	1.16 [0.47]-[2.86]	0.808	0.94 [0.56]-[1.57]	0.113	1.44
HDD: White Roots And Tubers in last 24 hr	707	59	8.3 [2.8-13.9]	6.9	0.937	0.95 [0.29]-[3.18]	0.423	1.81 [0.41]-[8.11]	0.824	1.11 [0.44]-[2.76]	0.635	0.84
HDD: Vitamin A Rich Vegetables in last 24 hr	707	26	3.7 [0.1-7.3]	6.1	0.189	2.2 [0.66]-[7.30]	.	1 [1.00]-[1.00]	0.272	1.91 [0.58]-[6.28]	0.326	1.75
HDD: Dark Green Leafy Vegetables in last 24 hr	707	12	1.7 [0.3-3.1]	2	0.663	0.64 [0.08]-[5.27]	.	1 [1.00]-[1.00]	0.575	0.56 [0.07]-[4.63]	0.34	0.42
HDD: Other Vegetables in last 24 hr	707	132	18.7 [12-25.4]	5	0.379	1.38 [0.66]-[2.87]	0.412	1.41 [0.61]-[3.27]	0.305	1.4 [0.72]-[2.73]	0.203	1.45
HDD: Vitamin A Rich Fruits in last 24 hr	707	13	1.8 [-0.5-4.1]	4.9	0.36	1.75 [0.51]-[5.95]	.	1 [1.00]-[1.00]	0.486	1.53 [0.45]-[5.22]	.	1
HDD: Other Fruits in last 24 hr	707	28	4 [0.1-7.8]	6.4	0.268	2.09 [0.55]-[7.92]	.	1 [1.00]-[1.00]	0.362	1.81 [0.49]-[6.79]	0.987	1.01
HDD: Organ Meat in last 24 hr	707	25	3.5 [0.8-6.3]	3.7	0.084	3.03 [0.85]-[10.78]	0.979	0.97 [0.12]-[7.89]	0.125	2.64 [0.75]-[9.25]	0.312	1.85
HDD: Flesh Meats in last 24 hr	707	45	6.4 [0.9-11.8]	8.5	0.423	1.52 [0.53]-[4.41]	0.529	0.51 [0.06]-[4.36]	0.59	1.32 [0.46]-[3.78]	1	1

HDD: Eggs in last 24 hr	707	1 [1.00]-[1.00]	1 [1.00]-[1.00]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Fish And Seafood in last 24 hr	707	1 [1.00]-[1.00]	1 [1.00]-[1.00]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Legumes, Nuts And Seeds in last 24 hr	707	232	32.8 [26.4-39.2]	3.1	0.239	0.7 [0.38]-[1.29]	0.675	0.77 [0.22]-[2.70]	0.26	0.72 [0.41]-[1.29]	0.947	0.98
HDD: Milk And Milk Products	707	232	32.8 [26.1-39.5]	3.4	0.891	0.96 [0.52]-[1.76]	0.399	1.47 [0.58]-[3.70]	0.962	1.01 [0.59]-[1.74]	0.541	1.14
HDD: Oils And Fats	707	312	44.1 [39.9-48.3]	1.2	0.602	0.86 [0.47]-[1.57]	0.697	1.19 [0.48]-[2.95]	0.677	0.89 [0.52]-[1.54]	0.135	1.42
HDD: Sweets	707	310	43.8 [39.2-48.5]	1.4	0.394	0.79 [0.45]-[1.38]	0.678	1.2 [0.48]-[2.99]	0.469	0.83 [0.50]-[1.39]	0.086	1.5
HDD: Spices, Condiments, Beverages	707	258	36.5 [29.9-43.1]	3.1	0.381	0.76 [0.40]-[1.44]	0.274	1.66 [0.65]-[4.21]	0.54	0.84 [0.47]-[1.50]	0.168	1.35
HDD: Any veg	707	150	21.2 [13.9-28.5]	5.4	0.536	1.23 [0.62]-[2.46]	0.689	1.19 [0.49]-[2.88]	0.482	1.25 [0.66]-[2.35]	0.226	1.39
HDD: Any fruit	707	33	4.7 [0.4-9]	6.9	0.257	1.99 [0.59]-[6.77]	.	1 [1.00]-[1.00]	0.359	1.73 [0.52]-[5.80]	0.593	0.82
HDD: Any meat	707	49	6.9 [1.4-12.4]	7.8	0.25	1.79 [0.65]-[4.97]	0.463	0.47 [0.06]-[3.78]	0.377	1.55 [0.57]-[4.24]	0.502	1.37
HDD: Four+ food groups in last 7 days	707	311	44 [39.4-48.6]	1.5	0.592	0.86 [0.49]-[1.52]	0.691	1.2 [0.48]-[3.01]	0.675	0.9 [0.54]-[1.50]	0.126	1.43
HDD: Four+ food groups in last 7 dayless than mean score	707	391	55.3 [50.8-59.8]	1.3	0.509	1.2 [0.68]-[2.11]	0.739	0.86 [0.35]-[2.15]	0.574	1.15 [0.69]-[1.90]	0.124	0.7
Past 7 days: Shifted to less preferred (low quality, less expensive) foods	188	124	66 [49.7-82.2]	5.2	0.339	1.65 [0.57]-[4.78]	0.258	3.77 [0.36]-[39.79]	0.341	1.67 [0.56]-[4.97]	0.455	1.39
Past 7 days: Limited the portion/quantity consumed in a meal	183	109	59.6 [42.7-76.4]	5.1	0.898	0.91 [0.21]-[3.93]	0.799	0.84 [0.21]-[3.33]	0.798	0.86 [0.27]-[2.80]	0.472	0.78
Past 7 days: Took fewer numbers of meals in a day	172	81	47.1 [26.2-68]	7.1	0.42	0.58 [0.15]-[2.26]	0.35	0.54 [0.15]-[2.03]	0.274	0.53 [0.16]-[1.71]	0.911	0.9
Past 7 days: Borrowed food on credit from the shop/market	195	105	53.8 [34-73.7]	7.3	0.411	0.62 [0.19]-[2.00]	0.492	0.67 [0.21]-[2.16]	0.396	0.64 [0.23]-[1.84]	0.177	0.62
Past 7 days: Borrowed food on credit from another household (Amaah)?	196	99	50.5 [34.1-66.9]	5	0.705	0.81 [0.26]-[2.55]	0.557	1.5 [0.37]-[6.09]	0.961	0.98 [0.36]-[2.68]	0.113	0.56
Past 7 days: Restricted consumption of adults for small children to eat?	197	47	23.9 [12.4-35.3]	3.4	0.512	1.39 [0.50]-[3.88]	0.07	3.45 [0.90]-[13.30]	0.245	1.66 [0.69]-[4.01]	0.757	0.89
Past 7 days: Relied on food donations from relatives	197	71	36 [20-52]	5.2	0.215	0.54 [0.20]-[1.46]	0.297	0.43 [0.08]-[2.20]	0.31	0.66 [0.29]-[1.50]	0.222	0.66
Past 7 days: Relied on food donations from the clan/community	197	36	18.3 [7.8-28.7]	3.4	0.12	0.17 [0.02]-[1.64]	0.513	0.48 [0.05]-[4.61]	0.084	0.14 [0.01]-[1.32]	0.041	0.46
Past 7 days: Sought or rely on food aid from humanitarian agency	196	14	7.1 [1.8-12.5]	2	0.816	1.2 [0.25]-[5.74]	0.144	3.63 [0.63]-[20.97]	0.441	1.69 [0.43]-[6.70]	0.834	0.86
WASH: Main source of drinking water unprotected	348	148	42.5 [24.8-60.3]	10.6	0.204	1.71 [0.73]-[3.96]	0.858	0.9 [0.26]-[3.08]	0.269	1.49 [0.72]-[3.06]	0.842	1.07
WASH: Toilet used by most members of the household	348	45	12.9 [1.5-24.4]	9.6	0.45	1.61 [0.45]-[5.79]	0.967	1.04 [0.17]-[6.48]	0.644	1.34 [0.37]-[4.83]	0.388	1.39

Table 25: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2017 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		Stu *Children 6*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	
Male child	578	286	49.5 [45.2-53.7]	1	0.853	0.97 [0.66]-[1.41]	0.733	0.85 [0.32]-[2.26]	0.738	0.94 [0.65]-[1.35]	0.307	1.2
Main provider female	691	205	29.7 [24-35.4]	2.6	0.751	1.09 [0.62]-[1.92]	0.009	6.49 [1.65]-[25.51]	0.436	1.22 [0.72]-[2.07]	0.791	0.9
Household head female	615	188	30.6 [24-37.2]	3	0.772	0.92 [0.53]-[1.62]	0.043	4.65 [1.05]-[20.47]	0.932	0.98 [0.57]-[1.68]	0.628	1.1
Age group -<24 months	578	197	34.1 [29.2-38.9]	1.4	0.013	0.43 [0.22]-[0.82]	0.03	5.33 [1.19]-[23.95]	0.058	0.54 [0.29]-[1.02]	0.126	1.3
Age group -<36 months	578	430	58.8 [54.5 - 63]	1.8	0	.23 [0.14]-[.33]	0	3.6 [1.7]-[6.4]	0.016	0.58 [0.38]-[.90]	0	2.
Number of children under 5 >1	726	124	17.1 [12.4-21.7]	2.6	0.905	0.97 [0.54]-[1.73]	0.35	0.36 [0.04]-[3.26]	0.66	0.88 [0.50]-[1.57]	0.966	0.9
Household displaced by insecurity	726	109	15 [10.6-19.4]	2.6	0.846	1.06 [0.59]-[1.91]	0.638	0.64 [0.09]-[4.47]	0.733	1.1 [0.64]-[1.89]	0.061	0.6
Household displaced by drought	726	370	51 [45.6-56.4]	2	0.394	1.28 [0.71]-[2.32]	0.111	0.26 [0.05]-[1.39]	0.693	1.11 [0.64]-[1.94]	0.001	0.5
Household displaced by conflict	726	8	1.1 [-0.1-2.3]	2.4	0.89	0.88 [0.15]-[5.36]	.	1 [1.00]-[1.00]	0.826	0.82 [0.14]-[5.00]	0.967	0.9
Household displaced by flood /fire	726	5	0.7 [-0.1-1.5]	1.7	0.66	1.56 [0.20]-[12.03]	.	1 [1.00]-[1.00]	0.712	1.45 [0.19]-[11.11]	0.167	2.9
Household displaced by loss of livelihood	726	34	4.7 [2.1-7.3]	2.6	0.447	0.58 [0.14]-[2.46]	.	1 [1.00]-[1.00]	0.379	0.54 [0.13]-[2.23]	0.706	1.2
Household displaced by other reasons	726	5	0.7 [0-1.4]	1.3	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.18	5.82
Primary occupation: Casual labor	726	352	48.5 [46.1-50.9]	0.4	0.85	0.96 [0.62]-[1.48]	0.959	0.97 [0.29]-[3.22]	0.792	0.95 [0.62]-[1.44]	0.365	0.8
Primary occupation: self employed	726	352	48.5 [46.1-50.9]	0.4	0.85	0.96 [0.62]-[1.48]	0.959	0.97 [0.29]-[3.22]	0.792	0.95 [0.62]-[1.44]	0.365	0.8
Primary occupation: petty trade	726	352	48.5 [46.1-50.9]	0.4	0.85	0.96 [0.62]-[1.48]	0.959	0.97 [0.29]-[3.22]	0.792	0.95 [0.62]-[1.44]	0.365	0.8
Primary occupation: other trade	337	163	48.5 [46.1-50.9]	0.4	0.85	0.96 [0.62]-[1.48]	0.959	0.97 [0.29]-[3.22]	0.792	0.95 [0.62]-[1.44]	0.365	0.8
Primary occupation: skilled trade	352	171	48.5 [46.1-50.9]	0.4	0.85	0.96 [0.62]-[1.48]	0.959	0.97 [0.29]-[3.22]	0.792	0.95 [0.62]-[1.44]	0.365	0.8
Low wage (2/3 of mean wage per person per day)	352	187	53.1 [42.4-63.8]	3.7	0.011	0.34 [0.15]-[0.77]	.	1 [1.00]-[1.00]	0.019	0.42 [0.20]-[0.86]	0.19	1.6
Income from: Petty Trade	352	60	17 [10.5-23.5]	2.5	0.699	0.81 [0.26]-[2.49]	0.186	3.49 [0.53]-[23.11]	0.932	0.96 [0.34]-[2.70]	0.118	1.6
Income from: Casual Labour Wage (Portage, Construction, Etc.)	352	166	47.2 [38.6-55.7]	2.4	0.899	0.96 [0.46]-[1.99]	0.196	4.66 [0.43]-[50.46]	0.919	0.97 [0.48]-[1.94]	0.075	1.7
Income from: Casual Labour Wage (Farm Labour)	352	24	6.8 [3.7-9.9]	1.3	0.386	0.44 [0.06]-[3.01]	.	1 [1.00]-[1.00]	0.35	0.41 [0.06]-[2.82]	0.511	0.4
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	352	102	29 [19-38.9]	4	0.41	1.29 [0.69]-[2.40]	.	1 [1.00]-[1.00]	0.591	1.17 [0.65]-[2.12]	0.094	0.5
Income from: Skilled/Salary Work	352	9	2.6 [-0.2-5.3]	2.5	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	352	14	4 [1.7-6.3]	1.2	0.208	2.63 [0.57]-[12.23]	.	1 [1.00]-[1.00]	0.237	2.46 [0.53]-[11.30]	0.913	1.0
Income from: Humanitarian Assistance (Cash)	352	96	27.3 [14.4-40.2]	7	0.029	1.89 [1.07]-[3.32]	.	1 [1.00]-[1.00]	0.045	1.7 [1.01]-[2.85]	0.493	0.7

Variable	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	
Has assets: any animals	352	90	25.6 [14-37.1]	5.8	0.642	0.82 [0.34]-[1.96]	0.484	1.86 [0.31]-[11.32]	0.497	0.75 [0.32]-[1.76]	0.068	0.4
Has assets: sheepgoat	352	79	22.4 [11.7-33.2]	5.6	0.962	1.02 [0.45]-[2.32]	0.386	2.24 [0.34]-[14.77]	0.87	0.94 [0.42]-[2.08]	0.071	0.4
Has assets: donkey	352	61	17.3 [9.3-25.4]	3.8	0.554	1.31 [0.52]-[3.28]	.	1 [1.00]-[1.00]	0.674	1.2 [0.49]-[2.95]	0.151	0.4
Has assets: chicken	352	39	11.1 [4.9-17.3]	3.2	0.896	0.93 [0.31]-[2.80]	.	1 [1.00]-[1.00]	0.788	0.87 [0.29]-[2.55]	0.717	1.2
Has assets: land	352	94	26.7 [10.3-43.1]	11.5	0.002	0.21 [0.08]-[0.54]	0.142	4.04 [0.61]-[26.76]	0.006	0.28 [0.11]-[0.67]	0.34	0.6
Has assets: house	352	315	89.5 [80.2-98.8]	7.7	0.907	0.94 [0.32]-[2.78]	0.447	0.48 [0.07]-[3.39]	0.358	0.75 [0.39]-[1.42]	0.82	0.9
Has assets: radio	351	48	13.6 [6.3-21]	3.8	0.284	1.71 [0.63]-[4.66]	0.589	1.86 [0.18]-[19.27]	0.347	1.58 [0.59]-[4.22]	0.775	1.1
Has assets: bike	352	7	2 [-0.1-4.1]	1.9	0.957	1.06 [0.12]-[9.29]	.	1 [1.00]-[1.00]	0.993	0.99 [0.11]-[8.73]	0.587	0.5
Has assets: phone	352	286	81.2 [74.3-88]	2.6	0.237	1.76 [0.68]-[4.56]	0.89	0.85 [0.08]-[9.04]	0.426	1.42 [0.58]-[3.48]	0.302	1.4
Has assets: agtools	352	15	4.3 [0-8.5]	3.6	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Has assets: skwtools	352	24	6.8 [-1-14.6]	7.9	0.001	2.48 [1.49]-[4.11]	.	1 [1.00]-[1.00]	0.001	2.3 [1.43]-[3.70]	0.097	0.2
Has assets: cart	352	52	14.8 [6.8-22.7]	4.2	0.529	1.34 [0.53]-[3.39]	.	1 [1.00]-[1.00]	0.64	1.23 [0.50]-[3.07]	0.214	0.5
Spends over 80% of earnings on food	726	76	10.5 [3.8-17.2]	4	0.033	2.16 [1.07]-[4.38]	.	1 [1.00]-[1.00]	0.048	2 [1.01]-[3.97]	0.531	1.1
Received humanitarian cereal food assistance	726	225	31 [29-33]	0.3	0.935	0.98 [0.59]-[1.64]	0.251	0.28 [0.03]-[2.61]	0.655	0.89 [0.52]-[1.52]	0.104	0.6
Received humanitarian cash assistance	577	133	23 [18.7-27.3]	1.8	0.966	1.01 [0.51]-[2.01]	0.42	0.42 [0.05]-[3.75]	0.828	0.93 [0.46]-[1.86]	0.127	0.6
Received polio vaccination in last six months	577	198	34.4 [25.9-43]	4.5	0.319	0.91 [0.76]-[1.10]	0.224	0.7 [0.38]-[1.27]	0.209	0.89 [0.74]-[1.07]	0.573	1.0
Diarrhoea in last 2 weeks	578	31	5.4 [2.7-8.1]	2	0.927	0.95 [0.30]-[2.97]	0.001	17.31 [3.68]-[81.32]	0.486	1.47 [0.48]-[4.55]	0.669	1.1
Pneumonia in last 2 weeks	578	31	5.4 [2.7-8.1]	2	0.927	0.95 [0.30]-[2.97]	0.001	17.31 [3.68]-[81.32]	0.486	1.47 [0.48]-[4.55]	0.669	1.1
fever in last 2 weeks	577	25	4.3 [2-6.6]	1.7	0.087	2.16 [0.89]-[5.24]	0	14.86 [4.26]-[51.79]	0.041	2.5 [1.04]-[6.02]	0.106	0.4
morbidity in last two weeks	352	29	8.3 [4.9-11.8]	2.2	0.828	1.09 [0.48]-[2.49]	0	14.97 [3.97]-[56.43]	0.263	1.63 [0.68]-[3.94]	0.65	0.8
HDD: White Roots And Tubers in last 24 hr	352	329	93.5 [89.7-97.2]	1.9	0.342	0.61 [0.21]-[1.74]	.	1 [1.00]-[1.00]	0.408	0.65 [0.23]-[1.84]	0.295	0.6
HDD: Vitamin A Rich Vegetables in last 24 hr	352	349	99.1 [98.2-100.1]	0.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Dark Green Leafy Vegetables in last 24 hr	352	347	98.6 [96.9-100.3]	1.7	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.945	0.94
HDD: Other Vegetables in last 24 hr	352	128	36.4 [26.5-46.2]	3.5	0.062	0.4 [0.15]-[1.05]	0.825	1.21 [0.21]-[7.08]	0.063	0.44 [0.18]-[1.05]	0.787	0.9
HDD: Vitamin A Rich Fruits in last 24 hr	352	351	99.7 [99.1-100.3]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
HDD: Organ Meat in last 24 hr	352	350	99.4 [98.3-100.6]	2	0	0.15 [0.11]-[0.22]	.	1 [1.00]-[1.00]	0	0.16 [0.12]-[0.23]	0	0.3
HDD: Flesh Meats in last 24 hr	352	333	94.6 [90.4-98.8]	2.8	0.096	0.37 [0.11]-[1.21]	0.188	0.21 [0.02]-[2.25]	0.116	0.39 [0.12]-[1.28]	0.326	0.54
HDD: Legumes, Nuts And Seeds in last 24 hr	352	162	46 [35.3-56.8]	3.9	0.289	0.69 [0.34]-[1.39]	0.738	0.73 [0.11]-[4.92]	0.483	0.8 [0.43]-[1.51]	0.862	0.9
HDD: Milk And Milk Products	352	136	38.6 [24.5-52.8]	7.1	0.105	1.74 [0.88]-[3.44]	0.888	1.13 [0.19]-[6.94]	0.078	1.76 [0.93]-[3.31]	0.476	0.8
HDD: Oils And Fats	352	9	2.6 [0.5-4.6]	1.4	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.92	1.0
HDD: Sweets	352	75	21.3 [10.9-31.7]	5.4	0.205	0.57 [0.24]-[1.38]	0.31	2.45 [0.41]-[14.50]	0.314	0.68 [0.31]-[1.48]	0.746	0.8
HDD: Spices, Condiments, Beverages	352	7	2 [-0.3-4.3]	2.3	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.653	0.6

HDD: Any meat	352	350	99.4 [98.3-100.6]	2	0	0.15 [0.11]-[0.22]	.	1 [1.00]-[1.00]	0	0.16 [0.12]-[0.23]	0	0.3
HDD: Four+ food groups in last 7 days	726	352	48.5 [46.1-50.9]	0.4	0.85	0.96 [0.62]-[1.48]	0.959	0.97 [0.29]-[3.22]	0.792	0.95 [0.62]-[1.44]	0.365	0.8
HDD: Four+ food groups in last 7 dayless than mean score	726	374	51.5 [49.1-53.9]	0.4	0.85	1.04 [0.68]-[1.60]	0.959	1.03 [0.31]-[3.42]	0.792	1.06 [0.69]-[1.61]	0.365	1.2

Table 26: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2018 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 0-59 months*		Wasting (MUAC) *Children 6-59 months[1]*		Wasting by MUAC and/or W *Children 6-59 months*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Male child	710	336	47.3 [42.5-52.1]	1.5	0.961	1.01 [0.59]-[1.73]	0.525	0.84 [0.48]-[1.46]	0.521	0.86 [0.54]-[1.37]
Age group -<24 months	710	221	31.1 [28.5-33.8]	0.6	0.618	0.84 [0.41]-[1.71]	0	9.08 [3.69]-[22.35]	0.274	1.43 [0.74]-[2.77]
Age group -<36 months	710	404	56.9 [53.9-60.8]	1.1						
Received Vitamin A in last six months	710	141	19.9 [10.2-29.5]	9.9	0.025	0.52 [0.30]-[0.92]	0.08	0.47 [0.20]-[1.10]	0.057	0.57 [0.32]-[1.02]
Received measles vaccination in last six months	710	184	25.9 [16.3-35.5]	8.1	0.807	0.94 [0.54]-[1.63]	0.858	1.06 [0.54]-[2.11]	0.847	1.05 [0.61]-[1.81]
Received polio vaccination in last six months	710	685	96.5 [94.3-98.7]	2.3	0.202	3.62 [0.48]-[27.16]	.	1 [1.00]-[1.00]	0.139	4.39 [0.60]-[32.15]
Diarrhea in last 2 weeks	710	5	0.7 [0-1.4]	1.2	0.665	1.72 [0.14]-[21.62]	.	1 [1.00]-[1.00]	0.78	1.41 [0.11]-[17.46]
Pneumonia in last 2 weeks	710	5	0.7 [0-1.4]	1.2	0.665	1.72 [0.14]-[21.62]	.	1 [1.00]-[1.00]	0.78	1.41 [0.11]-[17.46]
fever in last 2 weeks	710	12	1.7 [0.1-3.2]	2.4	0.292	2.32 [0.46]-[11.61]	0.041	6.51 [1.09]-[38.88]	0.427	1.91 [0.37]-[9.81]
measles in last 2 weeks	710	4	0.6 [.11-2.8]	2.5	.	1 [1.00]-[1.00]	0.001	6.2 [2.21]-[17.44]	0.225	1.89 [0.66]-[5.39]
morbidity in last two weeks	710	21	3 [1.5-5.6]	2.2	0.358	1.64 [0.56]-[4.81]	0.023	4.68 [1.26]-[17.30]	0.211	1.8 [0.70]-[4.62]
WASH: Toilet used by most members of the household	199	5	2.5 [0.3-17.3]	5.1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]

Table 27: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2019 (FSNAU)

Risk factor	N	n	Proportion in analyzed sample [95% CI]	Design effect	Wasting (W/H)		Wasting (MUAC)		Wasting by MUAC and/or W/H		S	
Logistic Regression					*Children 0-59 months*		*Children 6-59 months[1]*		*Children 6-59 months*		*Children*	
Indicator					P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	
Male child	599	295	49.2 [44.2-54.3]	1.4	0.564	1.14 [0.72]-[1.81]	0.286	0.62 [0.25]-[1.52]	0.927	1.02 [0.65]-[1.61]	0.44	1
Main provider female	579	96	16.6 [11.4-21.8]	2.7	0.514	0.83 [0.47]-[1.48]	0.791	0.89 [0.37]-[2.13]	0.679	0.89 [0.51]-[1.56]	0.063	0
Household head female	511	127	24.9 [17.2-32.5]	3.8	0.991	1 [0.58]-[1.74]	0.24	0.64 [0.30]-[1.37]	0.709	1.1 [0.66]-[1.84]	0.007	0
Age group -<24 months	599	225	37.6 [34.1-41]	0.7	0.458	0.82 [0.49]-[1.40]	0	14.23 [4.90]-[41.31]	0.244	1.34 [0.81]-[2.24]	0.012	1
Age group -<36 months	599	377	62.3 [59.3-65.1]	0.5	0.006	0.54 [0.35]-[.82]	1 predicts failure perfectly		0.292	.78 [0.49]-[1.25]	0.001	2
Above average household size (> =6 members)	590	246	41.2 [34.9-47.9]	2.5	0.237	1.25 [.85] - [1.82]	0.377	0.76 [0.41]-[1.41]	0.942	1.01 [.70]-[1.46]	0.594	1
Number of children under 5 >1	599	159	26.5 [21.5-31.6]	1.8	0.413	0.85 [0.57]-[1.27]	0.991	1 [0.47]-[2.11]	0.288	0.8 [0.53]-[1.22]	0.63	1
Household displaced by insecurity	599	150	25 [18.7-31.4]	3	0.993	1 [0.55]-[1.80]	0.833	0.92 [0.40]-[2.12]	0.992	1 [0.58]-[1.70]	0.005	0
Household displaced by drought	599	402	67.1 [58.1-76.1]	5.2	0.684	0.92 [0.60]-[1.41]	0.464	1.39 [0.56]-[3.41]	0.544	0.89 [0.61]-[1.31]	0.045	1
Household displaced by eviction	599	3	0.5 [-0.2-1.2]	1.6	0.002	12.24 [2.62]-[57.20]	.	1 [1.00]-[1.00]	0.004	9.92 [2.22]-[44.36]	.	
Household displaced by conflict	599	34	5.7 [1.8-9.5]	3.9	0.893	1.07 [0.37]-[3.14]	0.419	0.49 [0.08]-[2.93]	0.844	1.09 [0.46]-[2.59]	0.167	1
Household displaced by flood /fire	599	6	1 [-0.1-2.1]	1.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0	2
Household displaced by loss of livelihood	599	24	4 [1-7]	3.4	0.86	0.85 [0.13]-[5.55]	0.761	0.71 [0.08]-[6.79]	0.969	0.97 [0.23]-[4.19]	0.172	0
Household displaced by other reasons	599	3	0.5 [-0.5-1.5]	3	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.013	1
Primary occupation: Casual labor	599	190	31.7 [26.6-36.8]	1.7	0.347	0.81 [0.52]-[1.27]	0.38	1.36 [0.67]-[2.74]	0.485	0.88 [0.60]-[1.29]	0.141	1
Primary occupation: self employed	599	54	9 [5.9-12.1]	1.7	0.412	0.61 [0.18]-[2.04]	0.96	0.98 [0.35]-[2.70]	0.218	0.49 [0.16]-[1.56]	0.283	1
Primary occupation: petty trade	599	33	5.5 [2.8-8.2]	2	0.392	0.41 [0.05]-[3.32]	.	1 [1.00]-[1.00]	0.291	0.33 [0.04]-[2.70]	0.368	0
Primary occupation: other trade	599	599	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Primary occupation: skilled trade	599	16	2.7 [1-4.4]	1.5	0.168	2.24 [0.70]-[7.17]	0.049	4.11 [1.01]-[16.72]	0.298	1.8 [0.58]-[5.63]	0.288	0
Low wage (2/3 of mean wage per person per day)	261	91	34.9 [24.5-45.2]	2.9	0.667	0.83 [0.36]-[1.96]	0.807	0.85 [0.23]-[3.21]	0.504	0.74 [0.29]-[1.86]	0.614	0
Income from: Sales Of Camel And Cattle	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Livestock Sale (Sheep/Goat)	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Crop Sale	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Petty Trade	261	38	14.6 [8.1-21]	2.1	0.296	0.34 [0.04]-[2.69]	.	1 [1.00]-[1.00]	0.218	0.28 [0.04]-[2.21]	0.468	0
Income from: Other Trade (Specify):	261	5	1.9 [-0.8-4.7]	2.5	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.027	1

Income from: Casual Labour Wage (Portage, Construction, Etc.)	261	147	56.3 [47.6-65.1]	1.9	0.514	0.76 [0.33]-[1.77]	0.906	1.07 [0.33]-[3.52]	0.668	0.84 [0.37]-[1.92]	0.239
Income from: Casual Labour Wage (Farm Labour)	261	36	13.8 [5.8-21.8]	3.3	0.477	1.31 [0.61]-[2.83]	0.725	1.19 [0.44]-[3.21]	0.161	1.61 [0.82]-[3.17]	0.935
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	261	53	20.3 [12.8-27.8]	2.1	0.416	0.63 [0.20]-[1.98]	0.238	0.44 [0.11]-[1.78]	0.205	0.51 [0.17]-[1.48]	0.707
Income from: Skilled/Salary Work	261	16	6.1 [2.4-9.9]	1.5	0.132	2.24 [0.77]-[6.48]	0.098	3.3 [0.79]-[13.83]	0.257	1.82 [0.63]-[5.26]	0.285
Income from: Remittance	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	261	2	0.8 [-0.8-2.4]	2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0
Income from: Humanitarian Assistance (Cash)	261	5	1.9 [-0.3-4.2]	1.7	.	1 [1.00]-[1.00]	0.216	3.31 [0.48]-[22.90]	.	1 [1.00]-[1.00]	0.165
Income from: Productive Asset Sale	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Other Asset Sale	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Other Source of Cash Income	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Has assets: any animals	261	28	10.7 [5.4-16]	1.8	0.684	1.22 [0.45]-[3.33]	0.975	0.98 [0.23]-[4.19]	0.99	0.99 [0.36]-[2.74]	0.581
Has assets: sheepgoat	261	26	10 [4.7-15.2]	1.9	0.607	1.29 [0.47]-[3.52]	0.925	1.07 [0.25]-[4.52]	0.925	1.05 [0.38]-[2.91]	0.853
Has assets: donkey	261	26	10 [4-15.9]	2.4	.	1 [1.00]-[1.00]	0.407	0.48 [0.08]-[2.85]	.	1 [1.00]-[1.00]	0.741
Has assets: chicken	261	48	18.4 [8.8-28]	3.8	0.339	0.56 [0.17]-[1.89]	0.217	0.23 [0.02]-[2.50]	0.372	0.6 [0.19]-[1.89]	0.386
Has assets: land	261	167	64 [46.1-81.9]	8.6	0.328	0.72 [0.36]-[1.42]	0.567	0.76 [0.28]-[2.02]	0.412	0.76 [0.39]-[1.49]	0.002
Has assets: house	261	259	99.2 [97.7-100.8]	2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Has assets: radio	261	49	18.8 [3.8-33.8]	9.1	0.196	1.61 [0.77]-[3.35]	0.764	1.17 [0.41]-[3.32]	0.52	1.26 [0.61]-[2.63]	0.022
Has assets: bike	261	6	2.3 [-0.1-4.7]	1.6	0.852	1.26 [0.10]-[16.26]	.	1 [1.00]-[1.00]	0.972	1.05 [0.08]-[13.42]	0.707
Has assets: phone	261	246	94.3 [89.4-99.1]	2.7	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.144
Has assets: agtools	261	8	3.1 [0.1-6]	1.8	0.899	0.89 [0.15]-[5.28]	.	1 [1.00]-[1.00]	0.732	0.74 [0.12]-[4.44]	0.247
Has assets: skwtools	261	31	11.9 [1.7-22]	6.1	0.871	0.92 [0.33]-[2.54]	0.251	0.39 [0.08]-[2.01]	0.535	0.75 [0.29]-[1.93]	0.993
Has assets: cart	261	17	6.5 [1.3-11.7]	2.8	.	1 [1.00]-[1.00]	0.778	0.78 [0.14]-[4.52]	.	1 [1.00]-[1.00]	0.868
Has assets: wheelbarrow	261	20	7.7 [0.5-14.8]	4.4	0.561	0.72 [0.23]-[2.23]	0.531	1.46 [0.43]-[5.01]	0.354	0.59 [0.19]-[1.84]	0.902
Spends over 80% of earnings on food	261	14	5.4 [1.4-9.3]	1.9	0.943	1.05 [0.26]-[4.24]	0.065	3.94 [0.91]-[16.99]	0.593	1.46 [0.35]-[6.07]	0.354
Has savings	169	169	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Received humanitarian cereal food assistance	599	239	39.9 [35.2-44.6]	1.3	0.749	0.92 [0.53]-[1.59]	0.189	1.55 [0.80]-[3.00]	0.691	0.91 [0.56]-[1.47]	0.974
Household had no money or food <30 days	254	254	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Purchased cereal means other than cash	599	237	39.6 [34.9-44.3]	1.3	0.795	0.93 [0.54]-[1.61]	0.165	1.57 [0.82]-[2.99]	0.743	0.93 [0.57]-[1.49]	0.895
Purchased cereal means other than cash	599	0									
Received Vitamin A in last six months	599	83	13.9 [8.3-19.5]	3.7	0.972	1.01 [0.45]-[2.27]	0.891	1.08 [0.36]-[3.20]	0.566	0.8 [0.36]-[1.77]	0.347
Received measles vaccination in last six months	599	156	26 [19.9-32.1]	2.7	0.363	1.33 [0.71]-[2.49]	0.035	2.09 [1.06]-[4.11]	0.298	1.34 [0.76]-[2.38]	0.373

	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	
Received polio vaccination in last six months	288	266	92.4 [87.7-97]	2.1	0.189	3.94 [0.49]-[31.89]	0.738	0.77 [0.16]-[3.78]	0.338	2.14 [0.43]-[10.62]	0.205	1
Diarrhoea in last 2 weeks	599	41	6.8 [4-9.7]	1.8	0.156	1.72 [0.80]-[3.69]	0	10.08 [3.98]-[25.53]	0.004	2.88 [1.45]-[5.73]	0.517	1
Pneumonia in last 2 weeks	599	41	6.8 [4-9.7]	1.8	0.156	1.72 [0.80]-[3.69]	0	10.08 [3.98]-[25.53]	0.004	2.88 [1.45]-[5.73]	0.517	1
fever in last 2 weeks	599	31	5.2 [2.7-7.7]	1.8	0.005	3.44 [1.49]-[7.93]	0.355	1.86 [0.48]-[7.14]	0.02	2.74 [1.19]-[6.31]	0.434	(
measles in last 2 weeks	599	1	0.2 [-0.2-0.5]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
morbidity in last two weeks	599	63	10.5 [7-14]	1.8	0.003	2.58 [1.43]-[4.68]	0.001	6.38 [2.44]-[16.69]	0	3.23 [1.82]-[5.75]	0.912	0
HDD: Cereals in last 24 hr	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: White Roots And Tubers in last 24 hr	261	8	3.1 [0.3-5.8]	1.5	0.924	0.89 [0.08]-[9.65]	0.615	1.87 [0.15]-[23.09]	0.798	0.74 [0.07]-[8.15]	0.536	0
HDD: Vitamin A Rich Vegetables in last 24 hr	261	1	0.4 [-0.4-1.2]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Dark Green Leafy Vegetables in last 24 hr	261	14	5.4 [0.8-9.9]	2.5	0.96	1.05 [0.14]-[7.70]	0.981	0.98 [0.16]-[5.95]	0.882	0.86 [0.12]-[6.42]	0.247	1
HDD: Other Vegetables in last 24 hr	261	153	58.6 [48.4-68.9]	2.7	0.919	0.96 [0.41]-[2.24]	0.95	0.97 [0.34]-[2.75]	0.615	0.81 [0.34]-[1.91]	0.92	1
HDD: Vitamin A Rich Fruits in last 24 hr	261	6	2.3 [-1.6-6.2]	4.2	0.481	1.26 [0.64]-[2.48]	.	1 [1.00]-[1.00]	0.885	1.05 [0.56]-[1.94]	0.68	0.
HDD: Other Fruits in last 24 hr	261	1	0.4 [-0.4-1.2]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Organ Meat in last 24 hr	261	2	0.8 [-0.3-1.9]	1	0.214	6.44 [0.32]-[129.70]	.	1 [1.00]-[1.00]	0.263	5.32 [0.26]-[107.23]	.	
HDD: Flesh Meats in last 24 hr	260	12	4.6 [0-9.3]	3	0.653	0.69 [0.13]-[3.75]	0.89	1.16 [0.13]-[10.61]	0.497	0.57 [0.10]-[3.08]	0.947	1
HDD: Eggs in last 24 hr	261	5	1.9 [0-3.8]	1.2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.399	1
HDD: Fish And Seafood in last 24 hr	261	13	5 [1.4-8.6]	1.7	0.831	1.15 [0.30]-[4.40]	0.2	2.47 [0.60]-[10.14]	0.545	1.61 [0.33]-[7.95]	.	
HDD: Legumes, Nuts And Seeds in last 24 hr	261	149	57.1 [48-66.2]	2.1	0.572	0.78 [0.31]-[1.93]	0.336	1.69 [0.56]-[5.06]	0.932	0.96 [0.40]-[2.33]	0.515	0
HDD: Milk And Milk Products	261	152	58.2 [43.3-73.2]	5.7	0.374	0.73 [0.36]-[1.48]	0.29	0.62 [0.25]-[1.53]	0.539	0.81 [0.40]-[1.63]	0.119	1
HDD: Oils And Fats	261	259	99.2 [98.2-100.3]	0.9	.	1 [1.00]-[1.00]	0.067	0.07 [0.00]-[1.21]	0.24	0.19 [0.01]-[3.26]	.	
HDD: Sweets	261	249	95.4 [91.3-99.5]	2.3	0.015	0.4 [0.20]-[0.82]	.	1 [1.00]-[1.00]	0.049	0.49 [0.24]-[1.00]	0.063	0
HDD: Spices, Condiments, Beverages	261	261	100 [100-100]	0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Any veg	261	162	62.1 [52.6-71.5]	2.3	0.85	0.93 [0.41]-[2.11]	0.705	0.83 [0.30]-[2.27]	0.509	0.76 [0.33]-[1.75]	0.747	1
HDD: Any fruit	261	7	2.7 [-1.2-6.6]	3.7	0.921	1.05 [0.39]-[2.80]	.	1 [1.00]-[1.00]	0.758	0.87 [0.34]-[2.22]	0.68	0.
HDD: Any meat	261	14	5.4 [0.4-10.3]	2.9	0.746	1.27 [0.28]-[5.78]	0.984	0.98 [0.11]-[8.77]	0.952	1.05 [0.23]-[4.75]	0.615	0
HDD: Four+ food groups in last 7 days	599	247	41.2 [37.9-44.6]	0.6	0.75	0.92 [0.53]-[1.59]	0.045	1.87 [1.01]-[3.45]	0.663	0.9 [0.56]-[1.46]	0.922	0
HDD: Four+ food groups in last 7 dayless than mean score	599	341	56.9 [54-59.9]	0.5	0.668	1.12 [0.64]-[1.96]	0.08	0.58 [0.31]-[1.07]	0.548	1.16 [0.71]-[1.89]	0.847	0
WASH: Main source of drinking water unprotected	261	0										
WASH: Toilet used by most members of the household	261	28	10.7 [2.6-18.9]	4.3	0.502	1.58 [0.40]-[6.26]	0.073	2.42 [0.92]-[6.40]	0.327	1.66 [0.58]-[4.73]	0.3	1

Table 28: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Deyr season, 2020 (FSNAU)

Risk factor *Logistic Regression* Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	Wasting (W/H) *Children 6-59 months* P-value	Odds Ratio [95% CI]	Wasting (MUAC) *Children 6-59 months* P-value	Odds Ratio [95% CI]	Wasting by MUAC and/or W/H *Children 6-59 months* P-value	Odds Ratio [95% CI]	S Childre P-value
Male child	625	311	49.8 [46.3-53.2]	0.7	0.358	1.27 [0.75]-[2.13]	0.553	0.79 [0.35]-[1.78]	0.407	1.22 [0.75]-[2.00]	0.024
Age group -<24 months	625	210	33.6 [28.2-39]	2	0.545	0.84 [0.46]-[1.53]	0	23.78 [5.81]-[97.28]	0.088	1.62 [0.93]-[2.82]	0.34
Age group -<36 months	625	375	60 [52.9-60.9]	1	0.102	0.84 [0.46]-[1.53]	0.002	0.27 [3.7]-[201.8]	0.973	1 [0.60]-[1.69]	0
Received Vitamin A in last six months	625	131	21 [5.7-36.2]	20.8	0.457	1.12 [0.83]-[1.52]	.	1 [1.00]-[1.00]	0.153	0.81 [0.61]-[1.08]	0
Received measles vaccination in last six months	625	157	25.1 [10.2-40.1]	17.6	0.711	1.09 [0.67]-[1.77]	0.635	0.76 [0.24]-[2.43]	0.729	1.08 [0.69]-[1.70]	0.018
Received polio vaccination in last six months	625	618	98.9 [97.9-99.9]	1.4	.	1 [1.00]-[1.00]	0.356	0.34 [0.03]-[3.62]	0.859	1.24 [0.11]-[13.84]	0.619
Diarrhea in last 2 weeks	625	34	5.4 [2.5-8.4]	2.5	0.55	1.42 [0.43]-[4.69]	0	9.84 [3.62]-[26.75]	0.042	3.01 [1.04]-[8.71]	0.547
Pneumonia in last 2 weeks	625	34	5.4 [2.5-8.4]	2.5	0.55	1.42 [0.43]-[4.69]	0	9.84 [3.62]-[26.75]	0.042	3.01 [1.04]-[8.71]	0.547
fever in last 2 weeks	625	99	15.8 [7.4-24.3]	8	0.371	1.41 [0.65]-[3.09]	0.3	1.69 [0.61]-[4.69]	0.385	1.33 [0.69]-[2.56]	0.979
measles in last 2 weeks	625	7	1.1 [0.2-2]	1.1	.	1 [1.00]-[1.00]	0.364	2.95 [0.27]-[32.85]	0.856	0.81 [0.08]-[8.66]	0.569
morbidity in last two weeks	625	118	18.9 [10.1-27.7]	7.5	0.634	1.19 [0.57]-[2.51]	0.035	2.5 [1.07]-[5.82]	0.221	1.44 [0.79]-[2.63]	0.71

Table 29: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Gu season, 2015 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		Stunting *Children 6-59 month*	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Male child	868	457	52.6 [49.3-56]	0.9	0.144	1.32 [0.90-1.94]	0.899	0.97 [0.62-1.53]	0.302	1.19 [0.85-1.66]	0.005	1.58 [1.16-2.
Main provider female	920	163	17.7 [13.8-21.6]	2.2	0.366	0.8 [0.48-1.32]	0.612	1.18 [0.60-2.31]	0.264	0.79 [0.52-1.21]	0.514	0.86 [0.54-1.
Household head female	213	213	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
Age group -<24 months	868	281	32.4 [29.3-35.4]	0.9	0.768	0.96 [0.72-1.28]	0	8.04 [4.72-13.71]	0.021	1.43 [1.06-1.92]	0.000	3.5 [2.38-5.
Age group -<36 months		868	56.3 [29.3-35.4]	0.7	0.257	0.85 [0.63-1.40]	0	15.49 [4.4-58.3]	0.6	1.1 [.80-1.48]	0.000	5.71 [3.76-8
Above average household size (> =6 members)	933	465	49.8 [46.1-53.6]	1.3	0.817	1.04 [0.72-1.51]	0.457	1.17 [0.76-1.80]	0.824	1.04 [0.72-1.50]	0.795	1.05 [0.74-1
Number of children under 5 >1	933	653	70 [65.3-74.7]	2.3	1	1 [0.68-1.48]	0.728	0.91 [0.52-1.59]	0.966	1.01 [0.70-1.45]	0.762	1.06 [0.72-1
Household displaced by insecurity	920	477	51.8 [43.2-60.5]	6.4	0.014	1.48 [1.09-2.01]	0.249	1.37 [0.79-2.39]	0.007	1.52 [1.14-2.04]	0.645	1.08 [0.77-1
Household displaced by drought	920	357	38.8 [30.4-47.2]	6.4	0.05	0.73 [0.53-1.00]	0.617	0.87 [0.50-1.52]	0.045	0.74 [0.55-0.99]	0.527	1.1 [0.81-1.
Household displaced by eviction	920	11	1.2 [0-2.4]	2.6	0.233	0.31 [0.04-2.24]	0.879	1.16 [0.16-8.40]	0.188	0.27 [0.04-1.98]	0.286	0.35 [0.05-2
Household displaced by conflict	920	64	7 [1.7-12.2]	9.3	0.324	0.71 [0.35-1.43]	0.084	0.34 [0.10-1.17]	0.267	0.69 [0.36-1.35]	0.350	0.55 [0.15-1
Household displaced by loss of livelihood	920	7	0.8 [0-1.5]	1.7	0.044	3.77 [1.04-13.66]	.	1 [1.00-1.00]	0.066	3.32 [0.92-12.02]	0.427	0.53 [0.10-2
Primary occupation: Casual labor	933	274	29.4 [25.3-33.4]	1.7	0.959	0.99 [0.70-1.41]	0.112	1.37 [0.92-2.03]	0.709	1.07 [0.75-1.52]	0.500	0.91 [0.69-1
Primary occupation: self employed	933	137	14.7 [10.4-19]	3.3	0.701	0.91 [0.56-1.48]	0.612	1.16 [0.64-2.09]	0.862	0.96 [0.62-1.49]	0.814	0.95 [0.61-1
Primary occupation: petty trade	933	111	11.9 [9.2-14.6]	1.5	0.681	0.9 [0.53-1.53]	0.713	0.91 [0.54-1.54]	0.575	0.88 [0.56-1.39]	0.430	0.78 [0.41-1
Primary occupation: other trade	933	37	4 [2.4-5.5]	1.4	0.281	0.57 [0.20-1.63]	0.492	0.63 [0.16-2.45]	0.227	0.61 [0.27-1.39]	0.601	1.21 [0.58-2
Primary occupation: skilled trade	933	19	2 [0.7-3.4]	2.1	0.09	1.89 [0.90-3.98]	0.791	0.75 [0.08-6.73]	0.039	2.2 [1.05-4.64]	0.163	2.16 [0.72-6
Low wage (2/3 of mean wage per person per day)	460	366	79.6 [71.9-87.2]	3.9	0.831	0.94 [0.50-1.76]	0.816	1.12 [0.41-3.10]	0.911	0.97 [0.52-1.79]	0.522	0.81 [0.43-1
Income from: Sales Of Camel And Cattle	465	5	1.1 [-0.2-2.3]	1.6	0.004	3.99 [1.63-9.79]	.	1 [1.00-1.00]	0.008	3.46 [1.42-8.41]	.	1 [1.00-1.0
Income from: Livestock Sale (Sheep/Goat)	465	54	11.6 [4.7-18.5]	5.1	0.599	0.8 [0.34-1.88]	0.553	1.21 [0.63-2.32]	0.521	0.77 [0.34-1.74]	0.046	1.68 [1.01-2
Income from: Crop Sale	465	21	4.5 [1.6-7.4]	2.2	0.415	1.32 [0.66-2.64]	0.879	1.14 [0.20-6.42]	0.251	1.47 [0.75-2.88]	0.958	0.98 [0.40-2
Income from: Petty Trade	465	5	1.1 [-0.5-2.6]	2.5	0	3.99 [2.18-7.30]	.	1 [1.00-1.00]	0	3.46 [1.89-6.34]	0.382	2.31 [0.33-16
Income from: Other Trade (Specify):	465	124	26.7 [21.5-31.8]	1.5	0.412	0.82 [0.49-1.35]	0.158	0.63 [0.33-1.21]	0.237	0.77 [0.49-1.20]	0.232	0.63 [0.29-1
Income from: Casual Labour Wage (Portage, Construction, Etc.)	465	203	43.7 [35.5-51.8]	3	0.345	0.8 [0.49-1.30]	0.698	0.89 [0.48-1.66]	0.519	0.87 [0.55-1.36]	0.794	1.07 [0.61-1
Income from: Casual Labour Wage (Farm Labour)	465	84	18.1 [12.4-23.7]	2.4	0.353	1.23 [0.78-1.93]	0.218	1.66 [0.73-3.77]	0.25	1.29 [0.83-1.99]	0.812	0.93 [0.51-1

	N	n	% [CI]									
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	465	165	35.5 [25.9-45]	4.4	0.466	1.2 [0.72-2.01]	0.95	1.02 [0.54-1.93]	0.66	1.12 [0.66-1.91]	0.971	1.01 [0.65-1
Income from: Skilled/Salary Work	465	17	3.7 [1.5-5.8]	1.4	0.23	0.39 [0.08-1.88]	0.673	0.64 [0.07-5.57]	0.377	0.56 [0.15-2.13]	0.497	0.56 [0.10-3
Income from: Remittance	465	3	0.6 [-0.1-1.4]	0.9	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	0.397	3.45 [0.18-66
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	465	66	14.2 [6-22.4]	6.1	0.702	1.13 [0.60-2.14]	0.036	2.11 [1.06-4.22]	0.563	1.16 [0.69-1.93]	0.039	1.56 [1.03-2
Income from: Humanitarian Assistance (Cash)	465	87	18.7 [9.6-27.8]	5.9	0.055	0.61 [0.37-1.01]	0.976	0.99 [0.49-2.00]	0.025	0.56 [0.34-0.93]	0.961	1.01 [0.60-1
Income from: Productive Asset Sale	465	2	0.4 [-0.2-1]	0.9	0.51	2.62 [0.13-51.13]	.	1 [1.00-1.00]	0.572	2.28 [0.12-43.95]	.	1 [1.00-1.0
Income from: Other Asset Sale	465	1	0.2 [-0.2-0.7]	1	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
Income from: Other Source of Cash Income	0	0			.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
Has assets: any animals	465	16	3.4 [0.6-6.3]	2.7	0.873	1.16 [0.17-7.90]	0.769	0.75 [0.11-5.36]	0.994	1.01 [0.15-6.85]	0.632	0.6 [0.07-5.
Has assets: sheepgoat	468	132	28.3 [19.9-36.7]	3.8	0.377	1.27 [0.74-2.18]	0.378	0.78 [0.44-1.38]	0.445	1.23 [0.71-2.11]	0.734	1.07 [0.71-1
Has assets: donkey	470	103	21.9 [13.6-30.2]	4.4	0.709	1.11 [0.63-1.94]	0.742	0.92 [0.55-1.54]	0.653	1.12 [0.67-1.89]	0.506	0.85 [0.52-1
Has assets: chicken	470	181	38.5 [29.8-47.3]	3.6	0.998	1 [0.62-1.61]	0.979	1.01 [0.57-1.79]	0.772	1.07 [0.66-1.75]	0.996	1 [0.53-1.8
Has assets: land	470	221	47 [36.2-57.9]	5.2	0.888	0.97 [0.64-1.47]	0.081	0.61 [0.34-1.07]	0.96	0.99 [0.69-1.42]	0.822	0.95 [0.59-1
Has assets: house	470	437	93 [89.4-96.5]	2.1	0.593	0.85 [0.45-1.59]	0.54	1.51 [0.39-5.89]	0.541	0.83 [0.45-1.54]	0.741	0.85 [0.30-2
Has assets: radio	470	157	33.4 [21-45.8]	7.6	0.41	1.2 [0.77-1.86]	0.983	0.99 [0.47-2.10]	0.57	1.13 [0.74-1.72]	0.686	1.11 [0.66-1
Has assets: bike	470	11	2.4 [0.7-4]	1.2	0.946	0.96 [0.32-2.91]	.	1 [1.00-1.00]	0.74	0.84 [0.28-2.50]	.	1 [1.00-1.0
Has assets: phone	468	352	75.3 [68.2-82.4]	3	0.946	1.02 [0.63-1.64]	0.647	1.25 [0.46-3.40]	0.606	1.15 [0.67-1.96]	0.130	1.71 [0.84-3
Has assets: agtools	470	45	9.5 [4.9-14.2]	2.8	0.961	1.01 [0.59-1.75]	0.718	1.21 [0.42-3.49]	0.943	0.98 [0.58-1.66]	0.280	0.57 [0.20-1
Has assets: skwtools	462	14	3 [0.4-5.5]	2.5	0.744	0.86 [0.33-2.21]	.	1 [1.00-1.00]	0.529	0.75 [0.29-1.92]	0.410	1.7 [0.46-6.
Has assets: cart	470	72	15.4 [7.8-22.9]	4.8	0.977	1.01 [0.45-2.30]	0.411	1.35 [0.64-2.83]	0.609	1.21 [0.56-2.63]	0.671	1.12 [0.65-1
Has assets: wheelbarrow	469	24	5.1 [2.1-8.2]	2.1	0.227	1.71 [0.70-4.16]	0.845	0.86 [0.18-4.04]	0.389	1.47 [0.59-3.66]	0.155	0.32 [0.06-1
Spends over 80% of earnings on food	468	96	20.6 [14.5-26.7]	2.4	0.196	1.41 [0.83-2.41]	0.355	1.41 [0.66-3.02]	0.406	1.26 [0.72-2.20]	0.298	1.36 [0.75-2
Received humanitarian cereal food assistance	454	121	26.7 [14.3-39.1]	8.5	0.744	1.1 [0.61-1.99]	0.736	1.15 [0.50-2.61]	0.954	1.02 [0.56-1.85]	0.645	1.18 [0.57-2
Household had no money or food <30 days	460	186	40.4 [30.7-50.2]	4.2	0.76	0.92 [0.51-1.64]	0.247	0.65 [0.30-1.38]	0.603	0.86 [0.47-1.56]	0.513	0.88 [0.58-1
Cereal means other than cash	455	105	23 [13.4-32.6]	5.7	0.531	0.85 [0.50-1.45]	0.322	0.52 [0.13-1.98]	0.323	0.76 [0.43-1.33]	0.558	1.15 [0.71-1
Cereal means other than cash	465	76	16.3 [10.2-22.5]	3	0.808	0.95 [0.62-1.46]	0.785	0.87 [0.29-2.55]	0.592	0.88 [0.54-1.43]	0.538	0.83 [0.44-1
Child was breastfed	465	220	47.4 [41.8-52.9]	0.9	0.593	0.85 [0.46-1.57]	0.018	2.38 [1.18-4.80]	0.403	1.31 [0.68-2.50]	0.470	0.81 [0.45-1
Child was breastfed until 2 years	302	36	11.9 [1.6-22.3]	1.6	0.725	0.78 [0.19-3.20]	0.126	4.58 [0.63-33.19]	0.686	1.3 [0.35-4.87]	0.518	2.08 [0.21-20
Child was breastfed until 1 years	67	37	55.1 [36.3-73.9]	1.6	0.268	2.33 [0.49-11.06]	0.657	1.44 [0.26-7.84]	0.364	1.8 [0.48-6.78]	0.541	1.49 [0.38-5
Early introduction of complementary foods (< 6 months)	49	7	14.3 [7.4-21.3]	2	0.771	0.86 [0.29-2.51]	0.594	1.25 [0.54-2.91]	0.766	0.89 [0.42-1.92]	0.133	0.5 [0.20-1.

Introduction to complementary foods: 6-8 months	223	151	67.7 [60.6-74.8]	1.2	0.612	0.86 [0.48-1.56]	0.812	0.94 [0.57-1.56]	0.373	0.83 [0.54-1.27]	0.289	1.48 [0.70-3
Child is currently breastfed	223	106	47.4 [41.8-52.9]	0.9	0.593	0.85 [0.46-1.57]	0.018	2.38 [1.18-4.80]	0.403	1.31 [0.68-2.50]	0.470	0.81 [0.45-1
Received Vitamin A in last six months	302	75	24.8 [16.4-33.2]	7.8	0.449	0.86 [0.58-1.28]	0.08	1.59 [0.94-2.67]	0.77	0.95 [0.66-1.36]	0.157	0.72 [0.45-1
Received measles vaccination in last six months	868	311	35.8 [27.2-44.5]	6.6	0.619	1.09 [0.77-1.55]	0.85	0.95 [0.52-1.72]	0.493	1.12 [0.80-1.59]	0.138	0.71 [0.45-1
Received polio vaccination in last six months	868	868	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
Diarrhea in last 2 weeks	868	57	6.6 [3.4-9.8]	3.4	0.212	1.23 [0.88-1.71]	0	8.18 [4.11-16.27]	0.01	1.99 [1.20-3.32]	0.004	2.54 [1.38-4
Pneumonia in last 2 weeks	868	57	6.6 [3.4-9.8]	3.4	0.212	1.23 [0.88-1.71]	0	8.18 [4.11-16.27]	0.01	1.99 [1.20-3.32]	0.004	2.54 [1.38-4
fever in last 2 weeks	868	178	20.5 [14.8-26.2]	4.1	0.064	1.47 [0.98-2.22]	0.008	2.24 [1.26-3.96]	0.032	1.58 [1.04-2.39]	0.752	1.06 [0.73-1
measles in last 2 weeks	868	17	2 [-0.2-4.2]	5.2	0.274	1.99 [0.56-7.10]	0.368	1.42 [0.65-3.13]	0.37	1.76 [0.49-6.25]	0.644	0.68 [0.12-3
morbidity in last two weeks	868	252	29 [22.9-35.2]	3.7	0.014	1.57 [1.10-2.24]	0.001	2.78 [1.58-4.89]	0.009	1.66 [1.15-2.42]	0.967	1.01 [0.69-1
child registered at feeding programme	868	868	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
HDD: Cereals in last 24 hr	14	14	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
HDD: White Roots And Tubers in last 24 hr	465	40	8.6 [4.1-13.1]	2.8	0.829	1.1 [0.43-2.80]	0.107	1.82 [0.87-3.79]	0.324	1.41 [0.70-2.88]	0.559	0.79 [0.35-1
HDD: Vitamin A Rich Vegetables in last 24 hr	465	46	9.9 [4.5-15.3]	3.6	0.922	1.04 [0.47-2.28]	0.902	0.95 [0.41-2.21]	0.764	0.89 [0.40-1.97]	0.363	1.47 [0.63-3
HDD: Dark Green Leafy Vegetables in last 24 hr	465	32	6.9 [3.1-10.7]	2.5	0.624	1.25 [0.49-3.20]	0.491	0.61 [0.14-2.64]	0.869	1.08 [0.43-2.71]	0.095	1.85 [0.89-3
HDD: Other Vegetables in last 24 hr	465	121	26 [18.2-33.9]	3.5	0.743	1.09 [0.63-1.91]	0.278	1.53 [0.70-3.35]	0.734	1.09 [0.66-1.77]	0.949	0.99 [0.64-1
HDD: Vitamin A Rich Fruits in last 24 hr	465	15	3.2 [0.2-6.2]	3.2	0.329	0.7 [0.33-1.47]	0.674	0.69 [0.11-4.15]	0.177	0.6 [0.29-1.27]	0.730	0.74 [0.12-4
HDD: Other Fruits in last 24 hr	465	23	4.9 [1-8.9]	3.7	0.111	0.42 [0.14-1.24]	0.425	0.44 [0.05-3.53]	0.055	0.51 [0.26-1.02]	0.024	1.72 [1.08-2
HDD: Organ Meat in last 24 hr	465	15	3.2 [0.5-5.9]	2.5	0.044	0.19 [0.04-0.95]	0.637	0.69 [0.14-3.41]	0.031	0.17 [0.03-0.84]	0.145	0.27 [0.05-1
HDD: Flesh Meats in last 24 hr	465	43	9.2 [5.5-13]	1.8	0.143	0.46 [0.16-1.33]	0.7	0.74 [0.15-3.69]	0.129	0.48 [0.18-1.26]	0.631	1.22 [0.53-2
HDD: Eggs in last 24 hr	465	21	4.5 [1-8]	3.1	0.088	2.02 [0.89-4.57]	0.942	0.95 [0.24-3.71]	0.178	1.74 [0.76-3.96]	0.939	1.05 [0.31-3
HDD: Fish And Seafood in last 22 hr	465	9	1.9 [0.5-3.3]	1.1	0.666	1.3 [0.38-4.50]	.	1 [1.00-1.00]	0.845	1.13 [0.32-3.96]	0.189	3.44 [0.52-22
HDD: Legumes, Nuts And Seeds in last 24 hr	465	272	58.5 [49-68]	4	0.945	0.98 [0.62-1.56]	0.166	0.61 [0.30-1.25]	0.394	0.82 [0.50-1.32]	0.502	0.86 [0.55-1
HDD: Milk And Milk Products	465	261	56.1 [44.4-67.9]	6.2	0.334	1.22 [0.81-1.84]	0.899	0.95 [0.45-2.01]	0.59	1.11 [0.75-1.66]	0.458	1.26 [0.67-2
HDD: Oils And Fats	465	419	90.1 [85.4-94.9]	2.8	0.537	0.82 [0.42-1.59]	0.081	0.49 [0.22-1.10]	0.144	0.67 [0.38-1.16]	0.818	1.07 [0.58-1
HDD: Sweets	465	434	93.3 [90-96.6]	1.9	0.48	0.68 [0.22-2.08]	0.919	0.95 [0.36-2.54]	0.66	0.79 [0.26-2.39]	0.926	1.05 [0.35-3
HDD: Spices, Condiments, Beverages	465	394	84.7 [78.7-90.7]	3.1	0.737	0.89 [0.45-1.79]	0.446	0.79 [0.43-1.47]	0.527	0.82 [0.44-1.54]	0.677	0.9 [0.54-1
HDD: Any veg	465	164	35.3 [24.9-45.7]	5.1	0.801	1.07 [0.62-1.85]	0.658	1.16 [0.59-2.30]	0.988	1 [0.59-1.71]	0.315	1.29 [0.77-2
HDD: Any fruit	465	34	7.3 [2.5-12.1]	3.7	0.052	0.47 [0.22-1.01]	0.429	0.61 [0.17-2.18]	0.02	0.52 [0.30-0.89]	0.585	1.12 [0.73-1
HDD: Any meat	465	54	11.6 [7.8-15.4]	1.6	0.066	0.41 [0.15-1.07]	0.708	0.79 [0.21-2.91]	0.051	0.41 [0.17-1.01]	0.952	1.02 [0.46-2
HDD: Four+ food groups in last 7 days	465	213	45.1 [50-58.3]	1.5	0.554	1.12[0.76-1.64]	1.29	1.29 [0.84-1.98]	1.13	1.13 [0.79-1.61]	0.696	0.96 [0.72-1
HDD: Four+ food groups in last 7 dayless than mean score	450	235	45.9 [41.7-50]	1.5	0.374	0.86[0.60-1.22]	0.203	0.76 [0.49-1.17]	0.297	0.83 [0.57-1.19]	0.497	1.1 [0.83-1

IDD: Cereals, roots and tubers	450	423	93.9 [90.7-97.1]	2.8	0.872	0.93 [0.37-2.33]	0.001	0.18 [0.07-0.45]	0.09	0.58 [0.31-1.10]	0.000	0.18 [0.08-0
IDD: Legumes,nutsandseeds	933	350	37.5 [27.1-47.9]	1.7	0.855	0.96 [0.58-1.57]	0.054	0.54 [0.29-1.01]	0.331	0.78 [0.47-1.31]	0.956	1.01 [0.61-
IDD: Milk and milk products	933	731	78.4 [71.1-85.7]	6.6	0.57	0.83 [0.42-1.62]	0.173	1.66 [0.79-3.49]	0.788	0.92 [0.50-1.69]	0.237	1.38 [0.80-2
IDD: Flesh (meat,fishandpoultry) products	378	5	1.3 [-0.2-2.9]	2.2	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
IDD: Eggs	373	32	8.6 [0.9-16.3]	3.4	0.307	0.8 [0.51-1.25]	0.09	1.7 [0.92-3.14]	0.73	1.09 [0.67-1.77]	0.421	0.72 [0.32-1
IDD: Vitamin A	380	5	1.3 [-0.5-3.2]	2	0.573	0.69 [0.18-2.62]	.	1 [1.00-1.00]	0.383	0.56 [0.15-2.14]	.	1 [1.00-1.0
IDD: Other fruits and vegetables	373	15	4 [0.1-7.9]	2.2	0.545	1.4 [0.45-4.28]	0.49	0.49 [0.06-4.04]	0.826	1.13 [0.37-3.43]	0.885	0.89 [0.17-4
IDD: Over mean IDDS	662	468	70.7 [65.5-75.9]	3.4	0.131	0.74 [0.50-1.10]	0.009	0.5 [0.31-0.83]	0.07	0.68 [0.44-1.04]	0.902	1.03 [0.67-1
IDD: Yesterday: Vitamin A	373	5	1.3 [-0.5-3.2]	2.8	0.573	0.69 [0.18-2.62]	.	1 [1.00-1.00]	0.383	0.56 [0.15-2.14]	.	1 [1.00-1.0
IDD: other veg	374	15	4 [0.1-7.9]	4	0.545	1.4 [0.45-4.28]	0.49	0.49 [0.06-4.04]	0.826	1.13 [0.37-3.43]	0.885	0.89 [0.17-4
IDD: Milk and milk products	380	298	78.4 [71.1-85.7]	1.7	0.57	0.83 [0.42-1.62]	0.173	1.66 [0.79-3.49]	0.788	0.92 [0.50-1.69]	0.237	1.38 [0.80-2
IDD: Legumes,nutsandseeds	373	140	37.5 [27.1-47.9]	6.6	0.855	0.96 [0.58-1.57]	0.054	0.54 [0.29-1.01]	0.331	0.78 [0.47-1.31]	0.956	1.01 [0.61-1
IDD: Fish	373	5	1.3 [-0.2-2.9]	1.6	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.0
IDD: Eggs	373	32	8.6 [0.9-16.3]	6.2	0.307	0.8 [0.51-1.25]	0.09	1.7 [0.92-3.14]	0.73	1.09 [0.67-1.77]	0.421	0.72 [0.32-1
IDD: Cereals, roots and tubers	378	355	93.9 [90.7-97.1]	4.1	0.872	0.93 [0.37-2.33]	0.001	0.18 [0.07-0.45]	0.09	0.58 [0.31-1.10]	0.000	0.18 [0.08-0
Unprotected source of drinking water	463	28	6 [0.4-11.7]	2.5	0.724	0.81 [0.25-2.67]	0.898	1.14 [0.15-8.92]	0.545	0.7 [0.21-2.30]	0.672	1.25 [0.43-3
Unimproved toilet	463	33	7.1[2.7-17.5]	7.4	0.17	1.6 [.79 - 3.5]	0.159	2.36 [.7 - 7.9]	0.322	1.4 [.69 - 2.9]	0.487	.68 [.18 - 2
Mother any education	801	87	10.9 [6.3-15.4]	4.1	0.714	0.91 [0.53-1.55]	0.588	1.25 [0.54-2.88]	0.895	0.96 [0.52-1.79]	0.390	0.8 [0.47-1.
Mother slept under a mosquito net last night	799	701	87.7 [84-91.5]	2.5	0.822	1.06 [0.61-1.84]	0.681	0.82 [0.30-2.22]	0.69	0.92 [0.58-1.44]	0.783	1.08 [0.61-1
Past 7 days: Shifted to less preferred (low quality, less expensive) foods	286	176	61.5 [48.9-74.2]	4.5	0.823	1.08 [0.54]-[2.17]	0.864	0.94 [0.46]-[1.94]	0.866	1.05 [0.57]-[1.94]	0.356	0.76 [0.42]-[1
Past 7 days: Limited the portion/quantity consumed in a meal	282	52	18.4 [11.4-25.5]	2.2	0.366	1.47 [0.62]-[3.48]	0.446	0.71 [0.29]-[1.77]	0.441	1.32 [0.64]-[2.72]	0.557	0.81 [0.39]-[1
Past 7 days: Took fewer numbers of meals in a day	282	98	34.8 [23.7-45.8]	3.5	0.713	0.88 [0.43]-[1.80]	0.328	0.62 [0.23]-[1.66]	0.796	0.92 [0.46]-[1.83]	0.821	0.94 [0.52]-[1
Past 7 days: Borrowed food on credit from the shop/market	284	190	66.9 [55.9-77.9]	3.6	0.413	0.79 [0.43]-[1.43]	0.222	0.55 [0.21]-[1.47]	0.27	0.71 [0.37]-[1.34]	0.644	1.15 [0.63]-[2
Past 7 days: Borrowed food on credit from another household (Amaah)?	281	132	47 [37.4-56.5]	2.4	0.912	1.03 [0.60]-[1.76]	0.797	1.12 [0.45]-[2.77]	0.499	1.2 [0.70]-[2.06]	0.535	0.83 [0.45]-[1
Past 7 days: Restricted consumption of adults for small children to eat?	281	46	16.4 [8.6-24.2]	2.9	0.564	1.26 [0.55]-[2.88]	0.642	0.75 [0.22]-[2.62]	0.758	1.14 [0.47]-[2.79]	0.301	1.49 [0.68]-[3
Past 7 days: Relied on food donations from relatives	282	62	22 [14.7-29.2]	2	0.6	0.86 [0.48]-[1.55]	0.93	0.96 [0.41]-[2.28]	0.815	0.93 [0.48]-[1.78]	0.528	0.79 [0.36]-[1

Past 7 days: Relied on food donations from the clan/community	282	49	17.4 [10.3-24.4]	2.3	0.538	0.76 [0.31]-[1.88]	0.829	0.9 [0.32]-[2.50]	0.815	0.91 [0.41]-[2.02]	0.076	1.76 [0.94]-[3
Past 7 days: Sought or rely on food aid from humanitarian agencie	282	18	6.4 [2.3-10.5]	1.8	0.499	0.72 [0.27]-[1.94]	0.391	0.45 [0.07]-[2.99]	0.681	0.82 [0.30]-[2.23]	0.235	0.41 [0.09]-[1
Past 7 days: Sent household members to eat elsewhere	281	18	6.4 [1.2-11.6]	2.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.277	0.58 [0.21]-[1
Past 7 days: Begged for food	280	6	2.1 [-0.6-4.9]	2.3	0.57	0.47 [0.03]-[7.14]	.	1 [1.00]-[1.00]	0.481	0.39 [0.03]-[5.99]	0.729	0.64 [0.05]-[8
Past 7 days: Skipped entire days without eating	279	11	3.9 [0.5-7.3]	2	0.036	3.32 [1.09]-[10.15]	0.346	2.57 [0.34]-[19.63]	0.076	2.73 [0.89]-[8.37]	0.027	3.45 [1.17]-[1

Table 30: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Gu season, 2016 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 6-59 months*		Wasting (MUAC) *Children 6-59 months*		Wasting by MUAC and/or W/H *Children 6-59 months*		*Ch*
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value
Male child	868	457	52.6 [49.3-56]	0.9	0.144	1.32 [0.90-1.94]	0.899	0.97 [0.62-1.53]	0.302	1.19 [0.85-1.66]	0.005
Main provider female	920	163	17.7 [13.8-21.6]	2.2	0.366	0.8 [0.48-1.32]	0.612	1.18 [0.60-2.31]	0.264	0.79 [0.52-1.21]	0.514
Household head female	213	213	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Age group -<24 months	868	281	32.4 [29.3-35.4]	0.9	0.768	0.96 [0.72-1.28]	0	8.04 [4.72-13.71]	0.021	1.43 [1.06-1.92]	0.000
Age group -<36 months		868	56.3 [29.3-35.4]	0.7	0.257	0.85 [0.63-1.40]	0	15.49 [4.4-58.3]	0.6	1.1 [.80-1.48]	0.000
Above average household size (> =6 members)	933	465	49.8 [46.1-53.6]	1.3	0.817	1.04 [0.72-1.51]	0.457	1.17 [0.76-1.80]	0.824	1.04 [0.72-1.50]	0.795
Number of children under 5 >1	933	653	70 [65.3-74.7]	2.3	1	1 [0.68-1.48]	0.728	0.91 [0.52-1.59]	0.966	1.01 [0.70-1.45]	0.762
Household displaced by insecurity	920	477	51.8 [43.2-60.5]	6.4	0.014	1.48 [1.09-2.01]	0.249	1.37 [0.79-2.39]	0.007	1.52 [1.14-2.04]	0.645
Household displaced by drought	920	357	38.8 [30.4-47.2]	6.4	0.05	0.73 [0.53-1.00]	0.617	0.87 [0.50-1.52]	0.045	0.74 [0.55-0.99]	0.527
Household displaced by eviction	920	11	1.2 [0-2.4]	2.6	0.233	0.31 [0.04-2.24]	0.879	1.16 [0.16-8.40]	0.188	0.27 [0.04-1.98]	0.286
Household displaced by conflict	920	64	7 [1.7-12.2]	9.3	0.324	0.71 [0.35-1.43]	0.084	0.34 [0.10-1.17]	0.267	0.69 [0.36-1.35]	0.350
Household displaced by flood /fire	920	2	0.2 [-0.1-0.5]	1	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Household displaced by loss of livelihood	920	7	0.8 [0-1.5]	1.7	0.044	3.77 [1.04-13.66]	.	1 [1.00-1.00]	0.066	3.32 [0.92-12.02]	0.427
Household displaced by other reasons	920	2	0.2 [-0.2-0.7]	2.1	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Primary occupation: Casual labor	933	274	29.4 [25.3-33.4]	1.7	0.959	0.99 [0.70-1.41]	0.112	1.37 [0.92-2.03]	0.709	1.07 [0.75-1.52]	0.500
Primary occupation: self employed	933	137	14.7 [10.4-19]	3.3	0.701	0.91 [0.56-1.48]	0.612	1.16 [0.64-2.09]	0.862	0.96 [0.62-1.49]	0.814
Primary occupation: petty trade	933	111	11.9 [9.2-14.6]	1.5	0.681	0.9 [0.53-1.53]	0.713	0.91 [0.54-1.54]	0.575	0.88 [0.56-1.39]	0.430
Primary occupation: other trade	933	37	4 [2.4-5.5]	1.4	0.281	0.57 [0.20-1.63]	0.492	0.63 [0.16-2.45]	0.227	0.61 [0.27-1.39]	0.601
Primary occupation: skilled trade	933	19	2 [0.7-3.4]	2.1	0.09	1.89 [0.90-3.98]	0.791	0.75 [0.08-6.73]	0.039	2.2 [1.05-4.64]	0.163
Low wage (2/3 of mean wage per person per day)	460	366	79.6 [71.9-87.2]	3.9	0.831	0.94 [0.50-1.76]	0.816	1.12 [0.41-3.10]	0.911	0.97 [0.52-1.79]	0.522
Income from: Sales Of Camel And Cattle	465	5	1.1 [-0.2-2.3]	1.6	0.004	3.99 [1.63-9.79]	.	1 [1.00-1.00]	0.008	3.46 [1.42-8.41]	.
Income from: Livestock Sale (Sheep/Goat)	465	54	11.6 [4.7-18.5]	5.1	0.599	0.8 [0.34-1.88]	0.553	1.21 [0.63-2.32]	0.521	0.77 [0.34-1.74]	0.046
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	465	1	0.2 [-0.2-0.7]	1	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Income from: Crop Sale	465	21	4.5 [1.6-7.4]	2.2	0.415	1.32 [0.66-2.64]	0.879	1.14 [0.20-6.42]	0.251	1.47 [0.75-2.88]	0.958
Income from: Petty Trade	465	5	1.1 [-0.5-2.6]	2.5	0	3.99 [2.18-7.30]	.	1 [1.00-1.00]	0	3.46 [1.89-6.34]	0.382

Income from: Other Trade (Specify):	465	124	26.7 [21.5-31.8]	1.5	0.412	0.82 [0.49-1.35]	0.158	0.63 [0.33-1.21]	0.237	0.77 [0.49-1.20]	0.232
Income from: Casual Labour Wage (Portage, Construction, Etc.)	465	203	43.7 [35.5-51.8]	3	0.345	0.8 [0.49-1.30]	0.698	0.89 [0.48-1.66]	0.519	0.87 [0.55-1.36]	0.794
Income from: Casual Labour Wage (Farm Labour)	465	84	18.1 [12.4-23.7]	2.4	0.353	1.23 [0.78-1.93]	0.218	1.66 [0.73-3.77]	0.25	1.29 [0.83-1.99]	0.812
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	465	165	35.5 [25.9-45]	4.4	0.466	1.2 [0.72-2.01]	0.95	1.02 [0.54-1.93]	0.66	1.12 [0.66-1.91]	0.971
Income from: Skilled/Salary Work	465	17	3.7 [1.5-5.8]	1.4	0.23	0.39 [0.08-1.88]	0.673	0.64 [0.07-5.57]	0.377	0.56 [0.15-2.13]	0.497
Income from: Remittance	465	3	0.6 [-0.1-1.4]	0.9	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	0.397
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	465	66	14.2 [6-22.4]	6.1	0.702	1.13 [0.60-2.14]	0.036	2.11 [1.06-4.22]	0.563	1.16 [0.69-1.93]	0.039
Income from: Humanitarian Assistance (Cash)	465	87	18.7 [9.6-27.8]	5.9	0.055	0.61 [0.37-1.01]	0.976	0.99 [0.49-2.00]	0.025	0.56 [0.34-0.93]	0.961
Income from: Productive Asset Sale	465	2	0.4 [-0.2-1]	0.9	0.51	2.62 [0.13-51.13]	.	1 [1.00-1.00]	0.572	2.28 [0.12-43.95]	.
Income from: Other Asset Sale	465	1	0.2 [-0.2-0.7]	1	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Income from: Other Source of Cash Income	0	0			.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Has assets: any animals	465	16	3.4 [0.6-6.3]	2.7	0.873	1.16 [0.17-7.90]	0.769	0.75 [0.11-5.36]	0.994	1.01 [0.15-6.85]	0.632
Has assets: sheepgoat	468	132	28.3 [19.9-36.7]	3.8	0.377	1.27 [0.74-2.18]	0.378	0.78 [0.44-1.38]	0.445	1.23 [0.71-2.11]	0.734
Has assets: donkey	470	103	21.9 [13.6-30.2]	4.4	0.709	1.11 [0.63-1.94]	0.742	0.92 [0.55-1.54]	0.653	1.12 [0.67-1.89]	0.506
Has assets: chicken	470	181	38.5 [29.8-47.3]	3.6	0.998	1 [0.62-1.61]	0.979	1.01 [0.57-1.79]	0.772	1.07 [0.66-1.75]	0.996
Has assets: land	470	221	47 [36.2-57.9]	5.2	0.888	0.97 [0.64-1.47]	0.081	0.61 [0.34-1.07]	0.96	0.99 [0.69-1.42]	0.822
Has assets: house	470	437	93 [89.4-96.5]	2.1	0.593	0.85 [0.45-1.59]	0.54	1.51 [0.39-5.89]	0.541	0.83 [0.45-1.54]	0.741
Has assets: radio	470	157	33.4 [21-45.8]	7.6	0.41	1.2 [0.77-1.86]	0.983	0.99 [0.47-2.10]	0.57	1.13 [0.74-1.72]	0.686
Has assets: bike	470	11	2.4 [0.7-4]	1.2	0.946	0.96 [0.32-2.91]	.	1 [1.00-1.00]	0.74	0.84 [0.28-2.50]	.
Has assets: phone	468	352	75.3 [68.2-82.4]	3	0.946	1.02 [0.63-1.64]	0.647	1.25 [0.46-3.40]	0.606	1.15 [0.67-1.96]	0.130
Has assets: agtools	470	45	9.5 [4.9-14.2]	2.8	0.961	1.01 [0.59-1.75]	0.718	1.21 [0.42-3.49]	0.943	0.98 [0.58-1.66]	0.280
Has assets: skwtools	462	14	3 [0.4-5.5]	2.5	0.744	0.86 [0.33-2.21]	.	1 [1.00-1.00]	0.529	0.75 [0.29-1.92]	0.410
Has assets: cart	470	72	15.4 [7.8-22.9]	4.8	0.977	1.01 [0.45-2.30]	0.411	1.35 [0.64-2.83]	0.609	1.21 [0.56-2.63]	0.671
Has assets: wheelbarrow	469	24	5.1 [2.1-8.2]	2.1	0.227	1.71 [0.70-4.16]	0.845	0.86 [0.18-4.04]	0.389	1.47 [0.59-3.66]	0.155
Spends over 80% of earnings on food	468	96	20.6 [14.5-26.7]	2.4	0.196	1.41 [0.83-2.41]	0.355	1.41 [0.66-3.02]	0.406	1.26 [0.72-2.20]	0.298
Has savings	456	4	0.9 [-0.4-2.1]	1.9	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	0.720
Received humanitarian cereal food assistance	454	121	26.7 [14.3-39.1]	8.5	0.744	1.1 [0.61-1.99]	0.736	1.15 [0.50-2.61]	0.954	1.02 [0.56-1.85]	0.645
Household had no money or food <30 days	460	186	40.4 [30.7-50.2]	4.2	0.76	0.92 [0.51-1.64]	0.247	0.65 [0.30-1.38]	0.603	0.86 [0.47-1.56]	0.513
Cereal means other than cash	455	105	23 [13.4-32.6]	5.7	0.531	0.85 [0.50-1.45]	0.322	0.52 [0.13-1.98]	0.323	0.76 [0.43-1.33]	0.558
Cereal means other than cash	465	76	16.3 [10.2-22.5]	3	0.808	0.95 [0.62-1.46]	0.785	0.87 [0.29-2.55]	0.592	0.88 [0.54-1.43]	0.538

Child was breastfed	465	220	47.4 [41.8-52.9]	0.9	0.593	0.85 [0.46-1.57]	0.018	2.38 [1.18-4.80]	0.403	1.31 [0.68-2.50]	0.470
Child was breastfed until 2 years	302	36	11.9 [1.6-22.3]	1.6	0.725	0.78 [0.19-3.20]	0.126	4.58 [0.63-33.19]	0.686	1.3 [0.35-4.87]	0.518
Child was breastfed until 1 yeras	67	37	55.1 [36.3-73.9]	1.6	0.268	2.33 [0.49-11.06]	0.657	1.44 [0.26-7.84]	0.364	1.8 [0.48-6.78]	0.541
Early introduction of complementary foods (< 6 months)	49	7	14.3 [7.4-21.3]	2	0.771	0.86 [0.29-2.51]	0.594	1.25 [0.54-2.91]	0.766	0.89 [0.42-1.92]	0.133
Introduction to complementary foods: 6-8 months	223	151	67.7 [60.6-74.8]	1.2	0.612	0.86 [0.48-1.56]	0.812	0.94 [0.57-1.56]	0.373	0.83 [0.54-1.27]	0.289
Child is currently breasfed	223	106	47.4 [41.8-52.9]	0.9	0.593	0.85 [0.46-1.57]	0.018	2.38 [1.18-4.80]	0.403	1.31 [0.68-2.50]	0.470
Received Vitamin A in last six months	302	75	24.8 [16.4-33.2]	7.8	0.449	0.86 [0.58-1.28]	0.08	1.59 [0.94-2.67]	0.77	0.95 [0.66-1.36]	0.157
Received measles vaccination in last six months	868	311	35.8 [27.2-44.5]	6.6	0.619	1.09 [0.77-1.55]	0.85	0.95 [0.52-1.72]	0.493	1.12 [0.80-1.59]	0.138
Received polio vaccination in last six months	868	868	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
Diarrhea in last 2 weeks	868	57	6.6 [3.4-9.8]	3.4	0.212	1.23 [0.88-1.71]	0	8.18 [4.11-16.27]	0.01	1.99 [1.20-3.32]	0.004
Pneumonia in last 2 weeks	868	57	6.6 [3.4-9.8]	3.4	0.212	1.23 [0.88-1.71]	0	8.18 [4.11-16.27]	0.01	1.99 [1.20-3.32]	0.004
fever in last 2 weeks	868	178	20.5 [14.8-26.2]	4.1	0.064	1.47 [0.98-2.22]	0.008	2.24 [1.26-3.96]	0.032	1.58 [1.04-2.39]	0.752
measles in last 2 weeks	868	17	2 [-0.2-4.2]	5.2	0.274	1.99 [0.56-7.10]	0.368	1.42 [0.65-3.13]	0.37	1.76 [0.49-6.25]	0.644
morbidity in last two weeks	868	252	29 [22.9-35.2]	3.7	0.014	1.57 [1.10-2.24]	0.001	2.78 [1.58-4.89]	0.009	1.66 [1.15-2.42]	0.967
child registered at feeding programme	868	868	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
HDD: Cereals in last 24 hr	14	14	100 [100-100]	0	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
HDD: White Roots And Tubers in last 24 hr	465	40	8.6 [4.1-13.1]	2.8	0.829	1.1 [0.43-2.80]	0.107	1.82 [0.87-3.79]	0.324	1.41 [0.70-2.88]	0.559
HDD: Vitamin A Rich Vegetables in last 24 hr	465	46	9.9 [4.5-15.3]	3.6	0.922	1.04 [0.47-2.28]	0.902	0.95 [0.41-2.21]	0.764	0.89 [0.40-1.97]	0.363
HDD: Dark Green Leafy Vegetables in last 24 hr	465	32	6.9 [3.1-10.7]	2.5	0.624	1.25 [0.49-3.20]	0.491	0.61 [0.14-2.64]	0.869	1.08 [0.43-2.71]	0.095
HDD: Other Vegetables in last 24 hr	465	121	26 [18.2-33.9]	3.5	0.743	1.09 [0.63-1.91]	0.278	1.53 [0.70-3.35]	0.734	1.09 [0.66-1.77]	0.949
HDD: Vitamin A Rich Fruits in last 24 hr	465	15	3.2 [0.2-6.2]	3.2	0.329	0.7 [0.33-1.47]	0.674	0.69 [0.11-4.15]	0.177	0.6 [0.29-1.27]	0.730
HDD: Other Fruits in last 24 hr	465	23	4.9 [1-8.9]	3.7	0.111	0.42 [0.14-1.24]	0.425	0.44 [0.05-3.53]	0.055	0.51 [0.26-1.02]	0.024
HDD: Organ Meat in last 24 hr	465	15	3.2 [0.5-5.9]	2.5	0.044	0.19 [0.04-0.95]	0.637	0.69 [0.14-3.41]	0.031	0.17 [0.03-0.84]	0.145
HDD: Flesh Meats in last 24 hr	465	43	9.2 [5.5-13]	1.8	0.143	0.46 [0.16-1.33]	0.7	0.74 [0.15-3.69]	0.129	0.48 [0.18-1.26]	0.631
HDD: Eggs in last 24 hr	465	21	4.5 [1-8]	3.1	0.088	2.02 [0.89-4.57]	0.942	0.95 [0.24-3.71]	0.178	1.74 [0.76-3.96]	0.939
HDD: Fish And Seafood in last 24 hr	465	9	1.9 [0.5-3.3]	1.1	0.666	1.3 [0.38-4.50]	.	1 [1.00-1.00]	0.845	1.13 [0.32-3.96]	0.189
HDD: Legumes, Nuts And Seeds in last 24 hr	465	272	58.5 [49-68]	4	0.945	0.98 [0.62-1.56]	0.166	0.61 [0.30-1.25]	0.394	0.82 [0.50-1.32]	0.502
HDD: Milk And Milk Products	465	261	56.1 [44.4-67.9]	6.2	0.334	1.22 [0.81-1.84]	0.899	0.95 [0.45-2.01]	0.59	1.11 [0.75-1.66]	0.458
HDD: Oils And Fats	465	419	90.1 [85.4-94.9]	2.8	0.537	0.82 [0.42-1.59]	0.081	0.49 [0.22-1.10]	0.144	0.67 [0.38-1.16]	0.818
HDD: Sweets	465	434	93.3 [90-96.6]	1.9	0.48	0.68 [0.22-2.08]	0.919	0.95 [0.36-2.54]	0.66	0.79 [0.26-2.39]	0.926
HDD: Spices, Condiments, Beverages	465	394	84.7 [78.7-90.7]	3.1	0.737	0.89 [0.45-1.79]	0.446	0.79 [0.43-1.47]	0.527	0.82 [0.44-1.54]	0.677
HDD: Any veg	465	164	35.3 [24.9-45.7]	5.1	0.801	1.07 [0.62-1.85]	0.658	1.16 [0.59-2.30]	0.988	1 [0.59-1.71]	0.315

HDD: Any fruit	465	34	7.3 [2.5-12.1]	3.7	0.052	0.47 [0.22-1.01]	0.429	0.61 [0.17-2.18]	0.02	0.52 [0.30-0.89]	0.585
HDD: Any meat	465	54	11.6 [7.8-15.4]	1.6	0.066	0.41 [0.15-1.07]	0.708	0.79 [0.21-2.91]	0.051	0.41 [0.17-1.01]	0.952
HDD: Four+ food groups in last 7 days	465	213	45.1 [50-58.3]	1.5	0.554	1.12[0.76-1.64]	1.29	1.29 [0.84-1.98]	1.13	1.13 [0.79-1.61]	0.696
HDD: Four+ food groups in last 7 dayless than mean score	450	235	45.9 [41.7-50]	1.5	0.374	0.86[0.60-1.22]	0.203	0.76 [0.49-1.17]	0.297	0.83 [0.57-1.19]	0.497
IDD: Cereals, roots and tubers	450	423	93.9 [90.7-97.1]	2.8	0.872	0.93 [0.37-2.33]	0.001	0.18 [0.07-0.45]	0.09	0.58 [0.31-1.10]	0.000
IDD: Legumes,nutsandseeds	933	350	37.5 [27.1-47.9]	1.7	0.855	0.96 [0.58-1.57]	0.054	0.54 [0.29-1.01]	0.331	0.78 [0.47-1.31]	0.956
IDD: Milk and milk products	933	731	78.4 [71.1-85.7]	6.6	0.57	0.83 [0.42-1.62]	0.173	1.66 [0.79-3.49]	0.788	0.92 [0.50-1.69]	0.237
IDD: Flesh (meat,fishandpoultry) products	378	5	1.3 [-0.2-2.9]	2.2	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
IDD: Eggs	373	32	8.6 [0.9-16.3]	3.4	0.307	0.8 [0.51-1.25]	0.09	1.7 [0.92-3.14]	0.73	1.09 [0.67-1.77]	0.421
IDD: Vitamin A	380	5	1.3 [-0.5-3.2]	2	0.573	0.69 [0.18-2.62]	.	1 [1.00-1.00]	0.383	0.56 [0.15-2.14]	.
IDD: Other fruits and vegetables	373	15	4 [0.1-7.9]	2.2	0.545	1.4 [0.45-4.28]	0.49	0.49 [0.06-4.04]	0.826	1.13 [0.37-3.43]	0.885
IDD: Over mean IDDS	662	468	70.7 [65.5-75.9]	3.4	0.131	0.74 [0.50-1.10]	0.009	0.5 [0.31-0.83]	0.07	0.68 [0.44-1.04]	0.902
IDD: Yesterday: Vitamin A	373	5	1.3 [-0.5-3.2]	2.8	0.573	0.69 [0.18-2.62]	.	1 [1.00-1.00]	0.383	0.56 [0.15-2.14]	.
IDD: other veg	374	15	4 [0.1-7.9]	4	0.545	1.4 [0.45-4.28]	0.49	0.49 [0.06-4.04]	0.826	1.13 [0.37-3.43]	0.885
IDD: Milk and milk products	380	298	78.4 [71.1-85.7]	1.7	0.57	0.83 [0.42-1.62]	0.173	1.66 [0.79-3.49]	0.788	0.92 [0.50-1.69]	0.237
IDD: Legumes,nutsandseeds	373	140	37.5 [27.1-47.9]	6.6	0.855	0.96 [0.58-1.57]	0.054	0.54 [0.29-1.01]	0.331	0.78 [0.47-1.31]	0.956
IDD: Fish	373	5	1.3 [-0.2-2.9]	1.6	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.	1 [1.00-1.00]	.
IDD: Eggs	373	32	8.6 [0.9-16.3]	6.2	0.307	0.8 [0.51-1.25]	0.09	1.7 [0.92-3.14]	0.73	1.09 [0.67-1.77]	0.421
IDD: Cereals, roots and tubers	378	355	93.9 [90.7-97.1]	4.1	0.872	0.93 [0.37-2.33]	0.001	0.18 [0.07-0.45]	0.09	0.58 [0.31-1.10]	0.000
Unprotected source of drinking water	463	28	6 [0.4-11.7]	2.5	0.724	0.81 [0.25-2.67]	0.898	1.14 [0.15-8.92]	0.545	0.7 [0.21-2.30]	0.672
Unimproved toilet	463	33	7.1[2.7-17.5]	7.4	0.17	1.6 [.79 - 3.5]	0.159	2.36 [.7 - 7.9]	0.322	1.4 [.69 - 2.9]	0.487
Mother any education	801	87	10.9 [6.3-15.4]	4.1	0.714	0.91 [0.53-1.55]	0.588	1.25 [0.54-2.88]	0.895	0.96 [0.52-1.79]	0.390
Mother slept under a mosquito net last night	799	701	87.7 [84-91.5]	2.5	0.822	1.06 [0.61-1.84]	0.681	0.82 [0.30-2.22]	0.69	0.92 [0.58-1.44]	0.783
Past 7 days: Shifted to less preferred (low quality, less expensive) foods	286	176	61.5 [48.9-74.2]	4.5	0.823	1.08 [0.54]-[2.17]	0.864	0.94 [0.46]-[1.94]	0.866	1.05 [0.57]-[1.94]	0.356
Past 7 days: Limited the portion/quantity consumed in a meal	282	52	18.4 [11.4-25.5]	2.2	0.366	1.47 [0.62]-[3.48]	0.446	0.71 [0.29]-[1.77]	0.441	1.32 [0.64]-[2.72]	0.557
Past 7 days: Took fewer numbers of meals in a day	282	98	34.8 [23.7-45.8]	3.5	0.713	0.88 [0.43]-[1.80]	0.328	0.62 [0.23]-[1.66]	0.796	0.92 [0.46]-[1.83]	0.821
Past 7 days: Borrowed food on credit from the shop/market	284	190	66.9 [55.9-77.9]	3.6	0.413	0.79 [0.43]-[1.43]	0.222	0.55 [0.21]-[1.47]	0.27	0.71 [0.37]-[1.34]	0.644

Past 7 days: Borrowed food on credit from another household (Amaah)?	281	132	47 [37.4-56.5]	2.4	0.912	1.03 [0.60]-[1.76]	0.797	1.12 [0.45]-[2.77]	0.499	1.2 [0.70]-[2.06]	0.535	
Past 7 days: Restricted consumption of adults for small children to eat?	281	46	16.4 [8.6-24.2]	2.9	0.564	1.26 [0.55]-[2.88]	0.642	0.75 [0.22]-[2.62]	0.758	1.14 [0.47]-[2.79]	0.301	
Past 7 days: Relied on food donations from relatives	282	62	22 [14.7-29.2]	2	0.6	0.86 [0.48]-[1.55]	0.93	0.96 [0.41]-[2.28]	0.815	0.93 [0.48]-[1.78]	0.528	
Past 7 days: Relied on food donations from the clan/community	282	49	17.4 [10.3-24.4]	2.3	0.538	0.76 [0.31]-[1.88]	0.829	0.9 [0.32]-[2.50]	0.815	0.91 [0.41]-[2.02]	0.076	
Past 7 days: Sought or rely on food aid from humanitarian agency	282	18	6.4 [2.3-10.5]	1.8	0.499	0.72 [0.27]-[1.94]	0.391	0.45 [0.07]-[2.99]	0.681	0.82 [0.30]-[2.23]	0.235	
Past 7 days: Sent household members to eat elsewhere	281	18	6.4 [1.2-11.6]	2.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.277	
Past 7 days: Begged for food	280	6	2.1 [-0.6-4.9]	2.3	0.57	0.47 [0.03]-[7.14]	.	1 [1.00]-[1.00]	0.481	0.39 [0.03]-[5.99]	0.729	
Past 7 days: Skipped entire days without eating	279	11	3.9 [0.5-7.3]	2	0.036	3.32 [1.09]-[10.15]	0.346	2.57 [0.34]-[19.63]	0.076	2.73 [0.89]-[8.37]	0.027	

Table 31: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Gu season, 2017 (FSNAU)

Risk factor _Logistic Regression_	N	n	Proportion in analyzed sample [95% CI]	Design effect	Wasting (W/H) _Children 6-59 months_		Wasting (MUAC) _Children 6-59 months_		Wasting by MUAC and/or W/H _Children 6-59 months_		
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value
Male child	623	332	53.3 [48.9-57.7]	1.1	0.978	0.99 [0.57]-[1.73]	0.037	0.57 [0.34]-[0.96]	0.499	0.84 [0.51]-[1.40]	0.0
Main provider female	533	129	24.2 [17.3-31.2]	3.3	0.738	1.14 [0.53]-[2.45]	0.41	1.45 [0.58]-[3.58]	0.602	1.19 [0.61]-[2.31]	0.8
Household head female	529	124	23.4 [16.2-30.6]	3.6	0.439	1.3 [0.65]-[2.59]	0.983	1.01 [0.33]-[3.13]	0.483	1.24 [0.66]-[2.32]	0.9
Age group -<24 months	623	243	39 [35.2-42.9]	0.9	0.335	0.84 [0.58]-[1.21]	0	8.97 [3.36]-[23.90]	0.062	1.4 [0.98]-[2.01]	0.0
Age group -<36 months	623	400	64 [60.1-68.1]	1.2	0.022	0.56 [0.35]-[0.91]	0.002	7.92 [2.34]-[26.71]	0.424	.85 [0.57]-[1.28]	0
Above average household size (> =6 members)	779		497	0.87	0.11	.70 [0.46]-[1.08]	0.308	1.35 [0.74]-[2.47]	0.269	.80 [0.53]-[1.2]	0.0
Number of children under 5 >1	779	281	36.1 [32.7-39.5]	0.9	0.441	0.85 [0.55]-[1.31]	0.006	0.21 [0.07]-[0.62]	0.049	0.64 [0.41]-[1.00]	0.3
Household displaced by insecurity	533	145	27.2 [14-40.4]	11.1	0.116	0.62 [0.34]-[1.13]	.	1 [1.00]-[1.00]	0.058	0.55 [0.29]-[1.02]	0.2
Household displaced by drought	533	279	52.3 [39.8-64.9]	8	0.526	1.19 [0.68]-[2.06]	0.044	10.18 [1.07]-[97.11]	0.181	1.41 [0.84]-[2.35]	0.7
Household displaced by eviction	533	14	2.6 [0.4-4.9]	2.5	0.452	1.73 [0.39]-[7.62]	.	1 [1.00]-[1.00]	0.552	1.56 [0.34]-[7.14]	.
Household displaced by conflict	533	44	8.3 [3.3-13.3]	4.2	0.534	0.76 [0.31]-[1.87]	.	1 [1.00]-[1.00]	0.372	0.68 [0.28]-[1.63]	0.4
Household displaced by flood /fire	533	5	0.9 [-0.3-2.2]	2.1	0.051	4.38 [0.99]-[19.29]	.	1 [1.00]-[1.00]	0.06	3.95 [0.94]-[16.55]	.
Household displaced by loss of livelihood	533	46	8.6 [2.6-14.7]	5.8	0.434	1.4 [0.59]-[3.36]	0.976	0.97 [0.11]-[8.40]	0.59	1.25 [0.53]-[2.94]	0.9
Household displaced by other reasons	533	0		0.1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Primary occupation: Casual labor	779		24.1 [21.9-26.2]	0.2	0.537	1.17[0.70]-[1.96]	0.086	0.42[0.16]-[1.14]	0.963	0.99[0.61]-[1.59]	0.3
Primary occupation: self employed	779	57	7.3 [5.2-10.2]	0.46	0.319	0.59[0.20]-[1.72]	0.76	0.8[0.19]-[3.43]	0.363	0.6[0.19]-[1.86]	0.3
Primary occupation: petty trade	779	48	06.2 [4.2-9.0]	1.7	0.148	0.36[0.09]-[1.47]	.	1[1.00]-[1.00]	0.076	0.28[0.07]-[1.15]	0.9
Primary occupation: other trade	779	5	.6 [0.02-0.2]	1.2	.	1[1.00]-[1.00]	.	1[1.00]-[1.00]	.	1[1.00]-[1.00]	0.4
Primary occupation: skilled trade	779	10	1.1 [0.7-2.3]	1.2	.	1[1.00]-[1.00]	.	1[1.00]-[1.00]	.	1[1.00]-[1.00]	0.2
Low wage (2/3 of mean wage per person per day)	281	100	35.6 [28.2-43]	1.9	0.068	2.09 [0.94]-[4.62]	0.83	1.22 [0.18]-[8.16]	0.129	1.8 [0.83]-[3.90]	0.3
Income from: Sales Of Camel And Cattle	283	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Livestock Sale (Sheep/Goat)	283	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	283	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Crop Sale	283	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.

Income from: Petty Trade	283	49	17.3 [10.9-23.7]	1.9	0.437	0.55 [0.11]-[2.63]	.	1 [1.00]-[1.00]	0.378	0.5 [0.10]-[2.45]	0.5
Income from: Other Trade (Specify):	283	3	1.1 [-0.2-2.3]	0.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.3
Income from: Casual Labour Wage (Portage, Construction, Etc.)	283	162	57.2 [51.5-63]	0.9	0.01	2.39 [1.25]-[4.55]	0.88	1.16 [0.17]-[8.10]	0.013	2.21 [1.20]-[4.09]	0.4
Income from: Casual Labour Wage (Farm Labour)	283	30	10.6 [6-15.2]	1.5	0.125	0.19 [0.02]-[1.64]	0.701	1.6 [0.13]-[19.10]	0.229	0.38 [0.07]-[1.91]	0.8
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	283	56	19.8 [13.4-26.2]	1.7	0.303	0.57 [0.19]-[1.70]	0.311	2.77 [0.37]-[20.89]	0.567	0.71 [0.21]-[2.40]	0.2
Income from: Skilled/Salary Work	283	8	2.8 [0.8-4.9]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.
Income from: Remittance	283	2	0.7 [-0.7-2.2]	2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	283	14	4.9 [1.6-8.3]	1.6	0.224	2.58 [0.54]-[12.25]	.	1 [1.00]-[1.00]	0.268	2.36 [0.50]-[11.17]	0.8
Income from: Humanitarian Assistance (Cash)	283	8	2.8 [0.3-5.4]	1.6	0.885	1.19 [0.10]-[13.53]	.	1 [1.00]-[1.00]	0.938	1.1 [0.10]-[12.43]	.
Income from: Productive Asset Sale	283	1	0.4 [-0.4-1.1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Other Asset Sale	283	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Other Source of Cash Income	283	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Has assets: any animals	280	7	2.5 [0-5]	1.7	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Has assets: sheepgoat	281	50	17.8 [9-26.6]	3.5	0.949	1.03 [0.35]-[3.04]	.	1 [1.00]-[1.00]	0.905	0.94 [0.34]-[2.61]	0.5
Has assets: donkey	280	41	14.6 [8.6-20.7]	1.9	0.506	1.47 [0.45]-[4.76]	0.116	5 [0.65]-[38.29]	0.596	1.34 [0.44]-[4.10]	.
Has assets: chicken	281	59	21 [13-29]	2.6	0.639	1.3 [0.42]-[3.98]	1	1 [0.08]-[12.41]	0.776	1.17 [0.38]-[3.63]	0.2
Has assets: land	281	174	61.9 [50.5-73.4]	3.7	0.887	0.95 [0.44]-[2.02]	0.98	0.98 [0.13]-[7.11]	0.809	0.92 [0.45]-[1.89]	0.7
Has assets: house	281	249	88.6 [79.1-98.1]	5.9	0.614	0.73 [0.20]-[2.64]	.	1 [1.00]-[1.00]	0.718	0.8 [0.22]-[2.86]	0.8
Has assets: radio											
Has assets: bike	281	22	7.8 [3.5-12.2]	1.7	0.324	0.34 [0.04]-[3.06]	.	1 [1.00]-[1.00]	0.288	0.32 [0.04]-[2.81]	0.8
Has assets: phone	281	211	75.1 [67-83.2]	2.3	0.039	9.13 [1.12]-[74.27]	.	1 [1.00]-[1.00]	0.034	9.94 [1.21]-[81.53]	0.6
Sell household assets/goods	63	25	39.7 [18-61.4]	2.7	0.735	1.31 [0.24]-[7.08]	.	1 [1.00]-[1.00]	0.381	1.87 [0.42]-[8.20]	0.3
Purchase food on credit or borrowed food	135	123	91.1 [84.3-97.9]	1.8	0.787	0.81 [0.16]-[4.12]	0.117	0.08 [0.00]-[2.00]	0.787	0.81 [0.16]-[4.12]	.
Withdrew children from madrassa school	19	16	84.2 [64-104.4]	1.2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Sell house or land	28	18	64.3 [45.9-82.7]	0.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.7
Beg at the mosque for food or money to buy food	10	9	90 [65.5-114.5]	1.1	.	1 [1.00]-[1.00]	0.638	0.85 [0.41]-[1.73]	.	1 [1.00]-[1.00]	.
Sell last breeding animals	16	10	62.5 [20.5-104.5]	2	.	1 [1.00]-[1.00]	0.432	0.8 [0.46]-[1.41]	.	1 [1.00]-[1.00]	.
no food or no money for food in past 7 days	101	0		0	.	1 [1.00]-[1.00]	0.965	1.01 [0.52]-[1.97]	.	1 [1.00]-[1.00]	.
Received Vitamin A in last six months	623	464	74.5 [62.9-86.1]	10.5	0.627	1.09 [0.76]-[1.56]	0.002	4.88 [1.87]-[12.68]	0.923	1.01 [0.75]-[1.38]	0.3

Received measles vaccination in last six months	623	358	57.5 [44.1-70.8]	10.8	0.526	0.89 [0.60]-[1.30]	0.22	2.05 [0.63]-[6.60]	0.443	0.89 [0.65]-[1.21]	0.0
Received polio vaccination	623	518	83.1 [73.8-92.5]	9.3	0.2	0.81 [0.59]-[1.12]	0.004	5.47 [1.82]-[16.43]	0.191	0.83 [0.62]-[1.10]	0.7
Diarrhoea in last 2 weeks	623	45	7.2 [4.1-10.3]	2.1	0.007	2.28 [1.28]-[4.08]	.	1 [1.00]-[1.00]	0.005	2.98 [1.43]-[6.23]	0.3
Pneumonia in last 2 weeks	623	41	6.6 [3.5-9.7]	2.4	0.449	1.35 [0.61]-[2.98]	0.018	2.87 [1.21]-[6.81]	0.164	1.58 [0.82]-[3.04]	0.5
Fever in last 2 weeks	623	19	3 [1.5-4.6]	1.2	0.599	1.26 [0.52]-[3.06]	.	1 [1.00]-[1.00]	0.073	2.22 [0.92]-[5.31]	0.7
measles in last 2 weeks	623	3	0.5 [-0.1-1]	0.9	0.488	2.36 [0.19]-[28.74]	0.02	0.02 [0.00]-[0.53]	0.623	1.85 [0.15]-[23.47]	0.1
morbidity in last two weeks	623	83	13.3 [8.8-17.8]	2.6	0.424	1.25 [0.72]-[2.17]	.	1 [1.00]-[1.00]	0.108	1.61 [0.89]-[2.91]	0.4
HDD: Cereals in last 24 hr	272	271	99.6 [98.9-100.4]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: White Roots And Tubers in last 24 hr	271	3	1.1 [-0.1-2.4]	0.9	0.289	0.21 [0.01]-[4.11]	.	1 [1.00]-[1.00]	0.314	0.22 [0.01]-[4.44]	
HDD: Vitamin A Rich Vegetables in last 24 hr	272	3	1.1 [-0.5-2.7]	1.6	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: Dark Green Leafy Vegetables in last 24 hr	272	23	8.5 [3.8-13.1]	1.8	0.403	1.9 [0.40]-[9.02]	.	1 [1.00]-[1.00]	0.35	2.07 [0.43]-[10.00]	0.9
HDD: Other Vegetables in last 24 hr	272	136	50 [40.9-59.1]	2.1	0.409	1.42 [0.60]-[3.38]	.	1 [1.00]-[1.00]	0.236	1.64 [0.71]-[3.78]	0.8
HDD: Vitamin A Rich Fruits in last 24 hr	271	15	5.5 [1.9-9.2]	1.6	.	1 [1.00]-[1.00]	0.45	0.39 [0.03]-[4.87]	.	1 [1.00]-[1.00]	0.9
HDD: Other Fruits in last 24 hr	272	11	4 [0.8-7.3]	1.8	0.885	0.84 [0.07]-[9.65]	.	1 [1.00]-[1.00]	0.939	0.91 [0.08]-[10.58]	0.0
HDD: Organ Meat in last 24 hr	272	7	2.6 [0.2-4.9]	1.4	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	
HDD: Flesh Meats in last 24 hr	271	31	11.4 [6.4-16.5]	1.6	0.373	0.6 [0.19]-[1.89]	0.486	0.53 [0.08]-[3.38]	0.471	0.66 [0.21]-[2.11]	.
HDD: Eggs in last 24 hr	271	8	3 [0.1-5.8]	1.8	.	1 [1.00]-[1.00]	0.299	2.82 [0.38]-[21.03]	.	1 [1.00]-[1.00]	0.6
HDD: Fish And Seafood in last 24 hr	270	4	1.5 [0.1-2.9]	0.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	
HDD: Legumes, Nuts And Seeds in last 24 hr	271	80	29.5 [17.7-41.3]	4.3	0.227	1.58 [0.74]-[3.40]	0.952	0.93 [0.08]-[10.59]	0.301	1.39 [0.73]-[2.65]	0.6
HDD: Milk And Milk Products	272	180	66.2 [55.8-76.5]	3.1	0.498	1.31 [0.59]-[2.89]	.	1 [1.00]-[1.00]	0.217	1.59 [0.75]-[3.37]	0.8
HDD: Oils And Fats	272	268	98.5 [97.1-99.9]	0.9	0.499	2.41 [0.17]-[33.87]	.	1 [1.00]-[1.00]	0.538	2.23 [0.16]-[30.99]	.
HDD: Sweets	272	224	82.4 [73-91.7]	3.9	0.768	1.14 [0.47]-[2.74]	.	1 [1.00]-[1.00]	0.952	1.03 [0.43]-[2.48]	0.9
HDD: Spices, Condiments, Beverages	272	250	91.9 [86.6-97.2]	2.4	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.5
HDD: Any veg	272	271	0.4 [-0.4-1.1]	1	.	1 [1.00]-[1.00]	0.014	0.33 [0.14]-[0.79]	.	1 [1.00]-[1.00]	.
HDD: Any fruit	272	267	1.8 [-0.3-4]	1.7	.	1 [1.00]-[1.00]	0.014	3.04 [1.27]-[7.25]	.	1 [1.00]-[1.00]	.
HDD: Any meat	272	271	0.4 [-0.4-1.1]	1	.	1 [1.00]-[1.00]	0.014	0.33 [0.14]-[0.78]	.	1 [1.00]-[1.00]	.
HDD: Four+ food groups in last 7 days	779	270	65.3 [63.9-66.8]	2	0.986	1 [0.59]-[1.67]	0.259	2.31 [0.52]-[10.29]	0.327	0.8 [0.51]-[1.27]	0.4
HDD: Four+ food groups in last 7 dayless than mean score	779	509	34.7 [33.2-36.1]	2	0.986	1 [0.60]-[1.68]	0.163	2.18 [0.72]-[6.64]	0.327	1.25 [0.79]-[1.98]	0.4
HDD: Any animal source foods	779	271	34.7 [33.2-36.1]	0.2	0.956	0.99 [0.59]-[1.65]			0.308	0.79 [0.50]-[1.26]	0.4
WASH: Main source of drinking water unprotected	390	49	65.2 [63.8-66.6]	5.7	0.4	0.67 [0.26]-[1.75]			0.755	0.88 [0.37]-[2.08]	0.0
WASH: Toilet used by most members of the household	389	112	28.8 [13.5-44.1]	10.6	0.227	1.43 [0.79]-[2.57]			0.135	1.54 [0.87]-[2.74]	0.0

Table 32: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Gu season, 2018 (FSNAU)

Risk factor *Logistic Regression*					Wasting (W/H) *Children 0-59 months*		Wasting (MUAC) Children 6-59 months[1]		Wasting by MUAC and/or W/H *Children 6-59 months*		*C...*
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value
Male child	626	337	53.8 [49-58.6]	1.4	0.241	1.36 [0.80]-[2.31]	0.005	0.51 [0.33]-[0.80]	0.721	1.09 [0.68]-[1.75]	0.035
Main provider female	626	105	16.8 [12.3-21.3]	2.2	0.472	1.26 [0.66]-[2.43]	0.464	1.3 [0.63]-[2.69]	0.624	1.15 [0.65]-[2.03]	0.885
Household head female	626	106	16.9 [13.1-20.7]	1.5	0.863	0.95 [0.49]-[1.82]	0.997	1 [0.49]-[2.03]	0.533	0.84 [0.47]-[1.50]	0.94
Age group -<24 months	626	215	34.3 [30.6-38.1]	0.9	0.842	1.06 [0.59]-[1.90]	0	22.08 [10.54]-[46.29]	0.009	2.09 [1.22]-[3.58]	0.077
Age group -<36 months	626	305	48.7 [40.9-56.5]	3.6	0.832	0.96 [0.68]-[1.37]	0.939	1.02 [0.62]-[1.69]	0.857	0.97 [0.71]-[1.33]	0.022
Number of children under 5 >1	626	390	62.3 [55.5-69.1]	2.9	0.868	0.97 [0.64]-[1.45]	0.047	1.7 [1.01]-[2.88]	0.422	1.15 [0.81]-[1.62]	0.071
Household displaced by insecurity	626	154	24.6 [18.2-31]	3.2	0.101	0.67 [0.41]-[1.09]	0.064	0.6 [0.35]-[1.03]	0.078	0.67 [0.43]-[1.05]	0.307
Household displaced by drought	626	437	69.8 [61.8-77.8]	4.5	0.218	1.34 [0.83]-[2.17]	0.025	1.78 [1.08]-[2.92]	0.153	1.39 [0.88]-[2.21]	0.072
Household displaced by eviction	626	5	0.8 [-0.4-2]	2.5	0.3	4.57 [0.24]-[87.56]	.	1 [1.00]-[1.00]	0.406	3.39 [0.17]-[66.21]	0.366
Household displaced by conflict	626	10	1.6 [0.1-3.1]	2.2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.228
Household displaced by flood /fire	626	4	0.6 [-0.4-1.7]	2.5	0.778	1.51 [0.08]-[29.16]	.	1 [1.00]-[1.00]	0.938	1.12 [0.06]-[21.76]	0.329
Household displaced by loss of livelihood	626	15	2.4 [-0.1-4.9]	4	0.478	1.66 [0.39]-[7.10]	0.465	1.5 [0.49]-[4.55]	0.463	1.71 [0.39]-[7.42]	0.094
Household displaced by other reasons	626	1	0.2 [-0.2-0.5]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Primary occupation: Casual labor	626	289	46.2 [41.6-50.7]	1.2	0.303	1.24 [0.81]-[1.88]	0.39	1.23 [0.76]-[2.00]	0.245	1.22 [0.87]-[1.72]	0.767
Primary occupation: self employed	626	279	44.6 [39.1-50]	1.8	0.467	1.17 [0.76]-[1.79]	0.376	1.23 [0.77]-[1.95]	0.351	1.18 [0.83]-[1.68]	0.874
Primary occupation: petty trade	626	271	43.3 [36.5-50.1]	2.8	0.142	1.35 [0.90]-[2.03]	0.116	1.4 [0.91]-[2.14]	0.065	1.35 [0.98]-[1.86]	0.944
Primary occupation: other trade	626	266	42.5 [35.2-49.7]	3.2	0.235	1.29 [0.84]-[1.97]	0.185	1.35 [0.86]-[2.11]	0.113	1.31 [0.93]-[1.84]	0.975
Primary occupation: skilled trade	626	267	42.7 [35.6-49.7]	3	0.247	1.28 [0.84]-[1.95]	0.195	1.34 [0.85]-[2.09]	0.123	1.3 [0.93]-[1.82]	0.98
Low wage (2/3 of mean wage per person per day)	291	249	85.6 [70.7-100.4]	12.3	0.432	1.45 [0.56]-[3.74]	0.223	2.53 [0.55]-[11.71]	0.142	1.99 [0.78]-[5.04]	0.366
Income from: Sales Of Camel And Cattle	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Livestock Sale (Sheep/Goat)	306	3	1 [-1-3]	3	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.794
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Crop Sale	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Petty Trade	306	36	11.8 [5.2-18.3]	3	0.226	0.52 [0.17]-[1.54]	0.184	0.23 [0.02]-[2.10]	0.069	0.38 [0.14]-[1.08]	0.087
Income from: Other Trade (Specify):	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.

Income from: Casual Labour Wage (Portage, Construction, Etc.)	306	118	38.6 [28.8-48.3]	2.9	0.637	1.14 [0.66]-[1.96]	0.724	0.86 [0.37]-[2.01]	0.785	1.08 [0.62]-[1.88]	0.557
Income from: Casual Labour Wage (Farm Labour)	306	47	15.4 [7.7-23]	3.2	0.069	1.81 [0.95]-[3.45]	0.895	1.07 [0.39]-[2.89]	0.038	1.87 [1.04]-[3.35]	0.123
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	306	102	33.3 [27.5-39.2]	1.1	0.98	0.99 [0.55]-[1.78]	0.877	0.95 [0.46]-[1.93]	0.657	1.11 [0.68]-[1.83]	0.674
Income from: Skilled/Salary Work	306	16	5.2 [1.6-8.9]	2	0.551	1.41 [0.44]-[4.49]	0.22	2.16 [0.61]-[7.60]	0.937	1.05 [0.31]-[3.60]	0.941
Income from: Remittance	306	5	1.6 [-0.7-4]	2.5	0.974	1.04 [0.12]-[9.01]	.	1 [1.00]-[1.00]	0.818	0.78 [0.09]-[6.90]	0.297
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	306	13	4.2 [0.3-8.2]	2.7	0.283	0.33 [0.04]-[2.61]	0.347	1.66 [0.56]-[4.88]	0.287	0.56 [0.19]-[1.68]	0.427
Income from: Humanitarian Assistance (Cash)	306	92	30.1 [18.9-41.2]	4.3	0.766	1.09 [0.60]-[2.00]	0.211	1.54 [0.77]-[3.07]	0.818	1.07 [0.60]-[1.89]	0.376
Income from: Productive Asset Sale	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Other Asset Sale	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Other Source of Cash Income	306	1	0.3 [-0.3-1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Has assets: any animals	306	11	3.6 [-0.3-7.5]	3.1	0.046	0.93 [0.86]-[1.00]	.	1 [1.00]-[1.00]	0.055	0.91 [0.82]-[1.00]	0
Has assets: sheepgoat	306	50	16.3 [9.2-23.5]	2.7	0.788	0.92 [0.48]-[1.75]	0.602	0.74 [0.23]-[2.41]	0.417	0.77 [0.41]-[1.47]	0.348
Has assets: donkey	306	47	15.4 [8.6-22.1]	2.5	0.071	0.36 [0.12]-[1.10]	0.322	0.56 [0.17]-[1.81]	0.047	0.44 [0.19]-[0.99]	0.2
Has assets: chicken	306	70	22.9 [15.2-30.6]	2.4	0.964	1.02 [0.44]-[2.39]	0.639	0.79 [0.29]-[2.18]	0.772	0.9 [0.44]-[1.85]	0.626
Has assets: land	306	278	90.8 [83.7-98]	4.5	0.601	1.36 [0.41]-[4.52]	0.37	0.65 [0.24]-[1.73]	0.9	1.07 [0.37]-[3.09]	0.41
Has assets: house	306	301	98.4 [96.4-100.3]	1.7	0.256	0.35 [0.06]-[2.22]	0.541	0.44 [0.03]-[6.58]	0.414	0.47 [0.07]-[3.03]	0.572
Has assets: radio	306	5	1.6 [-0.3-3.6]	1.7	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.453
Has assets: bike	306	23	7.5 [3.7-11.3]	1.5	0.795	0.86 [0.27]-[2.76]	0.309	2 [0.51]-[7.85]	0.483	1.41 [0.52]-[3.84]	0.458
Has assets: phone	306	238	77.8 [69.5-86.1]	2.9	0.132	0.62 [0.33]-[1.17]	0.356	0.67 [0.28]-[1.61]	0.125	0.6 [0.31]-[1.16]	0.566
Has assets: agtools	306	29	9.5 [4.1-14.8]	2.4	0.068	0.31 [0.09]-[1.10]	0.569	0.63 [0.13]-[3.21]	0.168	0.52 [0.20]-[1.34]	0.814
Has assets: skwtools	306	31	10.1 [2.6-17.7]	4.5	0.286	0.58 [0.21]-[1.61]	0.056	2.4 [0.98]-[5.90]	0.401	1.32 [0.67]-[2.60]	0.566
Has assets: cart	306	52	17 [8.8-25.2]	3.5	0.242	0.63 [0.28]-[1.39]	0.919	0.93 [0.23]-[3.76]	0.468	0.75 [0.34]-[1.67]	0.725
Has assets: wheelbarrow	306	5	1.6 [-0.1-3.3]	1.3	0.787	1.39 [0.12]-[16.19]	0.505	2.26 [0.19]-[26.72]	0.285	3.2 [0.36]-[28.49]	0.727
Spends over 80% of earnings on food	306	54	17.6 [9.1-26.2]	3.6	0.591	0.8 [0.34]-[1.88]	0.443	1.41 [0.57]-[3.53]	0.723	0.88 [0.41]-[1.87]	0.753
Has savings	95				.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Coping: Sell household assets/goods	88	64	72.7 [55.7-89.8]	2.8	0.716	1.26 [0.33]-[4.80]	0.634	1.45 [0.28]-[7.54]	0.599	1.35 [0.41]-[4.45]	0.782
Coping: Purchase food on credit or borrowed food	227	214	94.3 [89.1-99.5]	2.7	0.185	0.54 [0.21]-[1.37]	0.293	0.46 [0.10]-[2.03]	0.001	0.39 [0.24]-[0.64]	0.085
Coping: Spend savings	121	116	95.9 [89.8-101.9]	2.5	0.508	0.58 [0.11]-[3.10]	.	1 [1.00]-[1.00]	0.89	1.12 [0.22]-[5.75]	0.002
Coping: Borrow money	180	175	97.2 [92.5-102]	3.5	0.008	0.11 [0.02]-[0.53]	0.056	0.4 [0.16]-[1.03]	0.024	0.16 [0.03]-[0.77]	.

Coping: Withdrew children from madrassa school	63	60	95.2 [88.4-102.1]	1.4	0.63	0.47 [0.02]-[12.82]	.	1 [1.00]-[1.00]	0.811	0.7 [0.03]-[16.64]	.
Coping: Sell house or land	44	25	56.8 [26.8-86.8]	3.4	0.626	0.65 [0.10]-[4.20]	0.733	0.73 [0.10]-[5.25]	0.618	0.63 [0.09]-[4.41]	0.751
Coping: Beg at the mosque for food or money to buy food	265	257	97 [94.1-99.9]	1.8	0.627	1.66 [0.20]-[13.91]	.	1 [1.00]-[1.00]	0.483	2.11 [0.24]-[18.35]	0.502
Coping: Sell last breeding animals	262	254	96.9 [93.5-100.4]	2.6	0.667	0.7 [0.13]-[3.72]	0.68	0.73 [0.16]-[3.42]	0.895	0.9 [0.16]-[4.94]	0.286
no food or no money for food in past 7 days	272				.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Received Vitamin A in last six months	626	449	71.7 [59.1-84.3]	11.6	0.166	1.36 [0.87]-[2.12]	0.453	1.17 [0.76]-[1.81]	0.128	1.38 [0.91]-[2.09]	0.298
Received measles vaccination in last six months	626	440	70.3 [58.6-82]	9.8	0.543	1.17 [0.70]-[1.95]	0.415	1.27 [0.70]-[2.28]	0.252	1.29 [0.83]-[2.01]	0.078
Received polio vaccination in last six months	626	574	91.7 [87.4-96]	3.6	0.421	0.79 [0.44]-[1.43]	0.963	0.98 [0.34]-[2.79]	0.612	0.86 [0.47]-[1.58]	0.154
Diarrhoea in last 2 weeks	626	27	4.3 [2.4-6.3]	1.4	0.577	1.34 [0.46]-[3.91]	0	4.52 [2.22]-[9.24]	0.103	1.98 [0.86]-[4.53]	0.022
Pneumonia in last 2 weeks	626	34	5.4 [2.8-8.1]	2	0.556	0.68 [0.18]-[2.55]	0.253	1.72 [0.66]-[4.44]	0.776	0.83 [0.23]-[3.07]	0.54
fever in last 2 weeks	626	41	6.5 [2.3-10.8]	4.4	0.706	0.84 [0.32]-[2.18]	0.048	2.11 [1.01]-[4.43]	0.913	1.05 [0.46]-[2.39]	0.07
measles in last 2 weeks	626	5	0.8 [0-1.6]	1.3	0.921	1.13 [0.09]-[13.60]	.	1 [1.00]-[1.00]	0.886	0.84 [0.07]-[10.23]	0.168
morbidity in last two weeks	626	72	11.5 [6.4-16.6]	3.8	0.4	0.7 [0.30]-[1.65]	0.003	2.43 [1.38]-[4.29]	0.979	1.01 [0.51]-[2.00]	0.191
HDD: Cereals in last 24 hr	304				.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: White Roots And Tubers in last 24 hr	304	37	12.2 [5.3-19]	3.1	0.074	1.99 [0.93]-[4.27]	0.526	1.45 [0.44]-[4.73]	0.161	1.67 [0.81]-[3.45]	0.352
HDD: Vitamin A Rich Vegetables in last 24 hr	306	2	0.7 [-0.7-2]	2	0	4.19 [3.12]-[5.63]	0	9.13 [6.10]-[13.67]	0	3.17 [2.39]-[4.20]	.
HDD: Dark Green Leafy Vegetables in last 24 hr	306	8	2.6 [-0.3-5.5]	2.4	0.662	0.68 [0.12]-[3.99]	0.839	1.28 [0.11]-[14.64]	0.766	1.26 [0.26]-[6.21]	0.707
HDD: Other Vegetables in last 24 hr	306	223	72.9 [63.8-82]	3	0.725	1.13 [0.55]-[2.34]	0.47	0.76 [0.35]-[1.64]	0.723	0.92 [0.56]-[1.50]	0.347
HDD: Vitamin A Rich Fruits in last 24 hr	306	1	0.3 [-0.3-1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: Other Fruits in last 24 hr	306	7	2.3 [-0.3-4.9]	2.1	0.498	1.68 [0.36]-[7.90]	0.725	1.49 [0.15]-[15.22]	0.753	1.26 [0.28]-[5.70]	0.218
HDD: Organ Meat in last 24 hr	306	11	3.6 [-0.7-7.9]	3.9	0.444	1.58 [0.47]-[5.31]	0.831	0.88 [0.27]-[2.88]	0.761	1.18 [0.38]-[3.68]	0.24
HDD: Flesh Meats in last 24 hr	306	37	12.1 [5.4-18.8]	3	0.657	0.81 [0.30]-[2.14]	0.296	0.47 [0.11]-[2.00]	0.494	0.73 [0.29]-[1.84]	0.34
HDD: Eggs in last 24 hr	306	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: Fish And Seafood in last 24 hr	306		1 [-0.5-2.5]	1.6	0.611	2.09 [0.11]-[39.18]	.	1 [1.00]-[1.00]	0.75	1.58 [0.09]-[28.85]	.
HDD: Legumes, Nuts And Seeds in last 24 hr	306	126	41.2 [27.8-54.5]	5.3	0.718	0.9 [0.51]-[1.59]	0.686	1.2 [0.48]-[2.97]	0.717	1.08 [0.70]-[1.67]	0.229
HDD: Milk And Milk Products	306	256	83.7 [76-91.3]	3.1	0.067	1.89 [0.95]-[3.75]	0.61	0.79 [0.32]-[1.99]	0.393	1.29 [0.70]-[2.37]	0.903
HDD: Oils And Fats	306	304	99.3 [98.4-100.3]	1	0.327	0.24 [0.01]-[4.53]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: Sweets	306	234	76.5 [63.9-89]	6.4	0.471	1.25 [0.67]-[2.33]	0.468	1.32 [0.61]-[2.83]	0.197	1.4 [0.83]-[2.35]	0.07
HDD: Spices, Condiments, Beverages	306	305	99.7 [99-100.3]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
HDD: Any veg	306	226	73.9 [64.9-82.8]	3	0.86	1.06 [0.52]-[2.19]	0.382	0.72 [0.33]-[1.55]	0.519	0.86 [0.53]-[1.39]	0.339
HDD: Any fruit	306	8	2.6 [0-5.2]	1.9	0.646	1.39 [0.32]-[6.01]	0.827	1.28 [0.13]-[12.34]	0.947	1.05 [0.25]-[4.32]	0.157
HDD: Any meat	306	45	14.7 [7.3-22.1]	3.2	0.86	1.08 [0.46]-[2.50]	0.44	0.59 [0.15]-[2.32]	0.821	0.91 [0.39]-[2.11]	0.263

HDD: Four+ food groups in last 7 days	626	297	47.4 [42.9-51.9]	1.2	0.231	1.28 [0.85]-[1.93]	0.785	1.08 [0.61]-[1.89]	0.483	1.15 [0.77]-[1.71]	0.726
HDD: Four+ food groups in last 7 dayless than mean score	626	321	51.3 [47.4-55.1]	0.9	0.382	0.83 [0.55]-[1.27]	0.487	0.84 [0.52]-[1.38]	0.437	0.87 [0.59]-[1.26]	0.747
Past 7 days: Shifted to less preferred (low quality, less expensive) foods	213	120	56.3 [39.5-73.1]	5.8	0.839	0.93 [0.44]-[1.94]	0.061	2.39 [0.96]-[5.98]	0.465	1.27 [0.65]-[2.48]	0.33
Past 7 days: Limited the portion/quantity consumed in a meal	266	155	58.3 [42.5-74.1]	6.5	0.629	0.87 [0.48]-[1.57]	0.427	1.48 [0.55]-[4.03]	0.91	1.03 [0.56]-[1.92]	0.605
Past 7 days: Took fewer numbers of meals in a day	266	157	59 [43.8-74.3]	6	0.327	0.73 [0.38]-[1.40]	0.287	1.65 [0.64]-[4.28]	0.795	0.92 [0.46]-[1.81]	0.922
Past 7 days: Restricted consumption of adults for small children to eat?	286	98	34.3 [22.2-46.3]	4.3	0.601	0.83 [0.41]-[1.70]	0.926	0.96 [0.35]-[2.61]	0.648	0.85 [0.42]-[1.74]	0.07
Past 7 days: Relied on food donations from relatives	276	167	60.5 [46.6-74.4]	5.3	0.553	0.81 [0.39]-[1.68]	0.046	2.21 [1.01]-[4.82]	0.6	1.18 [0.62]-[2.25]	0.985
Past 7 days: Consumed spoilt or left-over foods	306	11	3.6 [0.3-6.8]	2.2	0.61	1.58 [0.26]-[9.80]	0.916	0.88 [0.08]-[9.76]	0.476	1.84 [0.33]-[10.40]	0.081
WASH: Main source of drinking water unprotected	181	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
WASH: Toilet used by most members of the household	180	20	11.1 [-0.6-22.8]	5.9	0.039	0.21 [0.05]-[0.92]	0.816	0.79 [0.10]-[6.25]	0.01	0.36 [0.17]-[0.76]	0.035

Table 33: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Gu season, 2019 (FSNAU)

Risk factor					Wasting (W/H)		Wasting (MUAC)		Wasting by MUAC and/or W/H		Stun...	
Logistic Regression					Children 6-59 months		Children 6-59 months		Children 6-59 months		Children 6-	
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	O
Male child	660	328	49.7 [45.8-53.6]	0.9	0.636	1.09 [0.76]-[1.57]	0.183	0.69 [0.40]-[1.20]	0.947	0.99 [0.69]-[1.42]	0.009	1.76
Main provider female	660	127	19.2 [13.8-24.7]	3	0.468	1.2 [0.72]-[2.01]	0.638	0.84 [0.40]-[1.78]	0.335	1.32 [0.74]-[2.35]	0.47	0.83
Household head female	658	198	30.1 [19-41.2]	9.2	0.338	1.23 [0.80]-[1.88]	0.397	0.74 [0.36]-[1.52]	0.338	1.26 [0.78]-[2.04]	0.006	0.51
Age group -<24 months	660	224	33.9 [31.2-36.7]	0.5	0.718	1.08 [0.70]-[1.65]	0	8.89 [4.85]-[16.30]0.000	0.006	1.68 [1.18]-[2.40]	0.016	1.61
Age group -<36 months	660	388	58.8 [56.2-61.3]	0.4	0.611	1.12 [0.71]-[1.77]	0	17.05 [5.41]-[53.74]	0.049	1.58 [1.00]-[2.51]	0	3.87
Above average household size (> =6 members)	660	294	44.5 [39.3-49.8]	1.7	0.473	0.84 [0.51]-[1.38]	0.05	0.56 [0.32]-[1.00]	0.235	0.76 [0.48]-[1.21]	0.471	0.88
Number of children under 5 >1	660	368	55.8 [50-61.5]	2.1	0.652	1.1 [0.71]-[1.70]	0.24	0.75 [0.45]-[1.23]	0.891	0.97 [0.66]-[1.43]	0.966	1.01
Household displaced by insecurity	660	284	43 [33.9-52.2]	5.3	0.44	1.16 [0.78]-[1.73]	0.456	0.81 [0.46]-[1.43]	0.451	1.15 [0.79]-[1.67]	0.279	0.84
Household displaced by drought	660	338	51.2 [40.3-62.1]	7.5	0.756	1.06 [0.73]-[1.54]	0.2	1.48 [0.80]-[2.76]	0.748	1.06 [0.73]-[1.54]	0.058	1.39
Household displaced by eviction	660	1	0.2 [-0.2-0.5]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Household displaced by conflict	660	14	2.1 [-0.3-4.5]	4.4	0.297	0.33 [0.04]-[2.77]	.	1 [1.00]-[1.00]	0.208	0.26 [0.03]-[2.21]	0.003	0.27
Household displaced by flood /fire	660	2	0.3 [-0.3-0.9]	2	0	4.44 [3.49]-[5.66]	.	1 [1.00]-[1.00]	0	3.49 [2.80]-[4.36]	.	1
Household displaced by loss of livelihood	660	44	6.7 [3.7-9.7]	2.2	0.309	0.55 [0.17]-[1.81]	0.743	1.19 [0.41]-[3.45]	0.787	0.89 [0.36]-[2.20]	0.897	0.96
Household displaced by other reasons	660	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Primary occupation: Casual labor	660	302	45.8 [42-49.5]	0.9	0.307	0.82 [0.55]-[1.21]	0.56	1.17 [0.68]-[2.00]	0.523	0.89 [0.63]-[1.27]	0.752	1.06
Primary occupation: self employed	660	285	43.2 [38.4-48]	1.5	0.2	0.78 [0.53]-[1.15]	0.628	1.14 [0.65]-[2.00]	0.452	0.88 [0.62]-[1.24]	0.345	1.19
Primary occupation: petty trade	660	285	43.2 [38.5-47.9]	1.4	0.206	0.78 [0.53]-[1.16]	0.624	1.14 [0.66]-[1.99]	0.456	0.88 [0.62]-[1.25]	0.416	1.16
Primary occupation: other trade	660	282	42.7 [37.6-47.9]	1.7	0.242	0.8 [0.54]-[1.17]	0.574	1.17 [0.67]-[2.03]	0.54	0.9 [0.64]-[1.27]	0.413	1.16
Primary occupation: skilled trade	660	286	43.3 [38.4-48.2]	1.5	0.264	0.81 [0.55]-[1.18]	0.645	1.14 [0.65]-[1.98]	0.554	0.91 [0.64]-[1.27]	0.548	1.12
Low wage (2/3 of mean wage per person per day)	309	248	80.3 [73.9-86.6]	1.9	0.911	0.96 [0.42]-[2.18]	0.524	1.37 [0.51]-[3.71]	0.93	1.04 [0.46]-[2.35]	0.865	0.94
Income from: Sales Of Camel And Cattle	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Income from: Livestock Sale (Sheep/Goat)	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	311	1	0.3 [-0.3-1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1
Income from: Crop Sale	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1

Income from: Petty Trade	311	46	14.8 [7.4-22.2]	3.2	0.538	0.81 [0.40]-[1.63]	0.491	1.38 [0.54]-[3.55]	0.627	0.86 [0.46]-[1.62]	0.019	0.25
Income from: Other Trade (Specify):	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Income from: Casual Labour Wage (Portage, Construction, Etc.)	311	143	46 [34.7-57.2]	3.7	0.991	1 [0.58]-[1.73]	0.138	0.58 [0.28]-[1.20]	0.171	0.71 [0.43]-[1.17]	0.126	0.65
Income from: Casual Labour Wage (Farm Labour)	311	53	17 [9.6-24.4]	2.9	0.132	0.49 [0.19]-[1.26]	0.45	1.42 [0.56]-[3.61]	0.799	0.9 [0.38]-[2.13]	0.815	1.09
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	311	73	23.5 [14.6-32.3]	3.2	0.478	1.26 [0.65]-[2.42]	0.826	0.9 [0.35]-[2.30]	0.354	1.35 [0.70]-[2.60]	0.019	1.91
Income from: Skilled/Salary Work	311	34	10.9 [4.6-17.2]	3	0.454	0.68 [0.24]-[1.92]	0.699	0.83 [0.31]-[2.24]	0.661	0.84 [0.37]-[1.90]	0.444	1.33
Income from: Remittance	311	2	0.6 [-0.3-1.5]	0.9	0.26	5.21 [0.27]-[99.08]	0.152	8.97 [0.42]-[189.44]	0.363	3.89 [0.19]-[78.99]	0.721	1.64
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Income from: Humanitarian Assistance (Cash)	311	1	0.3 [-0.3-1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Income from: Productive Asset Sale	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Income from: Other Asset Sale	311	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Income from: Other Source of Cash Income	311	2	0.6 [-0.7-2]	2	0	5.21 [3.83]-[7.09]	.	1 [1.00]-[1.00]	0	3.89 [2.89]-[5.22]	.	1 [
Has assets: any animals	310	16	5.2 [1.7-8.6]	1.8	0.843	0.84 [0.15]-[4.79]	0.784	1.26 [0.23]-[6.85]	0.954	1.04 [0.23]-[4.82]	0.584	0.73
Has assets: sheepgoat	310	57	18.4 [11.1-25.7]	2.6	0.643	1.17 [0.59]-[2.30]	0.683	0.8 [0.27]-[2.37]	0.86	0.95 [0.50]-[1.79]	0.668	0.85
Has assets: donkey	310	51	16.5 [8.9-24]	3	0.801	1.11 [0.47]-[2.66]	0.573	0.7 [0.20]-[2.50]	0.6	0.79 [0.31]-[1.98]	0.544	1.17
Has assets: chicken	310	70	22.6 [13.9-31.2]	3.2	0.086	0.51 [0.23]-[1.11]	0.029	0.33 [0.12]-[0.88]	0.071	0.5 [0.24]-[1.06]	0.473	0.81
Has assets: land	310	231	74.5 [58.7-90.3]	9.7	0.136	0.65 [0.37]-[1.16]	0.232	0.62 [0.28]-[1.39]	0.259	0.72 [0.40]-[1.30]	0.012	0.46
Has assets: house	310	305	98.4 [96.2-100.5]	2.1	0.699	0.78 [0.21]-[2.87]	.	1 [1.00]-[1.00]	0.943	1.05 [0.28]-[3.86]	0.906	0.92
Has assets: radio	310	66	21.3 [8.6-33.9]	7	0.574	0.78 [0.32]-[1.91]	0.199	0.35 [0.07]-[1.79]	0.183	0.55 [0.22]-[1.35]	0.034	0.33
Has assets: bike	310	19	6.1 [1.1-11.1]	3.2	0.946	0.95 [0.23]-[3.93]	0.158	2.5 [0.68]-[9.18]	0.625	1.4 [0.35]-[5.60]	0.533	0.74
Has assets: phone	310	269	86.8 [80-93.5]	2.9	0.946	0.94 [0.17]-[5.20]	0.88	1.07 [0.41]-[2.84]	0.904	0.92 [0.22]-[3.81]	0.564	1.33
Has assets: agtools	310	32	10.3 [6.1-14.6]	1.4	0.727	0.73 [0.12]-[4.43]	0.394	1.72 [0.48]-[6.23]	0.62	1.38 [0.37]-[5.13]	0.942	1.03
Has assets: skwtools	310	60	19.4 [10.3-28.4]	3.8	0.522	1.22 [0.65]-[2.27]	0.612	0.75 [0.24]-[2.36]	0.761	1.1 [0.58]-[2.10]	0.968	1.01
Has assets: cart	310	46	14.8 [8.2-21.5]	2.5	0.537	1.3 [0.55]-[3.03]	0.721	0.8 [0.23]-[2.80]	0.841	0.92 [0.38]-[2.19]	0.527	1.17
Has assets: wheelbarrow	309	9	2.9 [0.4-5.4]	1.6	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.13	0.23
Spends over 80% of earnings on food	310	31	10 [3.9-16.1]	3.1	0.891	1.07 [0.39]-[2.93]	0.611	1.33 [0.43]-[4.12]	0.63	1.24 [0.50]-[3.12]	0.3	0.64
Has savings	308	3	1 [-0.5-2.4]	1.6	0.515	2.56 [0.14]-[47.87]	0.321	4.42 [0.22]-[90.22]	0.655	1.91 [0.10]-[36.14]	0.768	0.81
Coping: Sell household assets/goods	63	41	65.1 [38.5-91.6]	4	0.254	0.39 [0.07]-[2.20]	0.115	4.32 [0.66]-[28.49]	0.467	0.64 [0.18]-[2.34]	0.715	1.27
Coping: Purchase food on credit or borrowed food	290	287	99 [96.9-101.1]	3	.	1 [1.00]-[1.00]	0	0.22 [0.14]-[0.35]	0	0.52 [0.38]-[0.71]	0	0.33
Coping: Spend savings	93	85	91.4 [78.9-103.9]	4.2	0.354	0.68 [0.29]-[1.59]	0.635	0.73 [0.18]-[2.89]	0.544	0.78 [0.34]-[1.80]	0.126	1.92

	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	
Coping: Borrow money	249	46	18.5 [8.1-28.8]	4.2	0.849	0.94 [0.51]-[1.74]	0.294	0.55 [0.17]-[1.74]	0.379	0.75 [0.38]-[1.46]	0.96	1.02
Coping: Sell house or land	14	13	92.9 [71.8-113.9]	1.3	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Coping: Beg at the mosque for food or money to buy food	295	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
Coping: Sell last breeding animals	7	4	57.1 [-107.4-221.7]	3.6	0.837	0.67 [0.00]-[1149.35]			0.837	0.67 [0.00]-[1149.35]	.	1 [
no food or no money for food in past 7 days	0			0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.507	2 [0
Received Vitamin A in last six months	660	623	94.4 [91-97.8]	3.4	0.435	0.66 [0.23]-[1.92]	0.55	0.68 [0.19]-[2.49]	0.553	0.74 [0.26]-[2.11]	.	1 [
Received measles vaccination in last six months	660	580	87.9 [83.2-92.5]	3.2	0.951	1.02 [0.48]-[2.16]	0.37	0.64 [0.24]-[1.73]	0.652	0.86 [0.45]-[1.67]	0.666	1.15
Received polio vaccination in last six months	660	651	98.6 [97.7-99.6]	1.1	0.659	0.68 [0.11]-[4.09]	0.092	0.21 [0.03]-[1.32]	0.865	0.86 [0.15]-[5.09]	0.191	1.46
Diarrhea in last 2 weeks	660	21	3.2 [1.7-4.7]	1.2	0	4.72 [2.38]-[9.39]	0	9.65 [4.27]-[21.84]	0	5.59 [3.26]-[9.59]	0.575	0.74
Pneumonia in last 2 weeks	660	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.371	1.55
fever in last 2 weeks	660	13	2 [0.7-3.3]	1.4	0.054	3.93 [0.98]-[15.81]	0.013	4.27 [1.38]-[13.16]	0.013	4.21 [1.39]-[12.74]	.	1 [
measles in last 2 weeks	660	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.228	1.98
morbidity in last two weeks	660	26	3.9 [1.9-5.9]	1.7	0.001	4.42 [1.99]-[9.80]	0	7.88 [3.74]-[16.60]	0	4.79 [2.45]-[9.35]	.	1 [
HDD: Cereals in last 24 hr	310	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.368	1.46
HDD: White Roots And Tubers in last 24 hr	310	14	4.5 [1-8]	2	0.442	0.41 [0.04]-[4.23]	0.18	2.51 [0.64]-[9.89]	0.653	0.68 [0.12]-[3.78]	.	1 [
HDD: Vitamin A Rich Vegetables in last 24 hr	310	7	2.3 [-0.6-5.1]	2.7	.	1 [1.00]-[1.00]	0.677	1.46 [0.23]-[9.33]	0.604	0.63 [0.10]-[3.82]	0.062	0.12
HDD: Dark Green Leafy Vegetables in last 24 hr	310	16	5.2 [1.4-8.9]	2.1	0.193	2.73 [0.58]-[12.76]	.	1 [1.00]-[1.00]	0.367	1.99 [0.43]-[9.29]	0.148	0.26
HDD: Other Vegetables in last 24 hr	310	229	73.9 [66.5-81.3]	2.1	0.572	0.86 [0.50]-[1.48]	0.07	0.55 [0.29]-[1.05]	0.091	0.68 [0.43]-[1.07]	0.192	0.24
HDD: Vitamin A Rich Fruits in last 24 hr	310	14	4.5 [0.2-8.8]	3.1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.078	0.59
HDD: Other Fruits in last 24 hr	310	14	4.5 [0.2-8.8]	3.1	0.571	1.42 [0.41]-[4.94]	0.645	1.48 [0.26]-[8.27]	0.175	2.22 [0.68]-[7.21]	.	1 [
HDD: Organ Meat in last 24 hr	310	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.014	0.26
HDD: Flesh Meats in last 24 hr	310	50	16.1 [6.6-25.7]	4.9	0.915	0.97 [0.50]-[1.85]	0.344	0.51 [0.12]-[2.15]	0.815	1.1 [0.50]-[2.41]	.	1 [
HDD: Eggs in last 24 hr	310	4	1.3 [-0.8-3.4]	2.4	0.288	1.72 [0.62]-[4.77]	.	1 [1.00]-[1.00]	0.624	1.28 [0.46]-[3.53]	0.004	0.26
HDD: Fish And Seafood in last 24 hr	310	2	0.6 [-0.7-2]	2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.672	0.54
HDD: Legumes, Nuts And Seeds in last 24 hr	310	124	40 [28.2-51.8]	4.3	0.856	1.05 [0.60]-[1.85]	0.478	1.37 [0.56]-[3.34]	0.284	1.44 [0.73]-[2.83]	0.016	1.63
HDD: Milk And Milk Products	310	278	89.7 [83.7-95.6]	2.8	0.318	2.85 [0.35]-[23.45]	0.401	1.81 [0.43]-[7.60]	0.2	3.86 [0.47]-[31.76]	0.859	0.95
HDD: Oils And Fats	310	308	99.4 [98-100.7]	2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.278	1.65
HDD: Sweets	310	257	82.9 [70.4-95.4]	8.1	0.426	1.66 [0.46]-[6.00]	0.485	1.5 [0.46]-[4.83]	0.32	1.58 [0.62]-[4.01]	.	1 [
HDD: Spices, Condiments, Beverages	310	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.111	2 [
HDD: Any veg	310	234	75.5 [67.8-83.2]	2.3	0.635	0.87 [0.49]-[1.55]	0.039	0.5 [0.26]-[0.96]	0.089	0.67 [0.42]-[1.07]	0.027	0.5
HDD: Any fruit	660	30	4.5 [0.2-8.8]	3.1	0.571	1.42 [0.41]-[4.94]	0.645	1.48 [0.26]-[8.27]	0.175	2.22 [0.68]-[7.21]	0.014	0.26
HDD: Any meat	660	106	16.1 [6.6-25.7]	4.9	0.915	0.97 [0.50]-[1.85]	0.344	0.51 [0.12]-[2.15]	0.815	1.1 [0.50]-[2.41]	0.004	0.26

HDD: Four+ food groups in last 7 days	660	221	33.5 [26.9-40]	3	0.572	0.89 [0.58]-[1.36]	0.516	1.18 [0.70]-[2.00]	0.972	1.01 [0.71]-[1.42]	0.576	1.12
HDD: Four+ food groups in last 7 dayless than mean score	196	104	53 [49.8-56.3]	0.7	0.191	1.3 [0.87]-[1.94]	0.708	0.9 [0.53]-[1.56]	0.323	1.19 [0.83]-[1.70]	0.751	0.94
WASH: Main source of drinking water unprotected	196	0		0	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [
WASH: Toilet used by most members of the household	196	19	9.7 [2.7-16.7]	2.6	0.397	1.76 [0.46]-[6.79]	.	1 [1.00]-[1.00]	0.562	1.47 [0.38]-[5.63]	0.068	0.37

Table 34: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by logistic regression in Gu season, 2020 (FSNAU)

Risk factor					Wasting (W/H) *Children 0-59 months*		Wasting (MUAC) *Children 6-59 months*[1]		Wasting by MUAC and/or W/H *Children 6-59 months*		S... *Children*
Indicator	N	n	Proportion in analyzed sample [95% CI]	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value
Male child	615	318	51.7 [47.7-55.7]	0.9	0.003	2.33 [1.35]-[3.99]	0.111	1.62 [0.89]-[2.96]	0.001	2.32 [1.44]-[3.74]	0.173
Main provider female	612	100	16.3 [12.3-20.4]	1.7	0.969	1.02 [0.43]-[2.38]	0.841	0.89 [0.26]-[3.01]	0.717	0.87 [0.41]-[1.86]	0.191
Household head female	610	71	11.6 [6.7-16.6]	3.4	0.933	0.96 [0.36]-[2.55]	0.229	0.28 [0.03]-[2.32]	0.751	0.87 [0.37]-[2.07]	0.016
Age group -<24 months	615	210	34.1 [31-37.3]	0.7	0.701	1.11 [0.63]-[1.98]	0	7.39 [2.93]-[18.61]	0.053	1.63 [0.99]-[2.66]	0.589
Age group -<36 months											
Above average household size (> =6 members)	615	326	53 [46.1-59.9]	2.8	0.461	0.82 [0.49]-[1.40]	0.493	1.3 [0.59]-[2.86]	0.527	0.85 [0.51]-[1.42]	0.174
Number of children under 5 >1	615	315	51.2 [44.4-58.1]	2.7	0.951	1.02 [0.57]-[1.82]	0.783	0.88 [0.34]-[2.27]	0.805	0.93 [0.51]-[1.71]	0.03
Household displaced by insecurity	614	298	48.5 [36.3-60.7]	8.7	0.178	1.44 [0.84]-[2.49]	0.151	1.85 [0.79]-[4.36]	0.182	1.42 [0.84]-[2.39]	0.287
Household displaced by drought	614	286	46.6 [35.3-57.8]	7.4	0.178	0.7 [0.41]-[1.19]	0.888	1.07 [0.41]-[2.77]	0.323	0.78 [0.47]-[1.29]	0.541
Household displaced by eviction	614	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Household displaced by conflict	614	21	3.4 [-0.1-7]	5.5	0.575	1.38 [0.43]-[4.46]	.	1 [1.00]-[1.00]	0.866	1.1 [0.34]-[3.59]	0.388
Household displaced by flood /fire	614	8	1.3 [-0.1-2.7]	2.1	0.963	1.04 [0.17]-[6.38]	.	1 [1.00]-[1.00]	0.841	0.84 [0.14]-[5.15]	0.563
Household displaced by loss of livelihood	614	21	3.4 [0.3-6.6]	4.4	0.656	0.8 [0.30]-[2.16]	.	1 [1.00]-[1.00]	0.357	0.64 [0.24]-[1.69]	0.055
Household displaced by other reasons	614	3	0.5 [-0.5-1.5]	3	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.031
Primary occupation: Casual labor	615	208	33.8 [28.8-38.8]	1.6	0.028	2.03 [1.08]-[3.82]	0.545	0.82 [0.42]-[1.61]	0.054	1.64 [0.99]-[2.72]	0.815
Primary occupation: self employed	615	45	7.3 [3.1-11.5]	3.8	0.109	0.33 [0.08]-[1.30]	0.468	0.48 [0.06]-[3.78]	0.119	0.41 [0.13]-[1.28]	0.021
Primary occupation: petty trade	615	72	11.7 [8-15.4]	1.9	0.564	0.78 [0.32]-[1.88]	0.907	0.94 [0.32]-[2.74]	0.589	0.84 [0.43]-[1.64]	0.533
Primary occupation: other trade	615	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Primary occupation: skilled trade	615	27	4.4 [2.3-6.5]	1.5	0.183	2.19 [0.68]-[7.08]	0.177	2.94 [0.60]-[14.47]	0.339	1.73 [0.55]-[5.48]	0.01
Low wage (2/3 of mean wage per person per day)	285	134	47 [31.8-62.2]	6.3	0.96	1.02 [0.50]-[2.09]	0.766	0.8 [0.17]-[3.74]	0.832	0.92 [0.43]-[1.98]	0.789
Income from: Sales Of Camel And Cattle	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Livestock Sale (Sheep/Goat)	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Poultry / Livestock Product (Milk,Meat, Egg, Ghee)	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Crop Sale	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.
Income from: Petty Trade	293	79	27 [20-33.9]	1.7	0.455	0.72 [0.29]-[1.76]	0.88	0.9 [0.21]-[3.78]	0.641	0.84 [0.39]-[1.79]	0.685
Income from: Other Trade (Specify):	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.

Income from: Casual Labour Wage (Portage, Construction, Etc.)	293	161	54.9 [45.5-64.4]	2.5	0.072	2.25 [0.93]-[5.44]	0.226	0.57 [0.23]-[1.44]	0.024	2.32 [1.13]-[4.79]	0.969	1.
Income from: Casual Labour Wage (Farm Labour)	293	39	13.3 [7.6-19.1]	2	0.463	0.67 [0.22]-[2.02]	0.312	2.27 [0.44]-[11.61]	0.348	0.59 [0.19]-[1.82]	0.595	
Income from: Self-Employment (Sale Of Bush Product, Handicraft, Etc.)	293	45	15.4 [7.1-23.6]	3.6	0.047	0.25 [0.06]-[0.98]	0.464	0.49 [0.07]-[3.52]	0.076	0.35 [0.11]-[1.13]	0.016	0.
Income from: Skilled/Salary Work	293	30	10.2 [5.7-14.8]	1.6	0.466	1.58 [0.44]-[5.61]	0.141	3.14 [0.67]-[14.74]	0.583	1.39 [0.41]-[4.71]	0.037	2.
Income from: Remittance	293	4	1.4 [-0.6-3.3]	1.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.862	1.
Income from: Gifts/Zakaat (Cash, Food-In-Kind, Animals, Etc.)	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Humanitarian Assistance (Cash)	293	13	4.4 [-0.5-9.4]	4	0.569	0.53 [0.06]-[5.04]	.	1 [1.00]-[1.00]	0.503	0.48 [0.05]-[4.49]	0.371	0.
Income from: Productive Asset Sale	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Other Asset Sale	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Income from: Other Source of Cash Income	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Has assets: any animals	288	8	2.8 [-0.1-5.6]	2	0.856	0.86 [0.15]-[4.81]	0.265	3.49 [0.37]-[33.27]	0.258	1.83 [0.62]-[5.38]	0.391	0.
Has assets: sheepgoat	293	51	17.4 [9.3-25.6]	3.2	0.483	0.63 [0.17]-[2.36]	0.488	1.62 [0.40]-[6.59]	0.553	0.71 [0.22]-[2.30]	0.403	0.
Has assets: donkey	292	37	12.7 [5.4-19.9]	3.3	0.419	1.53 [0.53]-[4.46]	0.162	3.74 [0.57]-[24.63]	0.394	1.64 [0.51]-[5.34]	0.106	1.
Has assets: chicken	293	72	24.6 [13.7-35.4]	4.4	0.733	1.16 [0.49]-[2.74]	0.006	4.65 [1.60]-[13.49]	0.716	1.15 [0.53]-[2.47]	0.805	0.
Has assets: land	293	203	69.3 [53.8-84.7]	7.8	0.011	0.4 [0.20]-[0.79]	0.597	1.35 [0.43]-[4.20]	0.002	0.39 [0.22]-[0.69]	0.136	0.
Has assets: house	293	274	93.5 [86.7-100.3]	5.2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.804	1.
Has assets: radio	293	34	11.6 [3.5-19.7]	4.5	0.172	1.73 [0.78]-[3.88]	0.71	0.68 [0.09]-[5.49]	0.053	1.87 [0.99]-[3.52]	0.194	
Has assets: bike	293	17	5.8 [2-9.6]	1.8	0.327	0.36 [0.04]-[2.96]	.	1 [1.00]-[1.00]	0.28	0.32 [0.04]-[2.67]	0.109	2.
Has assets: phone	293	279	95.2 [91.2-99.2]	2.4	0.453	2.24 [0.25]-[19.77]	.	1 [1.00]-[1.00]	0.394	2.51 [0.28]-[22.12]	0.421	0.
Has assets: agtools	293	27	9.2 [1.7-16.7]	4.7	0.948	1.04 [0.28]-[3.92]	0.89	0.89 [0.16]-[4.82]	0.905	0.92 [0.24]-[3.50]	0.445	
Has assets: skwtools	293	45	15.4 [7.6-23.1]	3.2	0.133	0.42 [0.13]-[1.33]	0.455	0.49 [0.07]-[3.38]	0.187	0.52 [0.19]-[1.40]	0.114	0.
Has assets: cart	291	30	10.3 [4.3-16.3]	2.7	0.167	1.97 [0.74]-[5.24]	0.104	4.87 [0.71]-[33.53]	0.178	2.13 [0.69]-[6.56]	0.266	1.
Has assets: wheelbarrow	293	6	2 [-0.8-4.9]	2.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Spends over 80% of earnings on food	293	36	12.3 [5.1-19.5]	3.3	0.544	0.72 [0.24]-[2.16]	0.69	0.64 [0.07]-[6.24]	0.402	0.64 [0.21]-[1.89]	0.522	0.
Has savings	92	8	8.7 [-5-22.4]	4.8	0.874	0.9 [0.22]-[3.74]	.	1 [1.00]-[1.00]	0.59	0.7 [0.17]-[2.79]	.	
Coping: Sell household assets/goods	46	30	65.2 [36.1-94.4]	3.4	0.665	0.52 [0.02]-[13.83]	.	1 [1.00]-[1.00]	0.665	0.52 [0.02]-[13.83]	0.437	0.
Coping: Purchase food on credit or borrowed food	205	200	97.6 [93.3-101.8]	3.6	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	0.157	1.
Coping: Spend savings	26	14	53.8 [9.9-97.8]	3.7	0.535	2 [0.17]-[23.51]	.	1 [1.00]-[1.00]	0.535	2 [0.17]-[23.51]	0.166	0.
Coping: Borrow money	231	226	97.8 [94.9-100.8]	2.3	0.67	0.57 [0.04]-[8.11]	.	1 [1.00]-[1.00]	0.76	0.67 [0.05]-[9.63]	.	
Coping: Withdrew child from school	9	4	44.4 [-39.5-128.3]	2.3	.	1 [1.00]-[1.00]			.	1 [1.00]-[1.00]	0.749	0.
Coping: Sell house or land	95	91	95.8 [90.1-101.5]	1.7	0.251	0.16 [0.01]-[4.13]	.	1 [1.00]-[1.00]	0.299	0.19 [0.01]-[4.94]	0.047	0.
Coping: Beg at the mosque for food or money to buy food	226	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	

	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	
Coping: Sell last breeding animals	233	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
no food or no money for food in past 7 days	52	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
Received Vitamin A in last six months	615	524	85.2 [74.3-96.1]	13.8	0.043	0.6 [0.37]-[0.98]	0.081	0.39 [0.13]-[1.13]	0.057	0.6 [0.35]-[1.02]	0.131	0
Received measles vaccination in last six months	615	491	79.8 [68.4-91.2]	11.8	0	0.44 [0.30]-[0.65]	0.083	0.41 [0.15]-[1.14]	0.002	0.46 [0.29]-[0.72]	0.829	1
Received polio vaccination in last six months	615	600	97.6 [95-100.1]	4.1	0.016	0.3 [0.11]-[0.78]	0.092	0.28 [0.06]-[1.25]	0.048	0.37 [0.14]-[0.99]	0.154	5.
Diarrhoea in last 2 weeks	615	18	2.9 [0.8-5]	2.2	0.894	0.91 [0.22]-[3.78]	0.064	4.77 [0.91]-[25.07]	0.513	1.71 [0.32]-[9.02]	0.985	0
Pneumonia in last 2 weeks	615	17	2.8 [0.2-5.3]	3.6	.	1 [1.00]-[1.00]	0.209	3.06 [0.51]-[18.14]	0.843	0.84 [0.13]-[5.27]	0.877	0
fever in last 2 weeks	615	36	5.9 [1.9-9.8]	4.1	0.625	1.23 [0.52]-[2.95]	0.669	0.61 [0.06]-[6.49]	0.959	0.98 [0.40]-[2.40]	0.78	0
measles in last 2 weeks	615	1	0.2 [-0.2-0.5]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
morbidity in last two weeks	615	59	9.6 [3.4-15.8]	6.5	0.684	0.85 [0.37]-[1.94]	0.112	2.88 [0.77]-[10.83]	0.615	1.28 [0.47]-[3.49]	0.524	0
HDD: Cereals in last 24 hr	293	293			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: White Roots And Tubers in last 24 hr	293	20	6.8 [1.9-11.8]	2.7	0.258	2.13 [0.56]-[8.15]	.	1 [1.00]-[1.00]	0.337	1.88 [0.50]-[7.11]	0.072	2
HDD: Vitamin A Rich Vegetables in last 24 hr	293	2	0.7 [-0.7-2.1]	2	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Dark Green Leafy Vegetables in last 24 hr	293	23	7.8 [1.6-14.1]	3.7	0.398	1.75 [0.46]-[6.68]	.	1 [1.00]-[1.00]	0.508	1.55 [0.41]-[5.90]	0.01	2
HDD: Other Vegetables in last 24 hr	293	195	66.6 [55.4-77.7]	3.9	0.641	0.87 [0.48]-[1.58]	0.634	0.69 [0.14]-[3.32]	0.519	0.82 [0.44]-[1.53]	0.496	0
HDD: Vitamin A Rich Fruits in last 24 hr	293	1	0.3 [-0.4-1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Other Fruits in last 24 hr	293	2	0.7 [-0.3-1.7]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Organ Meat in last 24 hr	293	2	0.7 [-0.3-1.6]	0.9	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Flesh Meats in last 24 hr	293	28	9.6 [4.4-14.7]	2.1	0.96	1.04 [0.19]-[5.85]	0.137	3.41 [0.66]-[17.65]	0.925	0.92 [0.17]-[5.00]	0.234	1
HDD: Eggs in last 24 hr	293	7	2.4 [-1.4-6.2]	4.3	0.163	2.46 [0.68]-[8.93]	0	11.04 [3.94]-[30.93]	0	4.23 [2.75]-[6.50]	0.987	1.
HDD: Fish And Seafood in last 24 hr	293	13	4.5 [1.4-7.5]	1.5	0.514	0.48 [0.05]-[4.62]	.	1 [1.00]-[1.00]	0.451	0.43 [0.05]-[4.11]	0.824	1
HDD: Legumes, Nuts And Seeds in last 24 hr	292	206	70.6 [60.4-80.9]	3.5	0.963	0.99 [0.54]-[1.81]	0.207	0.4 [0.09]-[1.72]	0.981	1.01 [0.53]-[1.93]	0.953	0
HDD: Milk And Milk Products	293	251	85.7 [78.8-92.6]	2.7	0.16	0.55 [0.24]-[1.28]	0.792	0.83 [0.20]-[3.49]	0.251	0.63 [0.29]-[1.40]	0.806	
HDD: Oils And Fats	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Sweets	293	279	95.2 [91.3-99.2]	2.4	.	1 [1.00]-[1.00]	0.52	0.53 [0.07]-[3.86]	0.336	2.51 [0.37]-[17.24]	0.426	
HDD: Spices, Condiments, Beverages	293	292	99.7 [99-100.4]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
HDD: Any veg	293	200	68.3 [57.7-78.8]	3.6	0.465	0.79 [0.42]-[1.50]	0.559	0.64 [0.13]-[3.02]	0.368	0.74 [0.38]-[1.44]	0.907	0
HDD: Any fruit	293	3	1 [-0.1-2.2]	0.9	0.391	3.04 [0.22]-[41.62]	.	1 [1.00]-[1.00]	0.435	2.72 [0.20]-[36.17]	.	
HDD: Any meat	293	30	10.2 [5.3-15.2]	1.9	0.953	0.95 [0.17]-[5.25]	0.164	3.14 [0.61]-[16.13]	0.836	0.84 [0.16]-[4.49]	0.359	1
HDD: Four+ food groups in last 7 days	615	249	40.5 [35.2-45.7]	1.7	0.404	1.2 [0.77]-[1.89]	0.699	0.86 [0.39]-[1.91]	0.809	1.05 [0.72]-[1.52]	0.944	0
HDD: Four+ food groups in last 7 dayless than mean score	615	327	53.2 [48.4-57.9]	1.3	0.125	0.68 [0.41]-[1.12]	0.792	1.11 [0.51]-[2.40]	0.42	0.85 [0.55]-[1.29]	0.877	1
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	258	226	87.6 [77.8-97.4]	5.4	0.978	1.02 [0.24]-[4.28]	.	1 [1.00]-[1.00]	0.808	1.18 [0.29]-[4.88]	0.95	1

Indicator	N	n	% [CI]		p	OR [CI]	p	OR [CI]	p	OR [CI]	p	
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	263	81	30.8 [19.3-42.3]	3.9	0.739	0.87 [0.36]-[2.09]	0.133	2.33 [0.76]-[7.13]	0.957	0.98 [0.46]-[2.08]	0.11	0
Days, out of last 7, HH: Took fewer numbers of meals in a day	264	163	61.7 [45.4-78]	7	0.318	0.69 [0.33]-[1.46]	0.092	5.84 [0.74]-[46.43]	0.404	0.76 [0.38]-[1.49]	0.821	0
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	265	62	23.4 [7.2-39.6]	9.2	0.737	0.88 [0.41]-[1.91]	0.265	0.35 [0.05]-[2.30]	0.46	0.75 [0.35]-[1.63]	0.662	1
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	264	123	46.6 [29.7-63.5]	7.1	0.707	0.86 [0.37]-[1.97]	0.036	4.83 [1.12]-[20.89]	0.982	0.99 [0.47]-[2.10]	0.862	1
Days, out of last 7, HH: Consumed spoilt or left-over foods	267	9	3.4 [-0.7-7.5]	3.3	0.159	1.77 [0.79]-[3.98]	.	1 [1.00]-[1.00]	0.266	1.56 [0.70]-[3.49]	0.655	0
WASH: Main source of drinking water unprotected	293	0			.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	
WASH: Toilet used by most members of the household	293	1	0.3 [-0.4-1]	1	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	1 [1.00]-[1.00]	.	

ANNEX D: LINEAR REGRESSION

Table 35: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2014 (FSNAU)

Risk factor _Linear Regression_					GAM [W/H] _Children 6-59 months_			GAM [MUAC] _Children 6-59 months_			Stunting [H/A] _Children 6-59 months_			U _C_
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value
Childs age	493	29.7 [28.3]-[31.0]	0.65	1	0.747	-0.001	0.003	0	0.036	0.003	0.004	0.012	0.004	0.016
Size of members in HH	566	4.7 [4.3]-[5.1]	0.2	3.2	0.27	-0.019	0.017	0.453	0.011	0.014	0.531	-0.013	0.02	0.126
Number of children <5 yrs in HH	572	0.9 [0.8]-[1.0]	0.05	2	0.361	0.06	0.065	0.386	0.059	0.067	0.546	0.051	0.083	0.337
Percentage of spending on food	320	77.3 [73.9]-[80.7]	1.66	4.1	0.5	0.005	0.007	0.192	-0.007	0.005	0.364	0.007	0.007	0.237
Amount of savings	318	1.2 [0.4]-[1.9]	0.37	4.1	0.302	0.02	0.019	0.392	0.02	0.023	0.011	-0.076	0.028	0.294
Number of food groups consumed by HH	572	2.9 [2.6]-[3.1]	0.13	1.4	0.156	-0.023	0.016	0.879	0.003	0.018	0.448	-0.016	0.02	0.114
Days, out of last 7, HH consumed: Cereals	325	6.6 [6.4]-[6.7]	0.09	2.4	0.847	0.018	0.093	0.533	-0.054	0.086	0.993	0.001	0.059	0.781
Days, out of last 7, HH consumed: White Roots And Tubers	325	1.9 [1.3]-[2.5]	0.28	3.4	0.247	-0.022	0.019	0.149	-0.029	0.02	0.142	0.044	0.029	0.671
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	325	0.1 [0.0]-[0.3]	0.06	1.6	0.001	0.13	0.037	0.729	0.024	0.069	0.468	0.057	0.077	0.01
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	325	0.2 [0.0]-[0.3]	0.07	2	0.477	-0.044	0.061	0.75	-0.028	0.088	0.23	0.054	0.044	0.945
Days, out of last 7, HH consumed: Other Vegetables	325	2.1 [1.5]-[2.7]	0.31	3.8	0.102	0.038	0.023	0.33	-0.026	0.026	0.665	-0.015	0.033	0.494
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	325	0 [-0.0]-[0.1]	0.02	1	0	-0.19	0.01	0	-0.117	0.008	0.214	-0.019	0.015	0
Days, out of last 7, HH consumed: Other Fruits	325	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0	.	.
Days, out of last 7, HH consumed: Organ Meat	325	0 [-0.0]-[0.1]	0.02	2	0	-0.117	0.017	0	0.161	0.015	0	0.207	0.026	0.054
Days, out of last 7, HH consumed: Flesh Meats	325	0.2 [-0.1]-[0.4]	0.12	10	0.545	-0.025	0.041	0.091	-0.152	0.087	0	-0.26	0.062	0.001
Days, out of last 7, HH consumed: Eggs	325	0 [-0.0]-[0.1]	0.02	1.6	0.757	-0.042	0.133	0.172	-0.257	0.184	0.859	-0.028	0.156	0.773
Days, out of last 7, HH consumed: Fish And Seafood	325	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0	.	.
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	325	3.2 [2.0]-[4.3]	0.56	2.5	0.031	-0.012	0.005	0.027	-0.011	0.005	0.641	0.003	0.006	0.071
Days, out of last 7, HH consumed: Milk And Milk Products	325	0.2 [0.0]-[0.3]	0.06	1.5	0.494	-0.043	0.062	0.269	0.091	0.081	0.028	0.076	0.033	0.698
Days, out of last 7, HH consumed: Oils And Fats	325	5.6 [5.2]-[5.9]	0.18	2.1	0.523	0.021	0.032	0.071	-0.049	0.026	0.091	0.046	0.026	0.071
Days, out of last 7, HH consumed: Sweets	325	6 [5.5]-[6.4]	0.21	3.7	0.654	0.016	0.035	0.399	-0.026	0.03	0.052	0.059	0.029	0.073
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	325	5.1 [4.6]-[5.7]	0.28	3.2	0.402	-0.022	0.026	0.486	-0.016	0.022	0.358	-0.027	0.029	0.236
Days, out of last 7, HH consumed: Any veg	325	0.8 [0.6]-[1.0]	0.11	3.7	0.03	0.109	0.048	0.34	-0.061	0.062	0.949	-0.006	0.09	0.28
Days, out of last 7, HH consumed: Any fruit	325	0 [-0.0]-[0.0]	0.01	1	0	-0.381	0.02	0	-0.233	0.017	0.214	-0.038	0.03	0

Days, out of last 7, HH consumed: Any meat	325	0.1 [-0.0]-[0.2]	0.06	8.5	0.193	-0.089	0.067	0.259	-0.178	0.155	0.183	-0.334	0.245	0.08
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	327	0.8 [0.5]-[1.2]	0.18	6.1	0.666	-0.022	0.05	0.023	-0.105	0.044	0.63	-0.03	0.061	0.391
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	327	1.1 [0.7]-[1.4]	0.18	4.8	0.833	-0.009	0.041	0.005	-0.131	0.043	0.893	-0.007	0.049	0.733
Days, out of last 7, HH: Took fewer numbers of meals in a day	327	1.2 [0.9]-[1.6]	0.19	4.1	0.088	-0.064	0.036	0.012	-0.111	0.041	0.642	-0.025	0.053	0.17
Days, out of last 7, HH: Borrowed food on credit from the shop/market	327	1.5 [1.1]-[1.9]	0.18	5.1	0.928	-0.005	0.054	0.199	-0.057	0.043	0.406	0.049	0.058	0.598
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	327	0.7 [0.5]-[0.9]	0.11	3.5	0.834	-0.016	0.078	0.177	-0.087	0.063	0.888	-0.014	0.098	0.636
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	327	0.2 [0.1]-[0.3]	0.05	3	0.235	-0.117	0.096	0.01	0.218	0.079	0.542	-0.084	0.136	0.163
Days, out of last 7, HH: Relied on food donations from relatives	327	0.2 [0.1]-[0.3]	0.05	1.8	0.329	-0.149	0.15	0.555	-0.084	0.141	0.342	-0.078	0.081	0.298
Days, out of last 7, HH: Relied on food donations from the clan/community	327	0.1 [0.0]-[0.2]	0.04	2.2	0	-0.234	0.057	0.099	-0.233	0.137	0.447	0.115	0.149	0.195
Days, out of last 7, HH: Sought or rely on food aid from humanitarian agency	327	0.1 [-0.0]-[0.2]	0.05	5.6	0.411	-0.111	0.133	0.531	-0.1	0.158	0.013	-0.584	0.221	0
Days, out of last 7, HH: Sent household members to eat elsewhere	327	0.2 [0.1]-[0.4]	0.06	1.7	0.033	-0.253	0.113	0.196	-0.125	0.094	0.855	0.017	0.09	0.06
Days, out of last 7, HH: Begged for food	327	0 [-0.0]-[0.0]	0.01	0.9	0	0.856	0.071	0	-0.816	0.059	0	-1.178	0.104	0.346
Days, out of last 7, HH: Skipped entire days without eating	327	0.1 [-0.0]-[0.2]	0.05	3.2	0	-0.229	0.038	0.041	0.144	0.067	0.037	0.129	0.059	0.064
Days, out of last 7, HH: Consumed spoilt or left-over foods	327	0 [-0.0]-[0.0]	0.01	2.1	0	-0.299	0.035	0	-0.46	0.029	0.047	-0.11	0.053	0
Mother's age	565	29 [28.1]-[29.9]	0.46	1.9	0.098	0.009	0.005	0.313	0.007	0.006	0.68	-0.003	0.007	0.35
Mother's MUAC	569	24.4 [24.1]-[24.8]	0.17	5.2	0.165	0.042	0.029	0.052	0.061	0.03	0.996	0	0.035	0.287
Number of Tet vaccine	571	2 [1.8]-[2.2]	0.1	4.5	0.342	-0.044	0.045	0.06	-0.074	0.038	0.859	-0.008	0.045	0.276

Table 36: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2015 (FSNAU)

Risk factor *Linear Regression*					GAM [W/H] *Children 6-59 months*			GAM [MUAC] *Children 6-59 months*			Stunting [H/A] *Children 6-59 months*		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE
Childs age	712	32.6 [31.6]-[33.5]	0.46	0.6	0.041	-0.006	0.003	0	0.039	0.003	0	0.017	0.004
Size of members in HH	703	6.9 [6.4]-[7.3]	0.24	6.1	0.189	-0.029	0.022	0.806	-0.006	0.024	0.013	-0.086	0.033
Number of children <5 yrs in HH	712	1 [0.8]-[1.1]	0.06	4.3	0.667	0.027	0.062	0.048	-0.127	0.062	0.749	-0.023	0.071
Percentage of spending on food	321	77.4 [75.6]-[79.2]	0.9	4.6	0.085	0.016	0.009	0.182	0.01	0.007	0.212	-0.015	0.012
Amount of savings	321	0.2 [-0.0]-[0.3]	0.08	2.3	0.221	0.101	0.081	0.175	-0.077	0.056	0.562	0.074	0.126
Number of food groups consumed by HH	712	0.4 [0.3]-[0.5]	0.05	4	0.487	0.063	0.09	0.327	0.061	0.061	0.867	0.018	0.105
Days, out of last 7, HH consumed: Cereals	316	5.2 [4.6]-[5.7]	0.26	6.3	0.976	-0.001	0.05	0.141	0.039	0.026	0.047	0.123	0.06
Days, out of last 7, HH consumed: White Roots And Tubers	147	5 [4.2]-[5.8]	0.38	5	0.14	0.072	0.047	0.105	0.062	0.036	0.44	0.064	0.081
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	25	3.2 [2.1]-[4.4]	0.49	0.9	0.417	0.081	0.094	0.514	0.055	0.081	0.001	0.287	0.051
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	13	1.9 [0.7]-[3.2]	0.51	1.5	0.903	-0.05	0.391	0.602	-0.119	0.217	0.086	0.607	0.296
Days, out of last 7, HH consumed: Other Vegetables	119	4.4 [3.8]-[5.1]	0.33	4	0.335	0.089	0.091	0.397	-0.044	0.052	0.822	-0.019	0.086
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	16	2.6 [1.3]-[3.8]	0.47	0.8	0.099	0.123	0.061	0.322	0.17	0.154	0.023	0.248	0.077
Days, out of last 7, HH consumed: Other Fruits	33	2.7 [1.3]-[4.1]	0.61	4.4	0.599	-0.068	0.124	0.625	-0.051	0.102	0.45	-0.19	0.24
Days, out of last 7, HH consumed: Organ Meat	21	2.2 [1.2]-[3.2]	0.43	1.1	0.836	-0.017	0.079	0.265	0.115	0.095	0.037	0.37	0.144
Days, out of last 7, HH consumed: Flesh Meats	34	3.3 [2.5]-[4.0]	0.34	1.1	0.889	0.011	0.08	0.444	0.047	0.059	0.02	-0.227	0.082
Days, out of last 7, HH consumed: Eggs	17	2.9 [0.6]-[5.2]	0.73	1.9	0.715	0.034	0.084	0.118	0.122	0.056	0.084	-0.261	0.103
Days, out of last 7, HH consumed: Fish And Seafood	24	3.2 [2.0]-[4.4]	0.48	1.5	0.219	0.117	0.083	0.489	-0.053	0.071	0.309	-0.215	0.19
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	201	4.4 [3.8]-[5.0]	0.29	4.5	0.909	0.007	0.064	0.732	0.015	0.042	0.076	0.099	0.054
Days, out of last 7, HH consumed: Milk And Milk Products	57	4.2 [2.6]-[5.8]	0.74	5	0.299	0.051	0.047	0.492	0.022	0.032	0.015	0.187	0.066
Days, out of last 7, HH consumed: Oils And Fats	273	4.6 [4.0]-[5.1]	0.27	4.9	0.329	0.049	0.05	0.053	0.047	0.023	0.038	0.094	0.043
Days, out of last 7, HH consumed: Sweets	288	5 [4.5]-[5.6]	0.27	5.7	0.481	0.037	0.052	0.302	0.03	0.028	0.181	0.072	0.052
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	221	5.2 [4.3]-[6.0]	0.4	7.6	0.906	0.007	0.06	0.196	0.049	0.037	0.434	-0.052	0.066
Days, out of last 7, HH consumed: Any veg	5	0.9 [-3.5]-[5.3]	0.35	2.4	0.269	-1.546	0.696	0.378	-0.933	0.63	0.453	0.127	0.109
Days, out of last 7, HH consumed: Any fruit	10	1.8 [0.4]-[3.1]	0.44	2.3	0.085	-0.516	0.204	0.006	-0.669	0.096	0.233	0.149	0.1
Days, out of last 7, HH consumed: Any meat	8	2.1 [0.3]-[3.8]	0.54	2.1	0.453	0.329	0.383	0.303	0.179	0.144	0.53	-0.335	0.474
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	301	0.9 [0.6]-[1.3]	0.18	6.4	0.184	-0.087	0.064	0.908	0.008	0.065	0.572	-0.048	0.083

Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	307	1 [0.6]-[1.4]	0.18	5.6	0.908	0.007	0.062	0.946	0.004	0.06	0.645	-0.041	0.087
Days, out of last 7, HH: Took fewer numbers of meals in a day	305	0.7 [0.3]-[1.1]	0.2	7.9	0.734	-0.018	0.052	0.913	0.006	0.056	0.561	-0.05	0.085
Days, out of last 7, HH: Borrowed food on credit from the shop/market	308	1.2 [0.9]-[1.6]	0.18	5.2	0.203	-0.076	0.059	0.46	-0.036	0.048	0.343	-0.061	0.064
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	308	0.9 [0.5]-[1.3]	0.19	7.5	0.083	-0.11	0.061	0.048	-0.079	0.038	0.667	-0.036	0.082
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	307	0.7 [0.3]-[1.0]	0.18	7.2	0.197	-0.083	0.063	0.349	-0.056	0.059	0.643	-0.041	0.087
Days, out of last 7, HH: Relied on food donations from relatives	308	0.3 [0.2]-[0.5]	0.08	2.3	0.077	-0.109	0.059	0.392	-0.044	0.05	0.975	-0.003	0.105
Days, out of last 7, HH: Relied on food donations from the clan/community	307	0.2 [0.1]-[0.4]	0.09	4.3	0.005	-0.198	0.065	0.06	-0.098	0.05	0.969	0.006	0.149
Days, out of last 7, HH: Sought or rely on food aid from humanitarian agencie	308	0.2 [0.0]-[0.4]	0.08	4.7	0.008	-0.17	0.06	0.002	-0.158	0.047	0.448	0.088	0.114
Days, out of last 7, HH: Sent household members to eat elsewhere	309	0.2 [0.1]-[0.3]	0.05	1.5	0.251	-0.078	0.066	0.34	-0.083	0.085	0.16	-0.219	0.152
Days, out of last 7, HH: Begged for food	307	0 [-0.0]-[0.1]	0.04	3	0	-0.114	0.024	0	-0.098	0.015	0.096	0.055	0.032
Days, out of last 7, HH: Skipped entire days without eating	309	0.2 [0.1]-[0.3]	0.05	1.7	0.931	-0.01	0.118	0.908	0.01	0.085	0.673	0.07	0.164
Days, out of last 7, HH: Consumed spoilt or left-over foods	304	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0	.
Mother's age	410	28.4 [27.5]-[29.4]	0.46	1.7	0.221	-0.01	0.008	0.001	0.028	0.008	0.36	0.009	0.01
Mother's MUAC	411	25 [24.6]-[25.5]	0.22	3.3	0.567	-0.018	0.031	0.017	0.051	0.02	0.956	0.002	0.038
Number of Tet vaccine	411	1.5 [1.2]-[1.7]	0.13	4.9	0.66	-0.027	0.06	0.776	0.013	0.044	0.967	0.002	0.06

Table 37: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2016 (FSNAU)

Risk factor					GAM [W/H]			GAM [MUAC]			Stunting [H/A]			Underwe	
Linear Regression					Children 6-59 months			Children 6-59 months			Children 6-59 months			Children 6	
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coef
Childs age	707	31.5 [30.4]-[32.6]	0.53	0.8	0	-0.018	0.003	0	0.033	0.002	0	0.022	0.004	0.792	0.00
Size of members in HH	669	4.1 [3.8]-[4.4]	0.14	3	0.69	-0.012	0.03	0.431	0.016	0.019	0.037	0.066	0.03	0.266	0.02
Number of children <5 yrs in HH	707	1 [0.9]-[1.0]	0.04	1.6	0.727	0.018	0.052	0.962	-0.003	0.061	0.042	0.101	0.048	0.198	0.05
Percentage of spending on food	304	72.6 [69.5]-[75.8]	1.53	1.6	1	0	0.007	0.659	-0.003	0.006	0.894	-0.001	0.007	0.977	0
Number of food groups consumed by HH	707	2.7 [2.4]-[3.0]	0.15	1.6	0.228	0.021	0.017	0.328	0.014	0.014	0.982	0	0.016	0.328	0.01
Days, out of last 7, HH consumed: Cereals	707	2.8 [2.5]-[3.1]	0.15	1.5	0.576	0.01	0.017	0.555	0.008	0.014	0.722	0.005	0.015	0.509	0.0
Days, out of last 7, HH consumed: White Roots And Tubers	707	1.6 [1.3]-[2.0]	0.17	3.3	0.352	0.016	0.017	0.61	0.013	0.025	0.373	0.018	0.02	0.174	0.02
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	707	0.1 [0.0]-[0.2]	0.05	2.9	0.059	-0.113	0.058	0	-0.158	0.032	0.012	-0.146	0.054	0.007	-0.1
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	707	0.1 [0.0]-[0.1]	0.03	1.3	0.485	0.086	0.121	0.572	-0.032	0.055	0.436	-0.07	0.088	0.815	0.02
Days, out of last 7, HH consumed: Other Vegetables	707	0.9 [0.5]-[1.2]	0.18	5.4	0.368	-0.025	0.027	0.943	-0.002	0.031	0.704	-0.01	0.025	0.427	-0.02
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	707	0 [-0.0]-[0.1]	0.01	3.1	0.494	-0.134	0.193	0.385	0.103	0.117	0.001	0.475	0.123	0.1	0.16
Days, out of last 7, HH consumed: Other Fruits	707	0.1 [0.0]-[0.2]	0.04	5.7	0.287	-0.153	0.141	0.051	-0.106	0.052	0.009	0.162	0.057	0.731	-0.02
Days, out of last 7, HH consumed: Organ Meat	707	0.1 [0.0]-[0.1]	0.02	2.7	0.047	-0.325	0.156	0.022	-0.1	0.041	0.54	-0.121	0.194	0.008	-0.29
Days, out of last 7, HH consumed: Flesh Meats	707	0.1 [0.0]-[0.3]	0.05	5.7	0.204	-0.122	0.094	0.483	-0.051	0.072	0.926	-0.009	0.097	0.194	-0.10
Days, out of last 7, HH consumed: Eggs	707	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0	.	.	0
Days, out of last 7, HH consumed: Fish And Seafood	707	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0	.	.	0
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	707	1.6 [1.3]-[1.9]	0.14	2.3	0.036	0.056	0.025	0.373	0.016	0.018	0.885	-0.003	0.019	0.084	0.03
Days, out of last 7, HH consumed: Milk And Milk Products	707	0.4 [0.1]-[0.6]	0.13	6.2	0.307	0.052	0.05	0.076	0.046	0.025	0.046	0.073	0.035	0.067	0.07
Days, out of last 7, HH consumed: Oils And Fats	707	2.4 [2.1]-[2.8]	0.16	2	0.594	0.008	0.016	0.577	0.009	0.017	0.38	-0.015	0.017	0.857	-0.00
Days, out of last 7, HH consumed: Sweets	707	2.4 [2.0]-[2.8]	0.17	2.4	0.357	0.015	0.016	0.467	0.013	0.018	0.496	-0.011	0.016	0.792	0.00
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	707	2.1 [1.7]-[2.6]	0.22	3.7	0.121	0.028	0.018	0.355	0.016	0.017	0.292	-0.015	0.014	0.446	0.01
Days, out of last 7, HH consumed: Any veg	707	0.4 [0.2]-[0.5]	0.06	4.7	0.296	-0.072	0.068	0.493	-0.055	0.08	0.23	-0.076	0.062	0.198	-0.09
Days, out of last 7, HH consumed: Any fruit	707	0.1 [0.0]-[0.1]	0.03	6.2	0.257	-0.251	0.217	0.212	-0.116	0.091	0	0.362	0.081	0.961	0.00
Days, out of last 7, HH consumed: Any meat	707	0.1 [0.0]-[0.2]	0.03	2.6	0.097	-0.258	0.15	0.289	-0.095	0.088	0.748	-0.054	0.167	0.089	-0.2

Indicator	N	Mean [CI]													
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	197	1.2 [0.9]-[1.6]	0.17	2.6	0.139	-0.083	0.054	0.045	-0.102	0.049	0.148	0.134	0.09	0.808	0.01
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	197	1.5 [0.9]-[2.1]	0.29	4.9	0.69	0.014	0.035	0.526	-0.039	0.061	0.095	0.111	0.064	0.141	0.0?
Days, out of last 7, HH: Took fewer numbers of meals in a day	195	1.6 [0.8]-[2.5]	0.42	6.4	0.872	0.007	0.045	0.192	-0.062	0.046	0.512	0.029	0.044	0.671	0.0?
Days, out of last 7, HH: Borrowed food on credit from the shop/market	197	1.2 [0.7]-[1.7]	0.23	5.9	0.953	0.004	0.074	0.136	0.096	0.062	0.155	0.089	0.061	0.286	0.06
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	197	0.9 [0.5]-[1.3]	0.18	5.4	0.443	-0.072	0.092	0.453	0.055	0.072	0.056	0.201	0.101	0.346	0.07
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	197	0.4 [0.2]-[0.7]	0.12	3.4	0.521	0.049	0.075	0.149	0.117	0.079	0.474	0.095	0.131	0.342	0.09
Days, out of last 7, HH: Relied on food donations from relatives	197	0.8 [0.4]-[1.2]	0.19	5.3	0.73	0.02	0.058	0.069	0.12	0.063	0.509	0.047	0.07	0.383	0.0?
Days, out of last 7, HH: Relied on food donations from the clan/community	197	0.4 [0.1]-[0.7]	0.13	3.8	0.206	0.092	0.071	0.043	0.168	0.079	0.267	0.082	0.072	0.059	0.11
Days, out of last 7, HH: Sought or rely on food aid from humanitarian agencie	197	0.1 [-0.0]-[0.3]	0.07	2.8	0.17	0.121	0.086	0.167	0.115	0.081	0.281	0.122	0.111	0.027	0.16
Days, out of last 7, HH: Sent household members to eat elsewhere	197	0 [-0.0]-[0.1]	0.03	2.1	0.006	-0.287	0.095	0.042	0.127	0.059	0.077	0.299	0.163	0.778	-0.0?
Days, out of last 7, HH: Begged for food	197	0.1 [-0.1]-[0.2]	0.05	3	0	-0.148	0.029	0	0.174	0.027	0	0.245	0.031	0.07	0.05
Days, out of last 7, HH: Skipped entire days without eating	196	0.1 [-0.1]-[0.2]	0.06	2.1	0.03	-0.134	0.059	0.001	0.094	0.024	0.002	0.178	0.053	0.569	0.01
Days, out of last 7, HH: Consumed spoilt or left-over foods	197	0.1 [-0.1]-[0.2]	0.07	2.1	0	-0.15	0.015	0	0.07	0.014	0	0.183	0.016	0.794	0.00

Table 38: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2017 (FSNAU)

Risk factor *Linear Regression*					GAM [W/H] *Children 0-59 months*			GAM [MUAC] *Children 0-59 months*			Stunting [H/A] *Children 0-59 mon*	
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.
Childs age	578	31 [29.6]-[32.4]	0.67	1.2	0	-0.017	0.004	0	0.323	0.035	0.292	0.005
Size of members in HH	724	5.6 [5.4]-[5.9]	0.12	2.3	0.564	-0.017	0.029	0.927	0.019	0.21	0.799	0.006
Number of children <5 yrs in HH	726	0.8 [0.7]-[0.9]	0.05	2.6	0.624	0.028	0.057	0.935	0.046	0.551	0.441	0.058
Percentage of spending on food	352	72.5 [70.0]-[74.9]	1.2	2.5	0.309	-0.008	0.007	0.789	0.011	0.041	0.175	0.007
Amount of savings	339	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0
Number of food groups consumed by HH	726	3.4 [3.2]-[3.6]	0.12	0.7	0.59	-0.007	0.012	0.329	0.091	0.092	0.932	-0.002
Days, out of last 7, HH consumed: Cereals	352	6.8 [6.7]-[7.0]	0.07	2.4	0.705	-0.041	0.107	0.55	0.475	0.783	0.385	0.167
Days, out of last 7, HH consumed: White Roots And Tubers	352	3.9 [2.9]-[4.9]	0.47	8.4	0.002	0.089	0.026	0.928	0.023	0.251	0.013	-0.082
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	352	0.1 [0.0]-[0.2]	0.05	1.9	0.603	0.028	0.054	0.018	2.015	0.797	0.41	0.312
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	352	0.1 [0.0]-[0.2]	0.05	1.9	0.138	0.159	0.104	0.024	1.462	0.611	0.922	-0.017
Days, out of last 7, HH consumed: Other Vegetables	352	3.8 [3.3]-[4.4]	0.27	3.5	0.832	0.008	0.038	0.968	0.014	0.35	0.463	-0.025
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	352	0 [-0.0]-[0.1]	0.02	1	0.93	0.006	0.071	0.886	-0.168	1.161	0.963	0.002
Days, out of last 7, HH consumed: Other Fruits	352	0.1 [0.0]-[0.2]	0.05	6	0.135	-0.171	0.111	0.926	-0.106	1.125	0.022	0.203
Days, out of last 7, HH consumed: Organ Meat	352	0.1 [0.0]-[0.2]	0.04	1.5	0.628	-0.034	0.069	0.649	-0.532	1.155	0.62	0.067
Days, out of last 7, HH consumed: Flesh Meats	352	0.7 [0.4]-[1.1]	0.17	5.5	0.179	-0.062	0.045	0.035	-0.953	0.429	0.475	0.051
Days, out of last 7, HH consumed: Eggs	352	0.2 [0.0]-[0.3]	0.08	5.4	0.918	0.009	0.087	0.734	-0.169	0.492	0.635	0.068
Days, out of last 7, HH consumed: Fish And Seafood	352	0.1 [0.0]-[0.1]	0.03	2.1	0.306	0.124	0.118	0.021	4.034	1.65	0.825	-0.038
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	352	3.9 [3.2]-[4.5]	0.31	4	0.36	0.024	0.025	0.438	0.192	0.244	0.17	-0.049
Days, out of last 7, HH consumed: Milk And Milk Products	352	0.6 [0.3]-[1.0]	0.17	4.8	0.999	0	0.065	0.833	0.1	0.468	0.931	-0.007
Days, out of last 7, HH consumed: Oils And Fats	352	6.5 [6.3]-[6.7]	0.09	2	0.184	-0.068	0.05	0.479	-0.489	0.681	0.826	-0.014
Days, out of last 7, HH consumed: Sweets	352	5.4 [4.8]-[6.1]	0.32	5.8	0.105	-0.057	0.034	0.27	-0.311	0.276	0.59	0.021
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	352	6.8 [6.7]-[6.9]	0.06	1.7	0.731	0.029	0.082	0.96	-0.03	0.585	0.557	0.056
Days, out of last 7, HH consumed: Any veg	352	1.3 [1.2]-[1.5]	0.1	3.4	0.635	0.051	0.106	0.684	0.387	0.941	0.518	-0.056
Days, out of last 7, HH consumed: Any fruit	352	0.1 [0.0]-[0.1]	0.03	3.3	0.401	-0.141	0.166	0.873	-0.277	1.723	0.282	0.178
Days, out of last 7, HH consumed: Any meat	352	0.4 [0.2]-[0.6]	0.09	4.5	0.185	-0.096	0.07	0.045	-1.48	0.704	0.448	0.088
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	352	2.8 [1.8]-[3.7]	0.46	9.5	0.778	-0.008	0.027	0.285	-0.227	0.208	0.605	0.015

Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	352	1.5 [0.6]-[2.4]	0.42	10.8	0.284	-0.032	0.029	0.07	-0.448	0.238	0.389	0.027
Days, out of last 7, HH: Took fewer numbers of meals in a day	352	1.8 [0.8]-[2.7]	0.45	10.6	0.516	-0.018	0.027	0.043	-0.465	0.219	0.525	0.019
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	352	0.2 [0.0]-[0.3]	0.06	1.8	0.109	-0.095	0.057	0.18	-0.555	0.403	0.513	0.048
Days, out of last 7, HH: Relied on food donations from relatives	352	1.7 [1.3]-[2.1]	0.21	5	0.406	-0.036	0.043	0.256	-0.396	0.341	0.884	0.009
Days, out of last 7, HH: Consumed spoilt or left-over foods	352	0 [-0.0]-[0.0]	0.01	1	0.299	-0.049	0.046	0	6.094	0.353	0	0.492

Table 39: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2018 (FSNAU)

Risk factor _Linear Regression_					GAM [W/H] _Children 0-59 months_			GAM [MUAC] _Children 0-59 months_			Stunting [H/A] _Children 0-59 months_			
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE	P-va
Child age	707	31.5 [30.4]-[32.6]	0.53	0.8	0	-0.018	0.003	0	-0.003	0	0	0.019	0.004	0.4

Table 40: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2019 (FSNAU)

Risk factor *Linear Regression*					GAM [W/H] *Children 0-59 months*			GAM [MUAC] *Children 0-59 months*			Stunting [H/A] *Children 0-59 mon*	
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.
Childs age	599	30.3 [29.4]-[31.3]	0.46	0.5	0.005	-0.011	0.004	0	0.41	0.032	0.043	0.008
Size of members in HH	599	6.1 [5.8]-[6.5]	0.16	3.4	0.323	-0.021	0.02	0.062	0.54	0.277	0.182	-0.039
Number of children <5 yrs in HH	599	1 [0.9]-[1.2]	0.05	2.6	0.901	0.008	0.061	0.822	0.143	0.631	0.472	-0.061
Percentage of spending on food	261	70.1 [67.7]-[72.5]	1.17	5.4	0.66	0.004	0.009	0.301	0.136	0.129	0.336	0.011
Amount of savings	169	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0
Number of days child experienced diarrhoea	399	0.5 [0.3]-[0.7]	0.11	1.7	0.54	-0.033	0.054	0	-1.854	0.423	0.437	-0.04
Number of food groups consumed by HH	599	2.1 [2.0]-[2.3]	0.08	0.6	0.607	-0.01	0.019	0.353	-0.318	0.337	0.734	-0.008
Days, out of last 7, HH consumed: Cereals	261	6.8 [6.6]-[6.9]	0.06	3.3	0.036	0.211	0.096	0.188	2.033	1.505	0.262	0.154
Days, out of last 7, HH consumed: White Roots And Tubers	261	2.5 [1.9]-[3.2]	0.33	5	0.745	-0.01	0.03	0.564	0.168	0.287	0.021	-0.089
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	261	0.1 [-0.0]-[0.1]	0.04	2.7	0.142	-0.139	0.092	0.037	-3.498	1.598	0.434	-0.125
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	261	0.3 [0.1]-[0.5]	0.09	2.8	0.773	-0.012	0.042	0.489	0.408	0.581	0.606	-0.055
Days, out of last 7, HH consumed: Other Vegetables	261	3 [2.6]-[3.4]	0.19	2.2	0.948	0.003	0.047	0.414	0.497	0.599	0.306	-0.053
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	261	0.1 [0.0]-[0.2]	0.04	3.2	0.8	-0.05	0.194	0.727	-0.766	2.175	0.208	-0.42
Days, out of last 7, HH consumed: Other Fruits	261	0.4 [0.2]-[0.5]	0.09	3.7	0.248	-0.11	0.093	0.464	0.809	1.088	0.152	-0.172
Days, out of last 7, HH consumed: Organ Meat	261	0.2 [0.1]-[0.4]	0.07	3.5	0.267	0.185	0.163	0.335	1.095	1.116	0.077	-0.281
Days, out of last 7, HH consumed: Flesh Meats	261	1 [0.6]-[1.3]	0.17	5.4	0.601	-0.038	0.071	0.779	-0.136	0.482	0.034	-0.182
Days, out of last 7, HH consumed: Eggs	261	0.3 [0.1]-[0.4]	0.08	1.9	0.97	0.003	0.082	0.006	2.47	0.837	0.989	0.001
Days, out of last 7, HH consumed: Fish And Seafood	261	0.3 [0.1]-[0.4]	0.08	1.7	0.086	-0.121	0.068	0.975	-0.035	1.084	0.038	0.127
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	261	3.2 [2.8]-[3.5]	0.19	1.6	0.984	-0.001	0.034	0.23	0.346	0.281	0.448	-0.028
Days, out of last 7, HH consumed: Milk And Milk Products	261	0.4 [0.1]-[0.7]	0.13	1.7	0.611	-0.043	0.084	0.891	0.111	0.807	0.18	-0.156
Days, out of last 7, HH consumed: Oils And Fats	261	6.7 [6.6]-[6.8]	0.07	1.7	0.557	-0.033	0.056	0.416	-0.764	0.925	0.758	0.026
Days, out of last 7, HH consumed: Sweets	261	6.5 [6.3]-[6.8]	0.1	1.9	0.986	0.001	0.07	0.218	-0.665	0.527	0.22	0.094
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	261	6.9 [6.8]-[7.0]	0.04	2.6	0.684	0.076	0.185	0.005	-5.301	1.719	0.747	-0.065
Days, out of last 7, HH consumed: Any veg	261	1.1 [1.0]-[1.3]	0.06	2	0.943	-0.01	0.137	0.486	1.322	1.872	0.235	-0.19
Days, out of last 7, HH consumed: Any fruit	261	0.2 [0.1]-[0.3]	0.06	4.1	0.306	-0.177	0.17	0.598	0.967	1.811	0.064	-0.38
Days, out of last 7, HH consumed: Any meat	261	0.6 [0.4]-[0.8]	0.1	5.4	0.926	0.013	0.137	0.811	0.194	0.806	0.008	-0.342

Indicator	n	Mean [95% CI]	Standard error	Design Effect	GAM [W/H] P-value	Coeff.	SE	GAM [MUAC] P-value	Coeff.	SE	Stunting [H/A] P-value	Coeff.
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	261	2.9 [2.5]-[3.4]	0.22	6.3	0.384	0.041	0.046	0.882	-0.084	0.562	0.15	0.097
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	261	1.7 [1.4]-[1.9]	0.11	2.8	0.74	0.02	0.06	0.956	0.048	0.858	0.201	0.106
Days, out of last 7, HH: Took fewer numbers of meals in a day	260	1.9 [1.6]-[2.3]	0.15	5.4	0.459	0.048	0.064	0.727	0.264	0.747	0.036	0.163
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	261	0.6 [0.4]-[0.8]	0.11	4.2	0.24	-0.104	0.087	0.825	-0.331	1.482	0.493	0.08
Days, out of last 7, HH: Relied on food donations from relatives	261	2.3 [1.8]-[2.8]	0.24	7	0.721	0.018	0.051	0.422	0.645	0.791	0.412	0.051
Days, out of last 7, HH: Consumed spoilt or left-over foods	261	0 [0.0]-[0.0]	.	0	.	0	.	.	0	.	.	0

Table 41: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Deyr season, 2020 (FSNAU)

Risk factor / Linear Regression					GAM [W/H] Children 0-59 months			GAM [MUAC] Children 0-59 months			Stunting [H/A] Children 0-59 months		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE
Childs age	625	31.3 [30.1]-[32.6]	0.6	1	0.127	-0.006	0.004	0	0.413	0.039	0.037	0.006	0.003
Mothers age	401	28.8 [28.0]-[29.6]	0.39	1	0.812	0.002	0.006	0.014	0.177	0.068	0.019	0.017	0.007
Mothers MUAC	401	129.9 [93.2]-[166.6]	17.91	8.6	0.118	-0.001	0	0.286	-0.007	0.007	0.009	0.001	0

Table 42: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Gu season, 2015 (FSNAU)

Risk factor Linear Regression					GAM [W/H] Children 6-59 months			GAM [MUAC] Children 6-59 months			Stunting [H/A] Children 6-59 months			
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value
Childs age	868	33.2 [32.1-34.1]	0.46	0.8	0.001	-0.007	0.002	0	0.039	0.003	0	0.026	0.004	0
Size of members in HH	917	6.6 [6.4-6.8]	0.24	1.8	0.069	-0.029	0.015	0.985	0	0.022	0.362	0.017	0.018	0.496
Number of children <5 yrs in HH	933	2 [1.9-2.1]	0.06	4.2	0.024	-0.107	0.045	0.433	-0.028	0.036	0.196	0.074	0.056	0.405
Percentage of spending on food	456	75.8 [74.3-77.3]	0.9	2.6	0.857	-0.001	0.006	0.485	-0.005	0.007	0.552	-0.005	0.008	0.635
Amount of savings	454	0.1 [-0.1-0.3]	0.08	1.9	0	0.049	0.008	0.007	0.033	0.011	0.253	-0.016	0.013	0.102
Age breastfeeding stopped (mnths)	166	9.8 [8.7-10.9]	0.05	1.5	0.027	-0.044	0.019	0.45	-0.009	0.012	0.035	-0.051	0.023	0.02
Age child start liqids other than breastmilk (mnths)	207	7.2 [6.6-7.8]	0.26	1.4	0.06	-0.05	0.025	0.821	0.005	0.021	0.872	0.005	0.029	0.209
age child started feeding semi solid food (mnths)	223	7.3 [6.6-7.9]	0.38	1.9	0.113	-0.051	0.031	0.339	0.02	0.02	0.756	0.012	0.037	0.205
frequency of child being fed (other than breast milk in last 24hrs?	305	3 [2.8-3.2]	0.49	2.7	0.782	-0.019	0.069	0.758	0.019	0.062	0.924	0.007	0.068	0.881
frequency of child being fed milk (other than breast milk in last 24hrs?	294	2.1 [1.8-2.5]	0.51	2.9	0.085	-0.07	0.039	0.821	-0.008	0.036	0.408	0.052	0.062	0.565
Number of days child experienced diarhea	551	0.4 [0.1-0.6]	0.33	3.8	0.001	-0.126	0.035	0	-0.247	0.044	0.001	-0.156	0.041	0
Number of food groups consumed by HH	933	2.7 [2.5-3.0]	0.47	1.6	0.288	-0.019	0.018	0.197	-0.022	0.016	0.785	-0.005	0.016	0.266
Days, out of last 7, HH consumed: Cereals	465	0.43 [0.23-0.63]	0.61	4.7	0.677	-0.018	0.043	0.356	0.036	0.039	0.036	0.101	0.045	0.291
Days, out of last 7, HH consumed: White Roots And Tubers	465	0.26 [0.12-0.39]	0.43	4.1	0.814	0.006	0.027	0.79	-0.008	0.028	0.698	-0.014	0.036	0.981
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	465	1.21 [0.81-1.62]	0.34	0	0.088	0.093	0.053	0.96	-0.002	0.041	0.47	0.062	0.085	0.121
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	40	0.2 [0.06-0.34]	0.73	0	0.472	-0.037	0.05	0.482	0.037	0.052	0.037	-0.084	0.038	0.139
Days, out of last 7, HH consumed: Other Vegetables	144	0.17 [0.04-0.3]	0.48	4.2	0.847	-0.009	0.045	0.639	0.022	0.046	0.71	-0.012	0.032	0.744
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	30	0.12 [0.04-0.2]	0.29	2.9	0.044	0.097	0.046	0.019	0.12	0.048	0.633	-0.053	0.109	0.496
Days, out of last 7, HH consumed: Other Fruits	31	0.41 [0.22-0.6]	0.74	3.5	0.259	0.145	0.126	0.773	-0.014	0.048	0.474	0.061	0.085	0.006
Days, out of last 7, HH consumed: Organ Meat	25	0.17 [0.04-0.3]	0.27	2.3	0.01	0.184	0.066	0	0.372	0.08	0.55	0.049	0.081	0.003
Days, out of last 7, HH consumed: Flesh Meats	59	0.13 [0.03-0.23]	0.27	2.4	0.457	0.039	0.051	0.758	0.015	0.05	0.93	0.002	0.026	0.531
Days, out of last 7, HH consumed: Eggs	28	2.87 [2.37-3.37]	0.4	3.7	0.088	-0.156	0.088	0.853	-0.02	0.108	0.124	-0.105	0.066	0.062
Days, out of last 7, HH consumed: Fish And Seafood	20	0.47 [0.21-0.74]	0.35	2.1	0.22	0.09	0.072	0.151	0.123	0.083	0.216	0.085	0.067	0.068
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	283	4.71 [4.21-5.2]	0.44	3.9	0.214	0.032	0.025	0.41	0.02	0.024	0.155	0.04	0.027	0.038
Days, out of last 7, HH consumed: Milk And Milk Products	58	5.13 [4.64-5.62]	0.54	3.5	0.739	-0.015	0.046	0.712	0.019	0.051	0.83	0.011	0.051	0.859
Days, out of last 7, HH consumed: Oils And Fats	422	4.87 [4.48-5.25]	0.18	4.7	0.881	0.004	0.029	0.668	0.012	0.027	0.532	0.021	0.034	0.541

Days, out of last 7, HH consumed: Sweets	438	5.4 [4.9-6.0]	0.18	5.1	0.603	0.019	0.037	0.403	0.026	0.03	0.336	0.035	0.036	0.322
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	398	5.7 [5.3-6.1]	0.2	2.6	0.521	0.016	0.025	0.227	0.03	0.024	0.887	-0.004	0.031	0.663
Days, out of last 7, HH consumed: Any fruit	6	1.8 [-1.0-4.7]	0.19	3.4	0.047	0.23	0.11	0.153	0.125	0.085	0.956	-0.009	0.16	0.048
Days, out of last 7, HH consumed: Any meat	9	2.3 [1.1-3.4]	0.18	1.9	0.173	0.119	0.085	0.179	0.144	0.104	0.666	0.019	0.044	0.149
Mother's age	791	30.5 [28.8-32.3]	0.09	2	0.869	0	0.002	0.057	0.005	0.003	0.452	0.002	0.002	0.415
Mother's MUAC	801	25.4 [24.8-25.9]	0.08	9.5	0.001	0.058	0.015	0	0.062	0.014	0.631	-0.011	0.022	0.052
Mother's number of tetanous vaccine shots	799	2 [1.8-2.2]	0.05	8	0.031	0.157	0.069	0.017	0.115	0.045	0.018	-0.138	0.054	0.55

Table 43: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Gu season, 2016 (FSNAU)

Risk factor *Linear Regression* Indicator	n	Mean [95% CI]	Standard error	Design Effect	GAM [W/H] *Children 6-59 months* P-value	Coeff.	SE	GAM [MUAC] *Children 6-59 months* P-value	Coeff.	SE	Stunting [H/A] *Children 6-59 months* P-value	Coeff.	
Childs age	868	33.2 [32.1-34.1]	0.06	0.8	0.001	-0.007	0.002	0	0.039	0.003	0	0.026	0
Size of members in HH	917	6.6 [6.4-6.8]	1.05	1.8	0.069	-0.029	0.015	0.985	0	0.022	0.362	0.017	0
Number of children <5 yrs in HH	933	2 [1.9-2.1]	0.08	4.2	0.024	-0.107	0.045	0.433	-0.028	0.036	0.196	0.074	0
Percentage of spending on food	456	75.8 [74.3-77.3]	0.05	2.6	0.857	-0.001	0.006	0.485	-0.005	0.007	0.552	-0.005	0
Amount of savings	454	0.1 [-0.1-0.3]	0.09	1.9	0	0.049	0.008	0.007	0.033	0.011	0.253	-0.016	0
Age breastfeeding stopped (mnths)	166	9.8 [8.7-10.9]	0.21	1.5	0.027	-0.044	0.019	0.45	-0.009	0.012	0.035	-0.051	0
Age child start liqids other than breastmilk (mnths)	207	7.2 [6.6-7.8]	0.52	1.4	0.06	-0.05	0.025	0.821	0.005	0.021	0.872	0.005	0
age child started feeding semi solid food (mnths)	223	7.3 [6.6-7.9]	0.48	1.9	0.113	-0.051	0.031	0.339	0.02	0.02	0.756	0.012	0
frequency of child being fed (other than breast milk in last 24hrs?	305	3 [2.8-3.2]	0.29	2.7	0.782	-0.019	0.069	0.758	0.019	0.062	0.924	0.007	0
frequency of child being fed milk (other than breast milk in last 24hrs?	294	2.1 [1.8-2.5]	0.41	2.9	0.085	-0.07	0.039	0.821	-0.008	0.036	0.408	0.052	0
Number of days child experienced diarhea	551	0.4 [0.1-0.6]	0.38	3.8	0.001	-0.126	0.035	0	-0.247	0.044	0.001	-0.156	0
Number of food groups consumed by HH	933	2.7 [2.5-3.0]	0.27	1.6	0.288	-0.019	0.018	0.197	-0.022	0.016	0.785	-0.005	0
Days, out of last 7, HH consumed: Cereals	465	0.43 [0.23-0.63]	0.72	4.7	0.677	-0.018	0.043	0.356	0.036	0.039	0.036	0.101	0
Days, out of last 7, HH consumed: White Roots And Tubers	465	0.26 [0.12-0.39]	1.08	4.1	0.814	0.006	0.027	0.79	-0.008	0.028	0.698	-0.014	0
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	465	1.21 [0.81-1.62]	0.89	0	0.088	0.093	0.053	0.96	-0.002	0.041	0.47	0.062	0
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	40	0.2 [0.06-0.34]	0.15	0	0.472	-0.037	0.05	0.482	0.037	0.052	0.037	-0.084	0
Days, out of last 7, HH consumed: Other Vegetables	144	0.17 [0.04-0.3]	0.21	4.2	0.847	-0.009	0.045	0.639	0.022	0.046	0.71	-0.012	0
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	30	0.12 [0.04-0.2]	0.15	2.9	0.044	0.097	0.046	0.019	0.12	0.048	0.633	-0.053	0
Days, out of last 7, HH consumed: Other Fruits	31	0.41 [0.22-0.6]	0.15	3.5	0.259	0.145	0.126	0.773	-0.014	0.048	0.474	0.061	0
Days, out of last 7, HH consumed: Organ Meat	25	0.17 [0.04-0.3]	0.51	2.3	0.01	0.184	0.066	0	0.372	0.08	0.55	0.049	0
Days, out of last 7, HH consumed: Flesh Meats	59	0.13 [0.03-0.23]	0.15	2.4	0.457	0.039	0.051	0.758	0.015	0.05	0.93	0.002	0
Days, out of last 7, HH consumed: Eggs	28	2.87 [2.37-3.37]	0.17	3.7	0.088	-0.156	0.088	0.853	-0.02	0.108	0.124	-0.105	0
Days, out of last 7, HH consumed: Fish And Seafood	20	0.47 [0.21-0.74]	0.22	2.1	0.22	0.09	0.072	0.151	0.123	0.083	0.216	0.085	0
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	283	4.71 [4.21-5.2]	0.14	3.9	0.214	0.032	0.025	0.41	0.02	0.024	0.155	0.04	0
Days, out of last 7, HH consumed: Milk And Milk Products	58	5.13 [4.64-5.62]	0.18	3.5	0.739	-0.015	0.046	0.712	0.019	0.051	0.83	0.011	0
Days, out of last 7, HH consumed: Oils And Fats	422	4.87 [4.48-5.25]	0.09	4.7	0.881	0.004	0.029	0.668	0.012	0.027	0.532	0.021	0

Days, out of last 7, HH consumed: Sweets	438	5.4 [4.9-6.0]	0.12	5.1	0.603	0.019	0.037	0.403	0.026	0.03	0.336	0.035	0
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	398	5.7 [5.3-6.1]	0.1	2.6	0.521	0.016	0.025	0.227	0.03	0.024	0.887	-0.004	0
Days, out of last 7, HH consumed: Any veg	3	1.9 [-7.5-11.3]	0.08	4.2	0.847	-0.026	0.136	0.639	0.066	0.139	0.71	-0.036	0
Days, out of last 7, HH consumed: Any fruit	6	1.8 [-1.0-4.7]	0.02	3.4	0.047	0.23	0.11	0.153	0.125	0.085	0.956	-0.009	0
Days, out of last 7, HH consumed: Any meat	9	2.3 [1.1-3.4]	.	1.9	0.173	0.119	0.085	0.179	0.144	0.104	0.666	0.019	0
Reduced Coping Strategy Index	273	7.7 [6.8-8.7]	.	2.8	0.643	-0.006	0.014	0.535	0.01	0.016	0.116	0.033	0
Mother's age	791	30.5 [28.8-32.3]	.	2	0.869	0	0.002	0.057	0.005	0.003	0.452	0.002	0
Mother's MUAC	801	25.4 [24.8-25.9]	0.54	9.5	0.001	0.058	0.015	0	0.062	0.014	0.631	-0.011	0
Mother's number of tetanus vaccine shots	799	2 [1.8-2.2]	0.63	8	0.031	0.157	0.069	0.017	0.115	0.045	0.018	-0.138	0

Table 44: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Gu season, 2017 (FSNAU)

Risk factor *Linear Regression*					GAM [W/H] *Children 6-59 months*			GAM [MUAC] *Children 6-59 months*			Stunting [H/A] *Children 6-59 months*			
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE	
Childs age	623	29 [27.9]-[30.2]	0.57	1	0	-0.015	0.003	0	0.037	0.003	0.075	0.007	0.004	
Size of members in HH	533	5.5 [5.3]-[5.7]	0.12	1.3	0.952	0.001	0.023	0	0.091	0.018	0.74	0.009	0.026	
Number of children <5 yrs in HH	779	1.3 [1.2]-[1.4]	0.06	1	0.116	-0.048	0.03	0	0.148	0.029	0.932	0.003	0.03	
Percentage of spending on food	281	71.9 [69.5]-[74.3]	1.17	3.3	0.449	-0.005	0.006	0.223	-0.007	0.005	0.453	0.006	0.007	
Amount of savings	281	0.2 [-0.1]-[0.5]	0.16	2.5	0.727	0.007	0.019	0.219	0.024	0.019	0.001	0.04	0.011	
Number of days child experienced diarhea	623	0.4 [0.2]-[0.5]	0.09	2	0.088	-0.053	0.03	0	-0.133	0.033	0.399	-0.021	0.025	
Number of food groups consumed by HH	779	2.2 [2.1]-[2.3]	0.06	0.3	0.233	-0.025	0.02	0	0.046	0.011	0.514	0.01	0.015	
Days, out of last 7, HH consumed: Cereals	272	6.4 [6.1]-[6.6]	0.13	3.4	0.599	-0.037	0.07	0.196	0.085	0.064	0.197	0.088	0.066	
Days, out of last 7, HH consumed: Milk And Milk Products	272	3.9 [3.2]-[4.6]	0.34	4	0.826	0.006	0.027	0.028	0.05	0.022	0.362	-0.028	0.031	
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	272	0.2 [0.1]-[0.3]	0.06	1.7	0.134	0.102	0.066	0.33	0.062	0.063	0.456	-0.12	0.158	
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	272	0.5 [0.3]-[0.7]	0.11	1.8	0.428	0.037	0.045	0.357	0.039	0.042	0.727	-0.023	0.066	
Days, out of last 7, HH consumed: Other Vegetables	272	2.5 [1.9]-[3.1]	0.29	3.6	0.648	0.018	0.038	0.193	0.04	0.03	0.793	-0.009	0.032	
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	272	0.3 [0.1]-[0.4]	0.07	2.2	0.948	-0.009	0.135	0.002	-0.31	0.088	0.159	0.12	0.083	
Days, out of last 7, HH consumed: Other Fruits	272	0.4 [0.2]-[0.6]	0.09	2.6	0.579	-0.051	0.091	0.339	-0.065	0.067	0.512	-0.06	0.091	
Days, out of last 7, HH consumed: Organ Meat	272	0.3 [0.1]-[0.4]	0.08	2.9	0.353	0.089	0.094	0.17	-0.109	0.077	0.52	0.072	0.11	
Days, out of last 7, HH consumed: Flesh Meats	271	0.7 [0.5]-[1.0]	0.11	2.3	0.276	0.075	0.067	0.828	0.019	0.087	0.88	0.009	0.061	
Days, out of last 7, HH consumed: Eggs	271	0.3 [0.1]-[0.4]	0.07	2.3	0.638	-0.048	0.101	0.33	-0.115	0.116	0.762	-0.044	0.145	
Days, out of last 7, HH consumed: Fish And Seafood	271	0.2 [0.1]-[0.3]	0.06	1.9	0.758	-0.044	0.143	0.464	0.082	0.11	0.414	0.096	0.115	
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	271	1.7 [1.2]-[2.1]	0.23	3.1	0.197	0.058	0.044	0.788	-0.01	0.036	0.562	-0.026	0.045	
Days, out of last 7, HH consumed: White Roots And Tubers	271	0.1 [0.0]-[0.2]	0.04	1	0.2	-0.1	0.076	0.187	-0.211	0.155	0.734	-0.024	0.071	
Days, out of last 7, HH consumed: Oils And Fats	272	5.6 [5.2]-[6.1]	0.22	4.2	0.545	-0.029	0.048	0.087	0.063	0.036	0.517	0.027	0.041	
Days, out of last 7, HH consumed: Sweets	272	5.1 [4.5]-[5.8]	0.32	4.8	0.414	-0.03	0.036	0.111	0.044	0.027	0.485	0.021	0.029	
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	272	5.7 [5.3]-[6.1]	0.2	2.6	0.438	-0.035	0.044	0.574	0.023	0.04	0.998	0	0.045	
Days, out of last 7, HH consumed: Any veg	272	1.1 [0.9]-[1.2]	0.08	2.2	0.278	0.105	0.095	0.067	0.153	0.08	0.342	-0.076	0.078	

Indicator	N	Mean [CI]												
Days, out of last 7, HH consumed: Any fruit	272	0.3 [0.2]-[0.5]	0.07	3.2	0.625	-0.068	0.138	0.021	-0.237	0.097	0.89	-0.015	0.109	
Days, out of last 7, HH consumed: Any meat	271	0.5 [0.3]-[0.7]	0.07	3	0.202	0.14	0.107	0.748	-0.036	0.112	0.63	0.052	0.106	
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	274	2.7 [1.9]-[3.6]	0.41	6.1	0.438	-0.03	0.038	0.86	0.004	0.024	0.84	-0.009	0.042	
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	274	1.8 [1.0]-[2.5]	0.36	6.5	0.936	0.004	0.051	0.758	-0.009	0.03	0.315	-0.061	0.06	
Days, out of last 7, HH: Took fewer numbers of meals in a day	274	1.8 [1.1]-[2.5]	0.33	6.3	0.68	-0.022	0.054	0.86	-0.006	0.033	0.462	-0.048	0.065	
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	274	0.6 [0.4]-[0.8]	0.1	2.2	0.988	-0.001	0.069	0.628	-0.029	0.058	0.123	-0.079	0.05	
Days, out of last 7, HH: Consumed spoilt or left-over foods	274	0.1 [0.1]-[0.2]	0.04	1.3	0.525	0.043	0.066	0.778	-0.026	0.09	0.825	-0.016	0.07	
Reduced Coping Strategy Index	274	8.2 [5.7]-[10.7]	1.24	5.2	0.774	-0.003	0.011	0.766	-0.002	0.007	0.339	-0.011	0.011	

Table 45: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Gu season, 2018 (FSNAU)

Risk factor *Linear Regression* Indicator	n	Mean [95% CI]	Standard error	Design Effect	GAM [W/H] *Children 6-59 months* P-value	Coeff.	SE	GAM [MUAC] *Children 6-59 months* P-value	Coeff.	SE	Stunting [H/A] *Children 6-59 months* P-value	Coeff.	SE
Childs age	623	29 [27.9]-[30.2]	0.57	1	0	-0.017	0.004	0	0.042	0.002	0	0.016	0.004
Size of members in HH	533	5.5 [5.3]-[5.7]	0.12	5.5	0.458	0.019	0.026	0.412	0.02	0.025	0.253	0.039	0.033
Number of children <5 yrs in HH	779	1.3 [1.2]-[1.4]	0.06	4.3	0.157	0.041	0.028	0.506	0.019	0.029	0.346	0.04	0.042
Percentage of spending on food	281	71.9 [69.5]-[74.3]	1.17	5.6	0.354	-0.006	0.006	0	0.025	0.006	0.997	0	0.006
Amount of savings	281	0.2 [-0.1]-[0.5]	0.16	0	.	0	.	.	0	.	.	0	.
Number of days child experienced diarrhoea	623	0.4 [0.2]-[0.5]	0.09	1.5	0.554	0.049	0.082	0	-0.22	0.033	0.349	-0.059	0.061
Number of food groups consumed by HH	779	2.2 [2.1]-[2.3]	0.06	1.2	0.733	0.006	0.019	0.915	0.002	0.017	0.185	0.027	0.02
Days, out of last 7, HH consumed: Cereals	306	6.4 [6.1]-[6.6]	0.13	2	0.787	0.015	0.055	0.301	0.125	0.119	0.827	0.028	0.128
Days, out of last 7, HH consumed: White Roots And Tubers	306	3.9 [3.2]-[4.6]	0.34	5.8	0.748	0.012	0.037	0.603	0.013	0.026	0.298	-0.04	0.038
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	306	0.2 [0.1]-[0.3]	0.06	5.2	0.171	-0.161	0.114	0.983	-0.002	0.1	0.967	-0.004	0.104
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	306	0.5 [0.3]-[0.7]	0.11	4.7	0.967	0.004	0.091	0.433	-0.079	0.1	0.646	0.064	0.138
Days, out of last 7, HH consumed: Other Vegetables	306	2.5 [1.9]-[3.1]	0.29	4.7	0.827	-0.007	0.031	0.012	0.063	0.023	0.084	0.069	0.039
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	306	0.3 [0.1]-[0.4]	0.07	6.2	0.291	-0.101	0.094	0.747	0.044	0.134	0.287	0.139	0.128
Days, out of last 7, HH consumed: Other Fruits	306	0.4 [0.2]-[0.6]	0.09	6.7	0.882	0.008	0.052	0.908	-0.006	0.051	0.009	0.199	0.071
Days, out of last 7, HH consumed: Organ Meat	306	0.3 [0.1]-[0.4]	0.08	3.5	0.512	-0.079	0.119	0.346	-0.055	0.057	0.045	0.13	0.062
Days, out of last 7, HH consumed: Flesh Meats	306	0.7 [0.5]-[1.0]	0.11	3.8	0.052	-0.07	0.034	0.189	0.031	0.023	0.316	0.044	0.043
Days, out of last 7, HH consumed: Eggs	306	0.3 [0.1]-[0.4]	0.07	3.2	0.892	0.015	0.11	0.607	-0.046	0.088	0.89	-0.019	0.139
Days, out of last 7, HH consumed: Fish And Seafood	306	0.2 [0.1]-[0.3]	0.06	3.6	0.582	0.054	0.096	0.028	-0.174	0.075	0.35	-0.105	0.11
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	306	1.7 [1.2]-[2.1]	0.23	6.2	0.079	0.048	0.026	0.448	-0.026	0.034	0.632	0.018	0.036
Days, out of last 7, HH consumed: Milk And Milk Products	306	0.1 [0.0]-[0.2]	0.04	3.6	0.504	-0.029	0.043	0.073	-0.049	0.026	0.281	0.051	0.046
Days, out of last 7, HH consumed: Oils And Fats	306	5.6 [5.2]-[6.1]	0.22	3.4	0.987	0.001	0.085	0.667	0.043	0.098	0.145	0.117	0.078
Days, out of last 7, HH consumed: Sweets	306	5.1 [4.5]-[5.8]	0.32	7.1	0.154	0.035	0.024	0.12	-0.036	0.022	0.013	-0.082	0.031
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	306	5.7 [5.3]-[6.1]	0.2	2.4	0.998	0	0.158	0.182	0.097	0.071	0.559	0.092	0.155
Days, out of last 7, HH consumed: Any veg	272	1.1 [0.9]-[1.2]	0.08	4.2	0.63	-0.046	0.095	0.017	0.162	0.064	0.037	0.216	0.099
Days, out of last 7, HH consumed: Any fruit	272	0.3 [0.2]-[0.5]	0.07	6.9	0.687	-0.036	0.087	0.885	0.012	0.082	0.018	0.329	0.131

	N												
Days, out of last 7, HH consumed: Any meat	271	0.5 [0.3]-[0.7]	0.07	3.8	0.069	-0.141	0.074	0.599	0.03	0.056	0.094	0.117	0.068
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	306	2.7 [1.9]-[3.6]	0.41	4.9	0	0.07	0.018	0.143	-0.034	0.023	0.159	-0.035	0.024
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	306	1.8 [1.0]-[2.5]	0.36	4.9	0.006	0.09	0.03	0.007	-0.079	0.027	0.38	-0.04	0.044
Days, out of last 7, HH: Took fewer numbers of meals in a day	306	1.8 [1.1]-[2.5]	0.33	5.2	0.023	0.071	0.029	0.067	-0.081	0.043	0.988	-0.001	0.056
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	306	0.6 [0.4]-[0.8]	0.1	2.4	0.031	0.105	0.046	0.67	-0.025	0.058	0.213	-0.044	0.035
Days, out of last 7, HH: Relied on food donations from relatives	306	1.62 [1.01]-[2.14]	0.26	5.6	0.004	0.101	0.032	0.28	-0.036	0.033	0.26	-0.038	0.033
Days, out of last 7, HH: Consumed spoilt or left-over foods	306	0.1 [0.1]-[0.2]	0.04	2.4	0.402	-0.247	0.29	0.093	0.654	0.376	0.203	0.102	0.079
Reduced Coping Strategy Index	306	8.2 [5.7]-[10.7]	1.24	4.5	0	0.022	0.006	0.115	-0.011	0.007	0.267	-0.009	0.008

Table 46: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Gu season, 2019 (FSNAU)

Risk factor *Linear Regression*					GAM [W/H] *Children 6-59 months*			GAM [MUAC] *Children 6-59 months*			Stunting [H/A] *Children 6-59 months*		
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.	SE
Childs age	660	31.2 [30.2]-[32.2]	0.48	0.5	0.475	-0.002	0.003	0	0.043	0.003	0.001	0.016	0.00
Size of members in HH	660	6.3 [6.0]-[6.5]	0.12	0.1	0.144	0.028	0.019	0.004	0.056	0.018	0.816	0.005	0.02
Number of children <5 yrs in HH	660	2 [1.8]-[2.2]	0.09	0.1	0.904	-0.003	0.025	0.059	0.046	0.023	0.813	-0.008	0.03
Percentage of spending on food	310	73.1 [71.5]-[74.6]	0.76	0.8	0.411	-0.007	0.008	0.568	-0.006	0.01	0.839	0.002	0.01
Amount of savings	308	0.1 [-0.0]-[0.2]	0.05	0.1	0.354	-0.045	0.048	0.002	-0.209	0.061	0.069	0.029	0.01
Number of days child experienced diarrhoea	660	0.2 [0.1]-[0.3]	0.04	0	0	-0.201	0.037	0	-0.212	0.046	0.192	-0.069	0.05
Number of food groups consumed by HH	660	1.9 [1.7]-[2.1]	0.1	0.1	0.532	0.013	0.02	0.801	0.005	0.019	0.526	0.014	0.02
Days, out of last 7, HH consumed: Cereals	310	6.6 [6.3]-[6.9]	0.15	0.2	0.27	-0.059	0.053	0.209	-0.085	0.066	0.58	0.041	0.07
Days, out of last 7, HH consumed: Milk And Milk Products	310	5.5 [4.9]-[6.1]	0.29	0.3	0.059	-0.075	0.038	0.015	-0.091	0.035	0.391	-0.043	0.04
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	310	0.2 [0.0]-[0.3]	0.07	0.1	0.538	0.039	0.063	0.239	0.09	0.074	0.735	0.024	0.06
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	310	0.3 [0.2]-[0.5]	0.09	0.1	0.736	-0.026	0.076	0.362	0.049	0.053	0.051	0.2	0.09
Days, out of last 7, HH consumed: Other Vegetables	310	4.4 [3.9]-[4.9]	0.25	0.3	0.584	0.017	0.031	0.851	-0.006	0.033	0.79	-0.012	0.04
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	310	0.1 [0.0]-[0.1]	0.03	0	0.553	0.256	0.425	0.118	0.211	0.13	0.17	0.445	0.31
Days, out of last 7, HH consumed: Other Fruits	310	0.6 [0.3]-[0.9]	0.15	0.2	0.828	0.01	0.046	0.689	-0.015	0.038	0.057	0.094	0.04
Days, out of last 7, HH consumed: Organ Meat	310	0.4 [0.2]-[0.7]	0.12	0.1	0.555	0.053	0.088	0.274	0.077	0.069	0.005	0.214	0.06
Days, out of last 7, HH consumed: Flesh Meats	310	1.3 [0.9]-[1.7]	0.21	0.2	0.725	-0.015	0.042	0.608	0.021	0.04	0.069	0.084	0.04
Days, out of last 7, HH consumed: Eggs	310	0.2 [0.1]-[0.3]	0.05	0.1	0.383	-0.075	0.085	0.003	0.233	0.072	0.211	0.153	0.12
Days, out of last 7, HH consumed: Fish And Seafood	310	0.1 [0.0]-[0.2]	0.04	0	0.592	-0.091	0.167	0.506	-0.088	0.131	0.728	-0.023	0.06
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	310	2.9 [2.2]-[3.6]	0.34	0.3	0.593	0.016	0.03	0.974	0.001	0.029	0.233	-0.04	0.03
Days, out of last 7, HH consumed: White Roots And Tubers	310	0.4 [0.2]-[0.6]	0.1	0.1	0.589	0.029	0.054	0.462	-0.036	0.048	0.967	0.002	0.05
Days, out of last 7, HH consumed: Oils And Fats	310	6.5 [6.3]-[6.8]	0.13	0.1	0.895	-0.01	0.072	0.246	-0.067	0.057	0.166	-0.124	0.08
Days, out of last 7, HH consumed: Sweets	310	5.5 [4.6]-[6.3]	0.42	0.4	0.507	0.014	0.021	0.471	-0.019	0.026	0.001	-0.114	0.03
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	310	6.7 [6.5]-[6.9]	0.09	0.1	0.209	-0.069	0.054	0.034	-0.144	0.065	0.004	-0.202	0.06
Days, out of last 7, HH consumed: Any veg	310	1.6 [1.5]-[1.8]	0.08	0.1	0.681	0.037	0.089	0.667	0.041	0.093	0.534	0.101	0.16
Days, out of last 7, HH consumed: Any fruit	310	0.3 [0.2]-[0.5]	0.08	0.1	0.651	0.049	0.107	0.975	-0.002	0.077	0.044	0.222	0.10
Days, out of last 7, HH consumed: Any meat	310	0.9 [0.6]-[1.1]	0.11	0.1	0.979	-0.002	0.086	0.346	0.067	0.069	0.001	0.229	0.06

Indicator	N	Value [CI]											
Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	310	2.8 [2.3]-[3.3]	0.26	0.3	0.329	0.029	0.029	0.809	0.009	0.039	0.191	-0.047	0.03
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	310	1.3 [1.0]-[1.6]	0.13	0.1	0.094	0.106	0.061	0.051	0.124	0.061	0.262	0.07	0.06
Days, out of last 7, HH: Took fewer numbers of meals in a day	310	1.5 [1.2]-[1.8]	0.16	0.2	0.895	0.006	0.048	0.32	0.061	0.06	0.177	0.085	0.06
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	310	0.4 [0.2]-[0.6]	0.09	0.1	0.46	0.121	0.162	0.392	0.067	0.077	0.275	-0.152	0.13
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	310	2 [1.6]-[2.3]	0.16	0.2	0.973	-0.001	0.044	0.416	0.045	0.054	0.095	0.095	0.05
Days, out of last 7, HH: Consumed spoilt or left-over foods	310	0 [-0.0]-[0.1]	0.01	0	0.001	-0.443	0.12	0.961	-0.02	0.41	0.783	0.131	0.47
Reduced Coping Strategy Index	310	8.8 [7.4]-[10.2]	0.69	0.7	0.27	0.015	0.013	0.182	0.017	0.012	0.897	0.002	0.01

Table 47: Statistical associations between risk factors and wasting, stunting and underweight demonstrated by linear regression in Gu season, 2020 (FSNAU)

Risk factor *Linear Regression*					GAM [W/H] *Children 6-59 months*			GAM [MUAC] *Children 6-59 months*			Stunting [H/A] *Children 6-59 months*	
Indicator	n	Mean [95% CI]	Standard error	Design Effect	P-value	Coeff.	SE	P-value	Coeff.	SE	P-value	Coeff.
Childs age	615	30.5	30.5 [29.3]-[31.8]	0.6	0.019	-0.011	0.004	0	0.034	0.003	0.01	-0.014
Size of members in HH	614	5.9	5.9 [5.6]-[6.3]	0.15	0.591	-0.018	0.034	0.306	-0.028	0.026	0.056	-0.053
Number of children <5 yrs in HH	615	1.7	1.7 [1.5]-[1.9]	0.11	0.885	0.007	0.045	0.976	-0.001	0.024	0.243	-0.03
Percentage of spending on food	293	71.5	71.5 [68.4]-[74.6]	1.52	0.705	0.003	0.007	0.133	0.013	0.009	0.184	0.015
Amount of savings	92	0.4	0.4 [-0.2]-[1.1]	0.32	0.734	0.07	0.201	0.87	-0.006	0.035	0.806	0.045
Number of days child experienced diarrhoea	614	0.1	0.1 [0.0]-[0.2]	0.04	0.006	-0.145	0.048	0.013	-0.177	0.067	0.981	0.001
Number of food groups consumed by HH	615	2.1	2.1 [1.9]-[2.3]	0.11	0.035	-0.048	0.021	0.817	0.005	0.022	0.331	-0.038
Days, out of last 7, HH consumed: Cereals	293	6.8	6.8 [6.7]-[6.9]	0.06	0.275	-0.224	0.201	0.002	0.438	0.127	0.075	-0.45
Days, out of last 7, HH consumed: Milk And Milk Products	293	4.5	4.5 [4.0]-[5.0]	0.25	0.31	-0.03	0.029	0.217	0.043	0.034	0.617	0.025
Days, out of last 7, HH consumed: Vitamin A Rich Vegetables	293	0.1	0.1 [0.0]-[0.2]	0.04	0.754	0.071	0.223	0.962	-0.008	0.172	0.151	0.252
Days, out of last 7, HH consumed: Dark Green Leafy Vegetables	293	0.4	0.4 [0.2]-[0.6]	0.1	0.676	-0.035	0.083	0.658	-0.025	0.056	0.058	-0.15
Days, out of last 7, HH consumed: Other Vegetables	293	3.3	3.3 [2.7]-[3.9]	0.3	0.192	0.072	0.054	0.558	0.023	0.038	0.157	0.086
Days, out of last 7, HH consumed: Vitamin A Rich Fruits	293	0.1	0.1 [0.0]-[0.2]	0.03	0.622	-0.112	0.224	0.935	-0.006	0.076	0.4	0.206
Days, out of last 7, HH consumed: Other Fruits	293	0.3	0.3 [0.1]-[0.4]	0.07	0.478	0.097	0.136	0.046	-0.205	0.098	0.397	0.139
Days, out of last 7, HH consumed: Organ Meat	293	0.2	0.2 [0.1]-[0.3]	0.05	0.427	0.105	0.13	0.015	-0.256	0.099	0.767	0.037
Days, out of last 7, HH consumed: Flesh Meats	293	1.2	1.2 [0.9]-[1.6]	0.17	0.408	0.05	0.059	0.577	-0.029	0.051	0.602	0.041
Days, out of last 7, HH consumed: Eggs	293	0.2	0.2 [0.1]-[0.3]	0.06	0.483	0.055	0.078	0.252	-0.119	0.102	0.299	-0.116
Days, out of last 7, HH consumed: Fish And Seafood	293	0.3	0.3 [0.1]-[0.5]	0.09	0.878	0.014	0.091	0.795	-0.016	0.061	0.843	0.011
Days, out of last 7, HH consumed: Legumes, Nuts And Seeds	293	4.1	4.1 [3.5]-[4.7]	0.3	0.123	-0.061	0.038	0.322	-0.023	0.022	0.735	0.016
Days, out of last 7, HH consumed: White Roots And Tubers	293	0.8	0.8 [0.4]-[1.2]	0.19	0.975	-0.002	0.052	0.319	0.03	0.03	0.078	-0.075
Days, out of last 7, HH consumed: Oils And Fats	293	6.5	6.5 [6.2]-[6.8]	0.16	0.247	-0.121	0.103	0.208	0.105	0.081	0.17	-0.132
Days, out of last 7, HH consumed: Sweets	293	6.4	6.4 [6.1]-[6.7]	0.14	0.459	-0.038	0.051	0.023	0.106	0.044	0.533	0.042
Days, out of last 7, HH consumed: Spices, Condiments, Beverages	293	6.8	6.8 [6.6]-[6.9]	0.07	0.219	-0.149	0.118	0.361	0.073	0.078	0.892	0.012
Days, out of last 7, HH consumed: Any veg	293	1.3	1.3 [1.0]-[1.5]	0.12	0.196	0.135	0.102	0.705	0.033	0.086	0.399	0.113
Days, out of last 7, HH consumed: Any fruit	293	0.2	0.2 [0.1]-[0.3]	0.04	0.816	0.062	0.266	0.083	-0.248	0.138	0.297	0.265
Days, out of last 7, HH consumed: Any meat	293	0.7	0.7 [0.5]-[0.9]	0.1	0.331	0.109	0.11	0.183	-0.107	0.078	0.579	0.078

Days, out of last 7, HH: Shifted to less preferred (low quality, less expensive) foods	265	1.7	1.7 [1.3]-[2.1]	0.2	0.384	-0.06	0.068	0.267	-0.083	0.073	0.391	-0.07	
Days, out of last 7, HH: Limited the portion/quantity consumed in a meal	265	0.6	0.6 [0.3]-[0.8]	0.12	0.879	0.009	0.058	0.106	-0.094	0.056	0.367	0.053	
Days, out of last 7, HH: Took fewer numbers of meals in a day	265	1.1	1.1 [0.8]-[1.4]	0.15	0.148	0.12	0.08	0.116	-0.137	0.084	0.87	-0.015	
Days, out of last 7, HH: Restricted consumption of adults for small children to eat?	265	0.3	0.3 [0.1]-[0.5]	0.09	0.26	0.158	0.137	0.264	0.106	0.093	0.489	-0.119	
Days, out of last 7, HH: Borrowed food on credit from another household (Amaah)?	265	0.9	0.9 [0.5]-[1.3]	0.2	0.853	-0.008	0.043	0.339	-0.062	0.064	0.301	-0.081	
Days, out of last 7, HH: Consumed spoilt or left-over foods	267	0.1	0.1 [-0.0]-[0.1]	0.03	0.597	0.112	0.209	0.759	0.044	0.142	0.158	-0.268	
Reduced Coping Strategy Index	265	5.1	5.1 [3.8]-[6.4]	0.64	0.537	0.011	0.017	0.207	-0.023	0.018	0.321	-0.019	
Mother's age	388	28.4	28.4 [27.4]-[29.4]	0.5	0.013	-0.021	0.008	0.114	0.012	0.007	0.376	0.006	
Mother's MUAC	371	25.4	25.4 [13.7]-[35.2]	1.8	0.324	0.054	0.324	0.899	0.007	0.055	0.798	0.013	

ANNEX E: QUALITATIVE STUDY GUIDE

Nutrition causal analysis Link NCA in Dollow IDP sites in Gedo Region, Somalia is commissioned by UNICEF Somalia and conducted by Action Against Hunger UK with an operational support of Action Against Hunger Somalia. The main objective of the study is to identify the drivers of persistently high levels of acute malnutrition in the study area in order to help strengthen the impact of nutritional security programming.

Name of principal researcher: Mohamed Yussuf

INVITATION: We would like you to participate in a study commissioned by UNICEF Somalia, whose programmes in country cover health and nutrition, water supply, sanitation and hygiene and basic education.

STUDY OBJETIVES: The objective of this study is to improve our understanding of causes of child undernutrition in Dollow Settlements for Internally Displaced Persons of Gedo Region. We are hoping that this study will help us to identify risk factors triggering the undernutrition in your community so that together and with the involvement of local authorities and other partners we can reduce the malnutrition in the future. The study will take place from April to May 2021 in four purposively selected communities in Dollow IDP sites.

PROCEDURE: In your community we would like to spend 6 consecutive days, starting today. We will share a detailed planning of our activities in order to facilitate the selection and mobilisation of participants for interviews and focus group discussions. The study will concern mainly parents of children under 5 years of age but other key informants may be solicited to contribute. Any person desiring to share his opinion outside of scheduled interviews and focus group discussions can approach the study team to do so. The study team would also like to conduct a number of observations and household visits in your community, if possible, in order for us to better understand your daily challenges. Focus groups discussions will be organised around themes, such as health, nutrition, care practices, water, hygiene and sanitation, food security and livelihoods, as well as gender. Each focus group discussion should be attended by 8-12 people, as outlined in the shared detailed planning. It should be noted that we will not be able to accommodate more people at the time. Participants are asked to come on time in order not to delay following focus group discussions. Do you agree to let us conduct this study in your community? Do you have any questions? If so, we will need you to appoint a community mobiliser. It needs to be someone that is known and respected by all members of your community. The role of this person will be to mobilise participants for semi-structured interviews and focus group discussions, as outlined in our detailed planning. Preferably, the selection of participants will be coordinated with you. Please note that it is preferable if selected participants attend only one focus group discussion. If they wish to contribute more than once, this is permitted only if it concerns different topics. However, we are interested in talking to as many community members possible and for this reason it would be better if more people in the village/cluster of villages were mobilised to participate. Please note that the participation of a community mobiliser will not be remunerated and needs to be fully voluntary.
Please note that there is no good or bad response to our questions, no good or bad opinion, and no good or bad way of doing things. We are sincerely interested in immersing into your daily lives and

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learning about your beliefs and practices. If you agree to participate, we will ask for about one hour of your time.

CONFIDENTIALITY: We will not ask for your name and will not share the content of our discussion with other people in your community. Your name will not appear in our study and no one will be able to identify what you shared with us.

RISKS: Unfortunately, apart from our sincere appreciation, we cannot promise you anything in exchange for your participation in this study. The participation in this study does not guarantee your selection in future Action Against Hunger activities nor should it have a negative effect on your involvement in ongoing activities. However, during focus group discussions we will share some water and snacks with you, which you may choose to take home with you, if you wish.

INFORMED CONSENT: The participation in this study is your choice. You are free to stop the interview or leave the focus group discussion at any time. Your participation is fully voluntary. If you do not wish to answer a question, you may decline to do so and we will move onto a next question. If you have any questions about us or the work we do, you can ask us any time.

SEASONAL CALENDAR[29]

A seasonal calendar is a diagram of changes over the seasons – usually over the period of 12 to months. Seasonal calendars are useful to identify seasonal patterns of change – for example, changing availability of resources, such as food or income, work and migration patterns; to explore relationships between different patterns of change – for example, the relationship between income levels and movements of key populations for work; to identify when people may be particularly vulnerable; to explore seasonal patterns of well-being and hardship and how different people are affected; or to identify when people are particularly vulnerable to infection.

During the qualitative survey, the study team will explore seasonal variations for each risk factor while the topic will be discussed. Respective risk factors will be listed on a printed template of a seasonal calendar, depicting twelve months of a universal year, aligned with 4 seasons of an Ethiopian year. During focus groups discussions, participants will be asked to define in what month each risk factor is most important and precise causes of these changes.

HISTORICAL CALENDAR

A historical calendar is a diagram that shows change over a certain period of time. For the purposes of this study, a period of 10-15 years will be considered. However, if participants mention key events dating prior the 15-year period, these will equally be noted. A historical calendar is useful for exploring change over time in a particular situation, and the reasons for change. This may include changes in behaviour, knowledge and attitudes in a community. It is also useful when exploring the consequences of a particular event or assessing the effectiveness (impact) of a project or a community initiative.

During the qualitative survey, the study team will explore historical variations for each risk factor while the topic will be discussed. Respective risk factors will be listed on a hand-drawn template of a historical calendar (A2 format), depicting 15 universal years. During focus groups discussions, participants will be asked to define in what year each risk factor was most important and precise causes of these changes. All important events that marked the life in a community in a positive or negative way, be it political, socio-economic, environmental or other, will be noted as potential triggers. The aim will be to draw trends based on the community knowledge and potentially identify correlations between various risk factors.

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[29] Participatory Learning and Action (PLA) tool no. 19 & 20 (https://www.aidsalliance.org/).

STORYTELLING[30]

Storytelling involves participants discussing 'typical' stories from their community. This approach helps to open discussions on sensitive subjects in a non-threatening way and to identify the real-life situations and issues that affect people in their community. It helps to explore how people feel about those situations and what action they would like to take.

During the qualitative survey, the study team will introduce pre-prepared real-life stories during focus group discussions to test participants' standpoint on subjects, which may be particularly sensitive, and/or test their responses given in a classic question-answer exchanges. The aim of this method will be to shift the attention from them (which may make them feel uncomfortable) and rather involve as observers and counsellors to other people in situations, which reflect their daily reality.

DAILY ACTIVITIES CHART

Daily activity charts show how people spend their time over the course of a day. They are useful to explore how men and women spend their day; to evaluate their workload and to discuss their different roles and responsibilities or to explore the factors that influence these differences.

During the qualitative survey, the study team will introduce printed images of daily activities in a given community and will asks participants of focus group discussions to place them on a timeline starting with the usual time when they get up and ending with the usual time when they go to bed. This will be done for men and women separately. Any other groups, such as children or elderly, or groups with different economic functions (farmers, herders or market sellers) may be introduced, if deemed relevant.

MEAL COMPOSITION CHART

Meal composition charts show what people usually eat over the course of a day. They are useful to explore community's perception of good nutrition and how that reflects on their eating habits now and in situations when money would not be a barrier to a procurement of desired foods. For the purpose of this study three scenarios will be considered: typical food intake during a fasting period, typical food intake during a non-fasting period and a typical food intake when money would not be a barrier.

During the qualitative survey, the study team will introduce a hand-drawn chart (A2 format), divided into three columns, representing each scenario. The participants of a focus group discussion will be asked to state how many meals a day they eat during each scenario and what actual meals they eat at those times of a day.

HOUSEHOLD EXPENSES

Household expenses is a participatory exercise, the main objective of which is to show how household income is distributed to cover its expenses. It may reveal household's priorities in terms of spending, identify harmful behaviour or decision-making mechanisms within the household.

During the qualitative survey, the study team will introduce a printed set of images representing different types of regular expenses incurred by a household in a given community. These images will be placed in front of participants. The participants will also receive a set of pebbles representing money, which a household has available to cover these expenses. The role of participants will be to distribute the income among various expense group, just as they would in a real life.

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[30] Participatory Learning and Action (PLA) tool no. 58 (https://www.aidsalliance.org/).

HEALTH JOURNEY / THERAPEUTIC ITINERARY[31]

This tool involves drawing the story of a person's health-seeking journey over a period of time. It involves tracing the development of person's health since falling ill, marking all different treatment options, which were explored in order to cure. The therapeutic itinerary is an engaging participatory exercise, which allows to open a discussion about traditional and non-traditional treatments in a non-threatening way. It also permits to explore people's understanding of current illnesses, which eventually trigger their choices. In addition, the tool allows to explore barriers of access to a biochemical treatment available in state-supported health facilities.

During the qualitative survey, the study team will introduce a blank sheet of paper (A2 format) and ask the participants to explain their typical health journey in case of current illnesses, which will be traced on a blank sheet of paper. The aim is to identify whether their knowledge of these illnesses triggers the same reaction and/or certain differences exist. A particular attention will be paid to an understanding and treatment of child undernutrition.

INTERVIEW GUIDE: INTRODUCTION TO RISK FACTORS

1. How would you describe a healthy child? (size/characteristics/behaviour)
2. What do you do to keep your child healthy? How much effort does it take to do this every day?
3. Have you observed that some parents take care of their children differently? What are they doing or not doing? Why/why not? What consequences on the growth and development of their children have you observed?
4. What challenges do parents in your community face in keeping children healthy? (Cf. Hypotheses Flashcards) What consequences do these challenges have on their health? Why?
5. How do these challenges change during the seasons? (Cf. Seasonal calendar) How have they changed over the past 10-15 years? (Cf. Historical calendar)
6. What type of child seems to be more vulnerable to health problems? (PROBE: sex/age/household composition/birth size/birth spacing/head of household/mother's characteristics (age, education, workload, well-being)/economic means/breastfeeding/feeding practices/hygiene, etc.
7. What do you think of the children in the pictures (Cf. Flashcards of childhood illnesses) Are these illnesses present in your community? Which are the most common? (PROBE: diarrhoea, fever, acute respiratory infections, malaria)
8. How does the prevalence of these diseases change during the seasons? (Cf. Seasonal calendar) How has it changed over the past 10-15 years? (Cf. Historical calendar)
9. What are the causes of these diseases? (NB: To be traced for each disease separately.)
10. How are these diseases treated? (Cf. Therapeutic route) (NB: To be traced for each disease separately.) How have the treatment options changed over the past 10-15 years? (Cf. Historical calendar)
11. How do you decide which treatment to choose? Who advises you?
12. Other than medication, how do you treat a sick child? (PROBE: breastfeeding/complementary feeding/hygiene practices - do they change with respect to care when the child is healthy?)

INTERVIEW GUIDE: HEALTH

1. Where is the nearest health centre/hospital? How long does it take you to get there? How does your access to health facilities change during the seasons? (Cf. Seasonal calendar) How has it changed over the past 10-15 years? (Cf. Historical calendar)
2. How much does it cost to get there? How much does the treatment cost? During which period of the year is it more difficult to pay health costs (Cf. Seasonal calendar)
3. What types of services are available at the nearest health centre? Which ones do you use? (PROBE: Antenatal/postnatal care, childbirth, family planning, treatment of childhood illnesses, vaccination, deworming, vitamin supplementation) Why? What health services are not culturally

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[31] Participatory Learning and Action (PLA) tool no. 17 (https://www.aidsalliance.org/).

acceptable? During what period of the year are health services unavailable? (Cf. Seasonal calendar) What health services are not available at all despite the community need?

4. What do you think of the availability/credibility of health personnel? How satisfied are you with their service? (PROBE: knowledge, approach, communication, trust) During what period of the year are health personnel unavailable? (Cf. Seasonal calendar)

5. What type of medication is easily/not readily available? During which period of the year is it more difficult to access these drugs (Cf. Seasonal calendar) Why? What are you doing to alleviate this problem?

6. What motivates you to seek treatment at the health centre? What discourages you from doing this? (PROBE: quality of care, absence of staff, lack of medication, decision-making power, workload, distance from the health centre, costs, etc.) During which period of the year are you least motivated seek care in health establishments (Cf. Seasonal calendar) Why? What are you doing to alleviate this problem?

7. What do you think of the sensitization sessions organized by health workers or community development workers from different NGOs? What do you think of the different topics they are talking about? Did you find them useful/relevant/easily applicable? Why/why not? What behaviours have you particularly struggled with? Why? (Advantages/disadvantages)

Recommendations

8. How did you try to solve these problems individually / collectively at the community level?
9. How do you think they could be resolved? (SOLUTIONS)
10. What could we do on your side? (LOCAL CAPACITIES)
11. What do you need to get there? (NEEDS)
12. Which solution should have the highest priority? (PRIORIZATION)
13. What period of the year should the action be taken? (SEASONALITY)
14. Who should be targeted by this priority action?

INTERVIEW GUIDE: MALNUTRITION

1. What do you think of the children in these photos? (Cf. Photos of malnourished children (marasmus/kwashiorkor/stunting) What disease do they suffer from? What words do you use to describe such children in your community? Are some words more sensitive than others? Why?

2. What are the causes of these diseases? What are the reasons why a child would become like this? (Cf. Hypothesis Flashcards)

3. What do you think of this disease? How is it similar or different from other childhood illnesses? Which type is more common in your community?

4. What type of child seems to be more vulnerable to this disease? (PROBE: sex/age/household composition/birth size/birth spacing/head of household/mother's characteristics (age, education, workload, well-being)/economic means/breastfeeding/feeding practices/hygiene, etc.

5. In which season/month do you see more children being like this? (Cf. Seasonal calendar) Since when do children in your community suffer from this disease? (Cf. Historical calendar) Have you observed an increase/decrease in cases in certain years? How will you explain these variations?

6. Do you think your child could become like this? Why/why not? (PROBE: What behaviours/practices can induce/prevent this condition?)

7. Do you think you could become like this? Why/why not?

8. How do you treat this disease in your community? (Cf. Therapeutic route) (PROBE: What is the most common treatment?)

9. Narration: XX has a daughter born 5 months ago. She had been breastfeeding him since birth, supplementing with herbal teas and concoctions to wash out her intestines. After the rest period, she began to feed him with the food, which she prepared for the rest of the family. Being in the field most of the day, XX left her daughter with her grandmother who was supposed to watch her. Her daughter started to lose weight and she was no longer smiling. XX decided to take her to a traditional healer to treat her with medicinal herbs. However, her daughter is not getting better.

What do you think of this story? XX made the right decisions? Why / why not? What would you do differently? What would you suggest to XX next?

Recommendations

10. How did you try to solve these problems individually/collectively at the community level?
11. How do you think they could be resolved? (SOLUTIONS)
12. What could be done on your side? (LOCAL CAPACITIES)
13. What do you need to get there? (NEEDS)
14. Which solution should have the highest priority? (PRIORIZATION)
15. What period of the year should the action be taken? (SEASONALITY)
16. Who should be targeted by this priority action?

INTERVIEW GUIDE: NUTRITION

1. What do you think of the meals of two children in the photo? (Cf. Images of balanced/unbalanced meals) + (Cf. Images of food portions)
2. How do you describe a nutritious meal (without limiting financial resources)? (PROBE: quantity/composition/cooking preparation/taste)? Why do you think this meal is good for you? How often do you eat this type of meal? What prevents you from eating it more often? (PROBE: availability/accessibility/acceptability/ease of preparation) (Cf. Composition of meals)
3. What do you think of the following foods: sweet potatoes, cassava, rice, cowpeas, peanuts, green leaves, eggs, milk, dried fish, meat? (PROBE: availability/accessibility/acceptability/taste/nutritional contribution/energy contribution/ease of preparation/frequency of consumption/right to eat as a priority) Which of these foods is prohibited for members of this community? How does availability/accessibility change throughout the year? (Cf. Seasonal calendar) How has availability/accessibility changed over the past 10-15 years? (Cf. Historical calendar)
4. How would you describe a favourite meal (much appreciated but not necessarily nutritious)? Why do you like him? How often do you eat this type of meal? What prevents you from eating it more often? (PROBE: availability/accessibility/cultural habits)
5. How do you describe your usual meals (eaten frequently)? What do you think of these types of meals? (PROBE: quantity/composition/type of cooking/taste/capacity to satiate) How often do you eat this type of meal? Who in the household decides what type of meal is cooked? How do you divide the meal available among all members of your household? Does the family eat together or in a specific order?
6. Have there been any changes in your eating habits over the past 10-15 years? (Cf. Historical calendar) Are there changes in your eating habits throughout the year? (Cf. Seasonal calendar) (Cf. Composition of meals lean period vs. post-harvest period)
7. How do the eating habits of children and/or pregnant and breastfeeding women differ from the eating habits of other household members? What foods cannot be eaten by children/pregnant and breastfeeding women? Why? How does the diet of girls/boys differ?
8. Where do you usually get your food? (PROBE: agricultural production, purchase, food aid, barter/trade, gathering/hunting) How does it vary throughout the year? (Cf. Seasonal calendar) How has this changed over the past 10-15 years? (Cf. Historical calendar)
9. Narration: XX is 18 years old. She got married about three years ago. She is now pregnant with her second child. She noticed that she felt very weak and sometimes sick all day. She went to the health centre and the staff encouraged her to eat more to help the baby grow. Yet her mother-in-law has discouraged her saying that her baby will grow too big and she will suffer complications during childbirth. What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why/why not? What would you do differently?
10. Narration: XX has a husband and 5 children. Her husband's parents live with them. One day the husband gave her 5000 SoSh to prepare an evening meal. XX bought some rice but it will not be enough for the whole family. At dinner time, she reserved a plate for her husband and parents. She gave the rest of the meal to her eldest children, two boys. XX and his three little daughters go

to bed hungry. What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why/why not? What would you do differently?

Recommendations

11. How did you try to solve these problems individually/collectively at the community level?
12. How do you think they could be resolved? (SOLUTIONS)
13. What could be done on your side? (LOCAL CAPACITIES)
14. What do you need to get there? (NEEDS)
15. Which solution should have the highest priority? (PRIORIZATION)
16. What period of the year should the action be taken? (SEASONALITY)
17. Who should be targeted by this priority action?

INTERVIEW GUIDE: CARE PRACTICES

1. What is your daily routine like with a baby under 3 months/6 months/over 6 months? How does your daily routine change with the child's age? (PROBE: breastfeeding/complementary feeding/interactions with the child/babysitting/hygiene) How does your routine change during the week? How does your routine change over the year? (Cf. Seasonal calendar) How did your routine change between the first and the successive children you had? What changes in child care practices have you observed between you and your parents/grandparents? (Cf. Historical Calendar) What would you like to do differently than today? Why? What is stopping you from doing it?
2. What local beliefs influence childcare practices in your community? What beliefs prevent the appropriation of "new" practices promoted by health workers?
3. What challenges do you face when looking after your children? (PROBE: lack of knowledge/resources/time/other)
4. Who helps you take care of your children? What do they help you with? How often? How are fathers involved in childcare activities? What do you think of their involvement?
5. Who advises you on how to take care of your children? Are you under any obligation to follow these tips? What kind of child care decisions can you make on your own?
6. Narration: XX is 30 years old. She has four children. The last one was born three months ago. She breastfeeds her when she is home in the morning and evening. In the meantime, she has many activities in the village (fetching water, collecting firewood, going to the market, working in the fields) and she does not bring her baby with her. She leaves the baby with her 10-year-old daughter. She teaches her how to take care of a baby and prepares the meal before leaving very early in the morning. The meal being different from family meals, the eldest daughter is tempted to eat it. She only gives her little sister a few spoons. What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why / why not? What would you do differently?
7. When do you introduce complementary foods to your baby? What do your baby's meals consist of? How often do you feed him/her? (Cf. Composition of meals) What would you like to do differently than today? Why? What is stopping you from doing it? How do children's eating habits change throughout the year? (Cf. Seasonal calendar)
8. Narration: XX has a little boy. He is very active. He likes to play. He likes to run. Sometimes he's really disobedient. While XX's husband migrates to find pastures to feed their cattle, XX remains alone with her little boy. She is now pregnant with her second child. This morning the little boy woke up very energetic. He sings and jumps. XX has just returned from the water point and has put a container next to the door. As the little boy ran around, he knocked over the can and water flooded the yard. XX was really angry and slapped him for being mean. What do you think of this story? What do you think of XX's situation? Do women in your community face the same difficulties? Why / why not? What would you do differently?

Recommendations

9. How did you try to solve these problems individually/collectively at the community level?
10. How do you think they could be resolved? (SOLUTIONS)

11. What could be done on your side? (LOCAL CAPACITIES)
12. What do you need to get there? (NEEDS)
13. Which solution should have the highest priority? (PRIORIZATION)
14. What period of the year should the action be taken? (SEASONALITY)
15. Who should be targeted by this priority action?

INTERVIEW GUIDE: MARRIAGE, PREGNANCY AND CHILD SPACING

1. Narration: XX is 13 years old. She has 7 other siblings; she is the oldest. Her parents prepared a separate bedroom for her so that he could receive visitors during the day as well as at night. They have financial difficulties and the dowry could provide relief. Often, they do not have enough to eat so XX invites the boys from the village to his house to receive a daily meal or other gifts in exchange for sex. Her best friends have advised her to do this, showing her new clothes and shoes every week. Meanwhile, the parents negotiate the dowry of 30 cattle with their 45-year-old cousin who wants to take a third wife. XX is not educated in intimate relationships and very soon becomes pregnant with a 15-year-old boy. The cousin refuses to marry her and the parents disengage, having lost hope for economic advancement. The father of the child being too young and destitute does not intend to marry. The pregnant girl finds herself abandoned and must find ways to meet her daily needs. What do you think of this story? Is this happening in your community? How does the community perceive extramarital sex (before marriage / during marriage? What would you do if you were XX? What would you do if you were XX's parents?
2. At what age do young men/women marry in your community? What changes have you observed in marriage practices over the past 10-15 years? (Cf. Historical Calendar) What inspired these changes? When do you think young men/women are ready to get married/be parents (physically and emotionally?)
3. How did you describe life as a couple in your community? How can you describe an exemplary marriage? How do you deal with disagreements during marriage? What are the usual causes of these disagreements?
4. How many children do members of your community usually have? Why?
5. What is the usual birth spacing in your community? Why?
6. Narration: XX is 28 years old. She married her husband 12 years ago. Since then, she has given birth to a child almost every year. Out of 10 children, 3 died rather young. XX's husband wants to replace them so that they have enough people to work in the fields. XX does not want any more children, she has had enough of successive pregnancies. She is afraid to tell her husband that she doesn't want any more children because he says they are a gift from God. What do you think of this story? Can this happen in your community? Why do you think this is happening? What do people think about birth spacing? Is a woman involved in a decision about births? Why / why not? What would you do if you were XX?
7. Who advises women, especially adolescent girls, during pregnancy?

Recommendations

8. How did you try to solve these problems individually/collectively at the community level?
9. How do you think they could be resolved? (SOLUTIONS)
10. What could be done on your side? (LOCAL CAPACITIES)
11. What do you need to get there? (NEEDS)
12. Which solution should have the highest priority? (PRIORIZATION)
13. What period of the year should the action be taken? (SEASONALITY)
14. Who should be targeted by this priority action?

INTERVIEW GUIDE: WOMEN AUTONOMY AND WORKLOAD

1. What does your daily routine look like? (Cf. Daily Activities) How does your routine change during the year? (Cf. Seasonal calendar) What changes in daily routine have you observed between you and your parents/grandparents? (Cf. Historical Calendar) What would you like to do differently than today? Why? What is stopping you from doing it?

2. How does your daily routine differ from that of men?
3. How do you see your workload? When is your workload heavier/do you feel busier or tired? (Cf. Seasonal calendar) What do you do when you feel like this?
4. What differences in daily routines have you observed between different households? What characterizes households with less workload?
5. What community groups are you a part of? What are the advantages and/or disadvantages of participating in these groups? How often do you attend community gatherings?
6. How often do you go out of your house/village? Who decides if you can leave? Where can you go without asking for anyone?
7. What activities can you make decisions about without consulting anyone? For which activities do you need to consult another member of your household? What activities can only a member of your household make decisions about? (PROBE: schooling, marriage, household expenses, composition of meals, daily activities, workload, rest after childbirth, medical treatment in case of illness, family planning). What do you think of this division of decision making? What would you like to change about this division of decision-making? In what areas would you like decisions to be made differently?
8. For decisions, where you need to consult another member of your household, to what extent can you participate in the decision-making? For decisions, when a member of your household is making decisions, to what extent can you contribute to the decision-making? How much do you feel listened to when decisions are made? What can you do when you disagree with a decision you have made? What happens when your opinion has not been taken into account, but it turns out that it would have been a good decision? How does this change decision making within the household?
9. Does your decision-making power change when your husbands migrate? Who makes the decisions in their absence?
10. How well can you access information to make informed decisions? What barriers to access do you encounter in accessing information?
11. What rights do women in this community have with regard to owning/inheriting land? Who usually decides what to plant?
12. What activities can women in this community do to generate income? Who controls the income generated in this way? What other activities do you think women in this community should be allowed to do to generate income? What changes in autonomy/decision-making power have you observed between you and your parents/grandparents? (Cf. Historical calendar)
13. What can you sell in the market without consulting another member of your household? What can you buy in the market without consulting another member of your household? What changes do you think might help you with regards to selling/buying in the market? Why?
14. What rights do women in this community have in lending or borrowing money? Who decides how the borrowed money is spent? Who is responsible for reimbursing the money? What advantages/disadvantages does this arrangement bring you? How do you think this arrangement should change?
15. How would you describe your relationships with other members of your household? Which relationships bring you the most joy? Which relationships are you most concerned about? Why? How comfortable are you telling members of your household that you disagree/disagree?

Recommendations
16. How did you try to solve these problems individually/collectively at the community level?
17. How do you think they could be resolved? (SOLUTIONS)
18. What could be done on your side? (LOCAL CAPACITIES)
19. What do you need to get there? (NEEDS)
20. Which solution should have the highest priority? (PRIORIZATION)
21. What period of the year should the action be taken? (SEASONALITY)
22. Who should be targeted by this priority action?

1. What did you hope to achieve in your life? What inspired your dreams when you were younger? What did your parents/loved ones think about your dreams? Were you (completely/partially) able to achieve your dreams? Why? How do you feel about that? How does this influence your support for your children?
2. How did you describe the way your parents interacted with you and the way you interact with your children? What has changed in the meantime?
3. Were you used to discussing various topics with your parents? Do you usually do this with your children? What topics are often avoided?
4. If necessary, who do you seek advice/help from? Who has the greatest influence on your decisions? Who do you children seek advice/help from? What do you think of this choice?
5. Are there any disagreements between young people, their parents and/or their grandparents? What values do/do you not share with the younger generations? What do you blame your children for the most?
6. What do you think are the most common problems between women and men? Why do they exist? (PROBE: sources of income and their use/quality of meals/workload/intimate relationships/infidelity/number of children/decision-making power) What do you never tolerate in your relationships? (PROBE: physical/psychological/sexual violence) Do these behaviours exist in your community?
7. What work/development possibilities do you have in your community? What do you think of these possibilities? What is missing? How do these possibilities influence the way you live in your families/community? What activities do you usually attend with other members of the community? What community groups are you a part of? What are the advantages and/or disadvantages of participating in these groups? Which institutions are the most valuable to you in your life? (PROBE: family/diaspora/school/church/state/international aid). How has their role changed over time?
8. How does the feeling of security / insecurity influence your way of living in the community?

Recommendations

9. How did you try to solve these problems individually/collectively at the community level?
10. How do you think they could be resolved? (SOLUTIONS)
11. What could be done on your side? (LOCAL CAPACITIES)
12. What do you need to get there? (NEEDS)
13. Which solution should have the highest priority? (PRIORIZATION)
14. What period of the year should the action be taken? (SEASONALITY)
15. Who should be targeted by this priority action?

1. What do you hope to achieve in your life? What inspired your dreams? What do your parents/loved ones think about your dreams? Will the current conditions allow you to achieve your dreams?
2. How did you describe the way your parents interact with you and the way they interact with their parents? What differences have you observed? Do you think you will run your own household the same way your parents did? Why/Why not? What are you going to do differently?
3. Are you used to discussing various topics with your parents? What topics are often avoided?
4. If necessary, who do you seek advice/help from? Who has the greatest influence on your decisions? What do your parents think about this choice?
5. Are there any disagreements between young people, their parents and/or their grandparents? What values do you/don't you share with them? What do they blame you most often?
6. What work/development possibilities do you have in your community? What do you think of these possibilities? What is missing? How do these possibilities influence the way you live in your families/community? What activities do you usually attend with other members of the community? What community groups are you a part of? What are the advantages and/or

disadvantages of participating in these groups? Which institutions are the most valuable to you in your life? (PROBE: family/diaspora/school/church/state/international aid).

7. What do you think are the most common problems between women and men? Why do they exist? (PROBE: sources of income and their use/quality of meals/workload/intimate relationships/infidelity/number of children/decision-making power) What do you never tolerate in your relationships? (PROBE: physical/psychological/sexual violence) Do these behaviours exist in your community? Do you think you will have the same type of problems in your relationships?

8. How does the feeling of security / insecurity influence your way of living in the community?

Recommendations

9. How did you try to solve these problems individually/collectively at the community level?

10. How do you think they could be resolved? (SOLUTIONS)

11. What could be done on your side? (LOCAL CAPACITIES)

12. What do you need to get there? (NEEDS)

13. Which solution should have the highest priority? (PRIORIZATION)

14. What period of the year should the action be taken? (SEASONALITY)

15. Who should be targeted by this priority action?

INTERVIEW GUIDE: SOURCES OF INCOME & RESILIENCE STRATEGIES

1. What are the main sources of income in your community? Do they vary throughout the year? (Cf. Seasonal calendar) Have they changed over the past 10-15 years? (Cf. Historical calendar) What caused the change?

2. What activities can women in this community do to generate income? Who controls the income generated in this way? What other activities do you think women in this community should be allowed to do to generate income?

3. What challenges do you face in agriculture? (PROBE: access to water/land/soil degradation/ unavailability of seeds/tools/know-how/labour/cost of labour/plant diseases/access to the market for sale/price fluctuations during sowing or harvesting/fluctuations in market demand/quality requirements) Do these challenges vary throughout the year? (Cf. Seasonal calendar) Have these challenges changed over the past 10-15 years? (Cf. Historical calendar) What caused the change?

4. What challenges do you encounter in the field of breeding? (PROBE: access to water/grazing/vaccination/animal diseases/unavailability of know-how/access to markets for sale/fluctuating prices/fluctuating market demand/quality requirements) These challenges vary during the year? (Cf. Seasonal calendar) Have they changed over the past 10-15 years? (Cf. Historical calendar) What caused the change?

5. What consequences do these challenges have on your household income? What coping strategies do you deploy to compensate for any losses? (Cf. Coping strategies).

6. Which households in your community are more vulnerable to food insecurity?

7. Do members of your community tend to migrate? If so, who is migrating? Or? When? For how long? Why? (Cf. Seasonal Calendar) Have migration trends in your community changed over the past 10-15 years? (Cf. Historical calendar) What are the consequences of migration or the evolution of migratory flows on the members of a household who remain? (PROBE: income, workload, decision-making, nutrition, health, child care practices).

Recommendations

8. How did you try to solve these problems individually/collectively at the community level?

9. How do you think they could be resolved? (SOLUTIONS)

10. What could be done on your side? (LOCAL CAPACITIES)

11. What do you need to get there? (NEEDS)

12. Which solution should have the highest priority? (PRIORIZATION)

13. What period of the year should the action be taken? (SEASONALITY)

14. Who should be targeted by this priority action?

INTERVIEW GUIDE: MARKET ACCESS AND USE OF RESOURCES

1. How would you describe your market access? What access barriers do you face (PROBE: distance, lack of transport, transport costs, insecurity) How does your access to the market change during the seasons? (Cf. Seasonal calendar) How has it changed over the past 10-15 years? (Cf. Historical calendar).
2. What types of products are available in the market? During what period of the year are the products less available and/or unavailable? (Cf. Seasonal calendar) What products are not available at all despite the community need? What are you doing to alleviate this problem? Has product availability changed over the past 10-15 years? (Cf. Historical calendar)
3. How do product prices fluctuate over the year? (Cf. Seasonal calendar) How have they changed over the past 10-15 years? (Cf. Historical calendar)
4. What other services do you access the market for?
5. How do you use your household income? (Cf. Household expenses) What differences have you noticed in the spending practices between men and women?
6. How/How much/For what purpose do members of your community tend to save resources?
7. How do members of your community access credit? From whom/under what conditions? How much debt do the members of your community tend to accumulate?
8. What kind of expenses can women make decisions about without consulting anyone? What type of expenses do they need to consult you for? What kind of expenses are you alone in making decisions about? (PROBE: schooling, marriage, household expenses, composition of meals, daily activities, workload, rest after childbirth, medical treatment in case of illness, family planning). What do you think of this division of decision making? What should change about this division? Does the decision-making process change in the absence of the husband, e.g. migration)?
9. For decisions, where should women consult you, to what extent do you let them be involved in decision-making? For decisions that you mostly make on your own, to what extent do you allow women to express their opinion? To what extent do you listen to women in decision-making? What happens when your wife's opinion has not been taken into account, but it turns out that it would have been a good decision? How does this change decision making within the household?
10. What can women sell in the market without consulting you? What can they buy in the market without consulting you?
11. Do women receive a weekly allowance? If so, how much and for what?
12. What rights do women in this community have with regard to owning/inheriting land? What rights do women in this community have when it comes to lending or borrowing money? Who decides how the borrowed money is spent? Who is responsible for reimbursing the money? What advantages/disadvantages does this arrangement bring you?

Recommendations

13. How did you try to solve these problems individually/collectively at the community level?
14. How do you think they could be resolved? (SOLUTIONS)
15. What could be done on your side? (LOCAL CAPACITIES)
16. What do you need to get there? (NEEDS)
17. Which solution should have the highest priority? (PRIORIZATION)
18. What period of the year should the action be taken? (SEASONALITY)
19. Who should be targeted by this priority action?

INTERVIEW GUIDE: WATER, SANITATION AND HYGIENE

1. How would you describe the importance of water in the life of your community? How does this perception influence the use of water? How has your approach to water changed over the past 10-15 years? (Cf. Historical calendar) Why?
2. How would you describe the cleanliness/dirtiness? How does this perception influence sanitation/hygiene in your community? How has your approach to sanitation changed over the past 10-15 years? (Cf. Historical calendar) Why?

3. How would you describe your access to water? What access barriers do you face (PROBE: distance/availability/quality/price/workload/shortage/transport costs/waiting time) How your access to water changes over the seasons? (Cf. Seasonal calendar) How has it changed over the past 10-15 years? (Cf. Historical calendar)
4. How do people in your community treat/store water? What challenges do they face in this regard?
5. Who is responsible for collecting water for the household? How much water do you collect in a day? Does it change throughout the year? (Cf. Seasonal calendar) Has this changed over the past 10-15 years? (Cf. Historical calendar) Why? What are the consequences of these changes?
6. What use of water is prioritized? (PROBE: drinking/cooking/bathing/laundry/animal consumption/agriculture)
7. How would you describe your access to sanitation facilities? What barriers to access do you face (PROBE: availability, durability, acceptability, price, workload) Has this changed over the past 10-15 years? (Cf. Historical calendar)

Recommendations

8. How did you try to solve these problems individually/collectively at the community level?
9. How do you think they could be resolved? (SOLUTIONS)
10. What could be done on your side? (LOCAL CAPACITIES)
11. What do you need to get there? (NEEDS)
12. Which solution should have the highest priority? (PRIORIZATION)
13. What period of the year should the action be taken? (SEASONALITY)
14. Who should be targeted by this priority action?

INTERVIEW GUIDE: HEALTH AND NUTRITION (HEALTH STAFF)
1. What types of services do you offer? What fees do you charge? (PROBE: antenatal/postnatal care, childbirth, vaccination)
2. What do you think of your working conditions? (PROBE: supervision, workload, availability of equipment, medication, location, salary)
3. What is your daily routine? How does it change throughout the week/month? How does it change throughout the year?
4. How does the community perceive the services in this health facility? What services do they tend to use most often? Are there any services they don't use at all? Why?
5. What barriers prevent the community from using the services of this health facility? Does this change throughout the year? (Cf. Seasonal calendar) Has this changed over the past 10-15 years? (Cf. Historical calendar)
6. What are the most common childhood illnesses in this community? (PROBE: diarrhoea, fever, acute respiratory infections, malaria) What are their main causes? During which months are they the most frequent? (Cf. Seasonal calendar) Has the prevalence of these diseases changed over the past 10-15 years? (Cf. Historical Calendar) What is the preferred treatment option in this community for these childhood illnesses?
7. What is the perception of undernutrition in the community? What are its main causes in this community? (Cf. Hypothesis Flashcards) Does the community understand its causes differently? If yes, how? Why?
8. Is malnutrition stigmatized in this community? If yes, how?
9. What type of child seems to be more vulnerable to this disease? (PROBE: sex/age/household composition/birth size/birth spacing/head of household/mother's characteristics (age, education, workload, well-being)/economic means/breastfeeding/feeding practices/hygiene, etc.
10. Are there children in these categories who are not malnourished? If yes, why? What are their parents doing differently?
11. What are the main challenges parents face in keeping their children healthy?

INTERVIEW GUIDE: HEALTH & NUTRITION (COMMUNITY LEADERS)
1. What are the main challenges facing members of this community?

2. What consequences do these challenges have on their health? Why?
3. What do you think of the children in these photos? (Cf. Photos of malnourished children (marasmus / kwashiorkor/stunting)
4. What disease do they suffer from? What words do you use to describe such children in your community? Are some words more sensitive than others?
5. What are the causes of this disease? What are the reasons why a child would become like this? (Cf. Hypothesis Flashcards)
6. What do you think of this disease? How is it similar or different from other childhood illnesses? Which type is more common in your community?
7. What type of child seems to be more vulnerable to this disease? (PROBE: sex/age/household composition/birth size/birth spacing/head of household/mother's characteristics (age, education, workload, well-being)/economic means/breastfeeding/feeding practices/hygiene, etc.
8. How do you treat this disease in your community? (Cf. Therapeutic route) (PROBE: What is the most common treatment?)
9. What are the main challenges parents face in keeping their children healthy? What local beliefs do you think are related to these challenges? Do they need to be strictly followed? Have they been followed in the same way over the past 10-15 years? If not, what has changed? (Cf. Historical calendar).

INTERVIEW GUIDE: BARRIER ANALYSIS (DO-ERS)

Prioritised behaviours

a) Prenatal consultations;
b) Use of family planning;
c) Delivery at the health facility/Postnatal care;
d) Exclusive breastfeeding (0-6 months);
e) Infant and young child feeding (6-23 months);
f) Personal hygiene of the child;
g) Hygiene of the child's play area.

1. What illnesses can you / your child suffer from if you DO NOT PRACTICE THE BEHAVIOR?
2. What do you think of [ILLNESS mentioned by mother]? Is it dangerous?
3. When a person practices (THE BEHAVIOR), does this lead to the desired effect? (Ex. "When a person exclusively breastfeeds a child for the first six months of life, does this help prevent [the ILLNESS mentioned by the mother]?")
4. To what extent does (THE BEHAVIOR) help prevent (ILLNESS)?
5. Who (individuals or groups) do you think, object or disapprove if you practice (THE BEHAVIOR)?
6. Who (individual or group) do you think approves if you practice (THE BEHAVIOR)?
7. Which of these individuals or groups in the two questions above are most important to you?
8. How easy is it for you to practice (THE BEHAVIOR)?
9. How easy is it to remember to practice (THE BEHAVIOR) every time you need to do it?
10. Is it sometimes God's will that people / children get (ILLNESS)?
11. Why do some people get (ILLNESS) and others not?
12. Do people ever get (ILLNESS) from curses or other spiritual or supernatural causes?
13. What do you think are the benefits or good things that happen if you practice (THE BEHAVIOR)? What things do you like about practicing (BEHAVIOR)?
14. What do you think are the downsides or bad things that happen if you practice (THE BEHAVIOR)? What are the things that you dislike about practicing (BEHAVIOR)?

INTERVIEW GUIDE: BARRIER ANALYSIS (NON-DOERS)

Prioritised behaviours

a) Prenatal consultations;
b) Use of family planning;
c) Delivery at the health facility/Postnatal care;
d) Exclusive breastfeeding (0-6 months);
e) Infant and young child feeding (6-23 months);
f) Personal hygiene of the child;
g) Hygiene of the child's play area.

1. What illnesses can you / your child suffer from if you PRACTICE THE BEHAVIOR?
2. What do you think of [ILLNESS mentioned by mother]? Is it dangerous?
3. When a person does not practice (THE BEHAVIOR), does this lead to the desired effect? (Ex. "When a person does not exclusively breastfeed a child for the first six months of life, does that help prevent [the ILLNESS mentioned by the mother]?")
4. To what extent does (BEHAVIORAL NON-PRACTICE) help prevent (ILLNESS)?
5. Who (individuals or groups) do you think objects or disapproves of if you practice (THE BEHAVIOR)?
6. Who (individual or group) do you think approves if you don't practice (THE BEHAVIOR)?
7. Which of these individuals or groups in the two questions above are most important to you?
8. Would it be easy for you to practice (THE BEHAVIOR)?
9. What makes it difficult, if not impossible, to practice (THE BEHAVIOR)?
10. What could make (THE BEHAVIOR) easier to practice?
11. How easy would it be to remember to practice (THE BEHAVIOR) every time you had to?
12. Is it sometimes God's will that people / children get (ILLNESS)?
13. Why do some people get (ILLNESS) and others not?
14. Do people ever get (ILLNESS) from curses or other spiritual or supernatural causes?
15. What do you think are the benefits or good things that will happen if you practice (THE BEHAVIOR)? What are the things that will plead you practicing (THE BEHAVIOR)?
16. What do you think are the downsides or bad things that will happen if you practice (THE BEHAVIOR)? What are the things that you would not like about practicing (THE BEHAVIOR)?

SUMMARY OF CONCLUSIONS, CATEGORIZATION OF RISK FACTORS AND FINAL RECOMMENDATIONS

The purpose of this exercise is to involve community members in categorizing risk factors based on their impact on the occurrence of undernutrition in their community. In other words, community members will be encouraged to prioritize identified risk factors, from most problematic to least problematic, based on their perceived link to undernutrition. In addition, they will be encouraged to identify risk factors, which they think are likely to change first, if properly managed.

Prior to the ranking exercise, the qualitative team will summarize their findings, which they have been able to compile during the first four days in the community, using pre-prepared flashcards. After presenting all of the identified risk factors, community members will be asked to validate the team's findings and interpretation of the community's main challenges related to undernutrition. If certain elements are deemed unrepresentative of the community, the study team will modify the interpretation, if necessary.

Next, participants will be asked to rank the identified risk factors, from the most problematic to the least problematic, according to their perceived link with undernutrition. Using pebbles, they will be asked to give three pebbles to factors that have a major impact on undernutrition, two pebbles to factors that have an important impact on undernutrition, and one pebble to factors that have a minor impact on undernutrition. Photos of malnourished children, which were previously used in focus group discussions, will visually help them focus more on this health issue than on the other major issues they face in their community.

All exchanges between participants in relation to this categorization exercise and/or their justification for categorization will be duly noted. All participants will be encouraged to contribute and any disagreements will be duly addressed. The aim of this exercise will be to classify the risk factors into three groups, which all participants will agree on.

Once this step is completed, participants will be asked to select a few risk factors, which they believe explain most cases of undernutrition in their community and create a main causal pattern.

Alternatively, if consensus on three risk categories proves difficult, the study team will give three pebbles to each participant and ask them to assign one pebble to each risk, which they consider to be the most important in relationship with undernutrition in their community. Once all the stones are counted, the risk factors will be divided into three categories. The study team will ask participants to validate them and come to a consensus on 4 or 5 factors having a major impact on undernutrition in their community.

After categorizing the risk factors, the study team will present solutions identified by the community in group discussions to address these challenges. A validation, followed by a prioritization of activities, will be sought.

APPENDIX

A set of visual aids (flashcards) are available as a separate file.