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INNOVATION LAB FOR NUTRITION

EFFECTIVENESS OF INTEGRATED AGRICULTURE, HEALTH & NUTRITION INTERVENTIONS TO IMPROVE MATERNAL AND CHILD NUTRITION & HEALTH IN RURAL UGANDA

UGANDA PANEL & BIRTH COHORT STUDIES



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Outline

- Study team
- Objectives of the Study
- Implementation
- Research design
- Data Collection & Status of Analysis
- Challenges
- Some Results



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- Local Governments
- Local Researchers

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OVERALL OBJECTIVE

- To understand the effect of Integrated Interventions (Nutrition, Agriculture and Health) on the Health and Nutrition status of Mothers (15-49 yrs) and Children under Two years of Age



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SPECIFIC OBJECTIVES

- To determine the Effect of integration of nutrition, agriculture and health interventions on the health and nutrition status of pregnant women and children under two years of age
- To determine the effect of aflatoxin exposure and environmental enteropathy on health and nutritional status of pregnant women and children under two years of age



SPECIFIC OBJECTIVES

- To assess the coverage, uptake and adherence to UCCP intervention messages and activities and assess the effect of heterogeneity on pregnant women and children under two years of age
- To determine the heterogeneity in the effect of UCCP interventions on maternal and child health and nutrition status due to variability in households



SCOPE-FOCUS ON UCCP

- Our research revolved around Uganda Community Connector Program (UCCP) interventions

UCCP interventions were funded by USAID in 2012-2015 and implemented at the community (parish) level

UCCP's goal was to reduce malnutrition among the most vulnerable populations (women and children) in rural areas

UCCP employed the integrated agriculture-nutrition approach

Choice of interventions was based on the gaps identified at the needs assessment exercise conducted prior to implementation

15 UCCP Districts

South Western
Ibanda
Kabale
Kamwenge*
Kanungu
Kasese
Kiryandongo
Kisoro*
Masindi
Northern
Agago*
Dokolo*
Kole*
Lira*
Nebbi
Oyam
Pader



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DESIGN OF THE UGANDA PANEL STUDY



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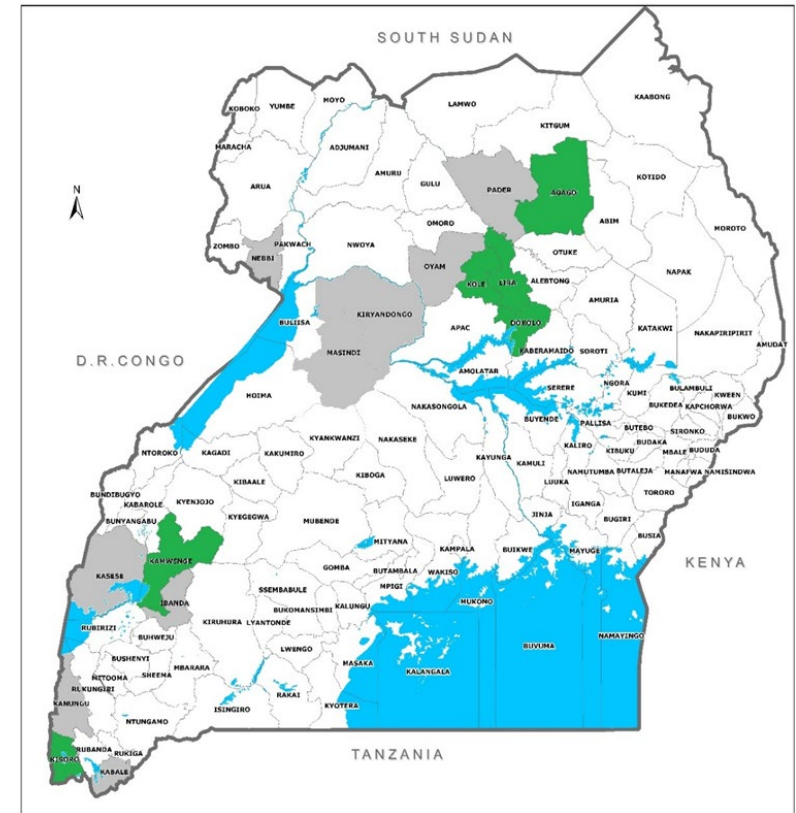
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Sample selection

- Followed a step-wise process:
- 6 (out of 15) beneficiary districts were randomly selected by region with equal probability
 - These were: Agago, **Kole**, Dokolo and Lira (N.Uganda)
 - **Kamwenge** and Kisoro (SW Uganda)
- Within each study district, parishes were randomly selected from UCCP and non-UCCP sub-counties

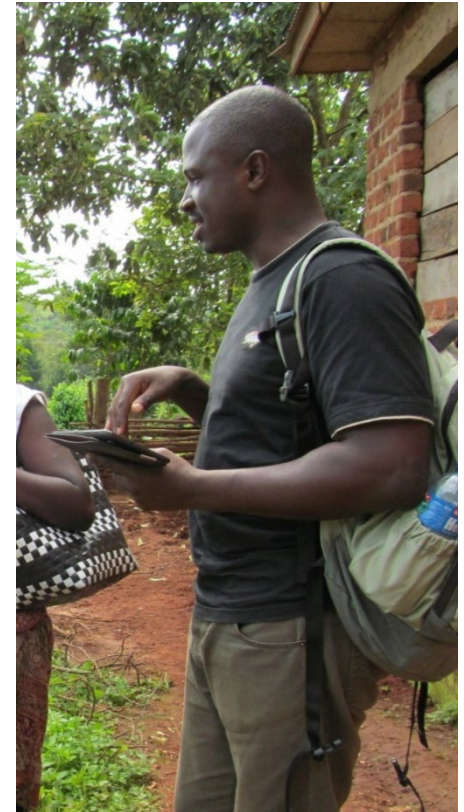




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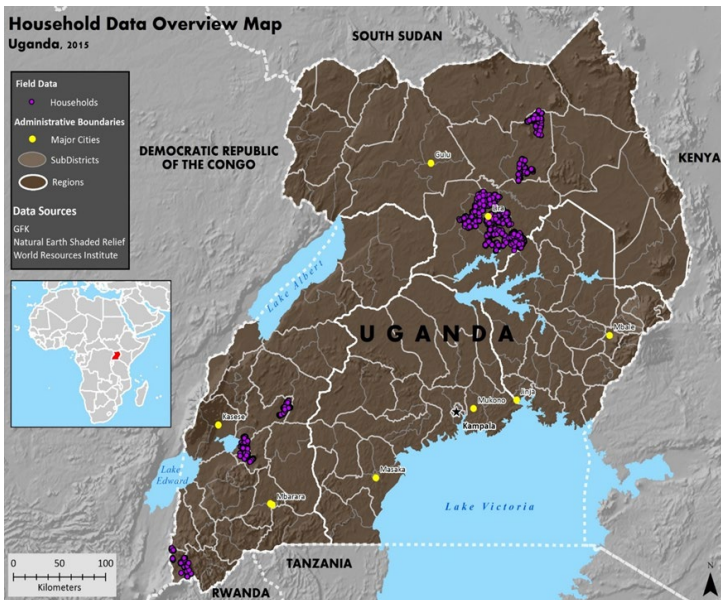
Data Collection

- Questionnaire was developed by a multidisciplinary team, pretested in the field, and translated into local languages
- Good data quality was ensured by
 - Recruiting good field staff and training them
 - Use of electronic data collection systems/devices
- Final data check (consistency of values) and development of code books were conducted



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Data Collection



We collected blood samples to test for Malaria and Hemoglobin and conducted anthropometry (body measurements) on a large sample of children (0-5 years)

- Panel dataset from 6 districts in Uganda
 - 2 SW (Kisoro & Kamwenge)
 - Northern (Agago, Kole, Dokolo and Lira)
- ~3,200 households in each survey round in 2012, 2014 and 2016;
- ~over 12,000 children (0-5 years)
- Collected a range of data ranging from agriculture, nutrition, health, endowments, gender, etc.



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DESIGN OF THE UGANDA BIRTH COHORT STUDY



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RESEARCH DESIGN

- A Cohort of Mothers and young children were to be followed from pregnancy through the first **two** years of life
- Eight (**8**) randomly selected UCCP intervention sub-counties were matched with eight (**8**) non uccp sub-counties that provided the control –**total of 16**





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RESEARCH DESIGN (Contn'd)

- Each selected UCCP sub-county was individually matched with a non-UCCP sub-county with the same
 - Agro ecology
 - Predominant language/ethnicity
- The control sub –counties were located in non-UCCP districts to minimize spillover from intervention areas

Table 1: Implementation sites-16 subcounties

DISTRICT	SUB COUNTY	PREDOMINANT LANGUAGE	STATUS
Kabale	Ruhija	Runyankore/Rukiga	Intervention
Kabale	Nyamweru	Runyankore/Rukiga	Intervention
Kanungu	Rugyeyo	Runyankore/Rukiga	Intervention
Kamwenge	Bwizi	Runyankore/Rukiga	Intervention
Nebbi	Parombo	Alur	Intervention
Lira	Agweng	Langi	Intervention
Kole	Ayer	Langi	Intervention
Pader	Atanga	Acholi	Intervention
Kabarole	Kibiito	Runyankore/Rukiga	Control
Rukungiri	Kebisoni	Runyankore/Rukiga	Control
Rukungiri	Bugangari	Runyankore/Rukiga	Control
Rukungiri	Buyanja	Runyankore/Rukiga	Control
Zombo	Atyak	Alur	Control
Lamwo	Agoro	Acholi	Control
Apac	Aduku	Langi	Control
Apac	Apac	Langi	Control



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Sampling and Sample Size

- The study was conducted in 16 sub counties
- Village health teams/guides were recruited and worked closely with the team to identify pregnant women



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- Approximately 322 pregnant women were to be selected in each of the 16 sub-counties
- The target was to enroll 5152 pregnant women (322x16) and children
 - In total 5,044(98%) women were enrolled in the study
 - Were to be followed up (**9 visits**) over a three year period





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Eligibility criteria

Sample of respondents consisted of:

- Pregnant women aged 15-49 years
- Women in their second and third trimester
- Must be Living in the study area until study follow-up period
- Mother provides informed consent



DATA COLLECTION TIME POINTS

Time point	Description Data Collection Intensive at V1 and V3
1	Prenatal 1
2	Prenatal 2
3	After birth within 72 hours
4	Infant is 3 months old
5	Infant is 6 months old (STUDY TERMINATED HERE)
6	Infant is 9 months old
7	Infant is 12 months old
8	Infant is 18 months old
9	Infant is 24 months old



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No.	Module Name	Sections	Data Collection Time Points:	Prenatal 1	Prenatal 2	Birth	3 mos	6 mos
				1	2	3	4	5
	Informed consent			x				
1	Household Information	Section 1: Interview Information		x	x	x	x	x
		Section 2: Participant and Household Head		x		x		
		Section 3: Index Child				x	x	x
		Section 4: Household Members		x		x		x
		Section 5: Household Characteristics		x		x		
2	Water, Sanitation, and Hygiene	Section 1: Water Source and Use		x			x	
		Section 2: Sanitation and Hygiene		x			x	
		Section 3: Water Quality		x				x
3	Index Woman Diet	Section 1: Index Woman Diet		x	x	x	x	x
		Section 2: Food Taboos During Pregnancy and Lactation		x		x		
4	Index Woman Health Status and Pregnancy	Section 1: Health Status		x	x	x	x	x
		Section 2: Family Planning					x	x
		Section 3: Former Pregnancies		x				
		Section 4: Current Pregnancy		x	x			
5	Pregnancy Outcome	Section 1: Pregnancy Outcome				x		
6	Index Child Health	Section 1: Vaccines				x	x	x
		Section 2: Vitamin A and Deworming					x	x
		Section 3: Child Illness and Symptoms					x	x
		Section 4: Motor Milestones and Development Outcomes					x	x
7	Index Child Breastfeeding and Complementary Feeding	Section 1: Index Child Breastfeeding and Complementary Feeding				x	x	x
		Section 2: Index Woman Nutrition Knowledge		x				x
8	Household Food Security	Section 1: Months Adequate Household Food Provisioning		x		x		
		Section 2: Household Food Insecurity Access Scale		x		x		x
9	Gender and Decision Making	Section 1: Gender and Agricultural Production		x				
		Section 2: Gender and Durable Goods		x				
		Section 3: Gender and Time Allocation		x				
10	Social Participation, Access to Information, and Program Exposure and Update	Section 1: Social Participation		x	x	x	x	x
		Section 2: Sources of Agricultural Information		x	x	x	x	x
		Section 3: Sources of Nutrition Information		x	x	x	x	x
		Section 4: Program Exposure and Uptake		x	x	x	x	x
11	Agricultural Production	Section 1: Land Ownership and Use		x		x		
		Section 2: Crop Production		x		x		
		Section 3: Inputs for Crop Production		x		x		
		Section 4: Estimation of Livestock		x		x		
		Section 5: Livestock Production		x		x		
		Section 6: Livestock Inputs		x		x		
		Section 7: Hired Farm Labor		x		x		
		Section 8: Crop and Livestock Markets		x		x		
		Section 9: Agricultural Technologies		x		x		
12	Other Income and Expenditure	Section 1: Savings and Banking		x		x		
		Section 2: Other Household Income		x		x		
		Section 3: Household Expenditures		x		x		
13	Anthropometric measurements	Section 1: Maternal and Child Vital Status		x	x	x	x	x
		Section 2: Index woman anthropometry		x	x	x	x	x



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No.	Module Name	Sections	Data Collection Time Points:	Prenatal	Prenatal	Birth	3 mos	6 mos
				1	2	3	4	5
	Informed consent			x				
		Section 3: Index child anthropometry		-	-	X	X	X
14	Laboratory Tests and Anthropometric Measurements	Section 1: Index Woman Anthropometry		x	x	x	x	x
		Section 2: Index Child Anthropometry				x	x	x
		Section 3: Index Woman Malaria Testing		x		x		x
		Section 4: Index Child Malaria Testing						x
		Section 5: Index Woman Anemia		x		X		x
		Section 6: Index Child Anemia						x
		Section 7: Index Woman Blood Draw		x		x		x
		Section 8: Index Child Blood Draw						x
15	Termination							



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Data Collected

- At Household level
 - Demographic and socio-economic information
 - Household composition, Wealth indicators, assets, income, livelihood activities , social participation, water and sanitation, sanitation, access to health services



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Data collected contn'd

-Agriculture

Activities, production and sale, labor, utilization of technologies and management practices

-Food Security

Gender roles and Dynamics

Women's role in agriculture, access, ownership and control of assets, production and income, decision –making, time use and access agricultural and nutritional information



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Data collected contn'd

Caregiver and child (0-23 months)

- Diet
 - Included infant and young child feeding practices
- Health
 - Recent morbidity, hygiene, utilization of health interventions and services



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Data collected contn'd

- Nutritional status
 - Anthropometry
- Venous blood draws
 - Iron, Malaria, Aflatoxins



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Data Analysis

Descriptive statistics have been generated at 2 levels:

- Comparing North vs SW regions and
- Comparing Intervention vs control areas for key indicators.



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Challenges

- Remoteness of some locations increased posed access challenges for the phlebotomist and research teams including transportation of blood samples to nearest cold storage centres
- Cost and availability of dry ice-we needed to pre-pay and book-monopolist
- Some partners at local Health Centres not very cooperative, necessitated frequent sample pickups



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Challenges

- Limited cold storage capacity at some health facilities in the districts
- Fatigue on the part of some enumerators
- Inadequate in country capacity for blood analysis
- High shipment costs of samples to the US
- Above culminated into unexpected high costs for the study



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Selected Descriptive Results



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TREATMENT VERSUS CONTROL

SELECTED INDICATORS



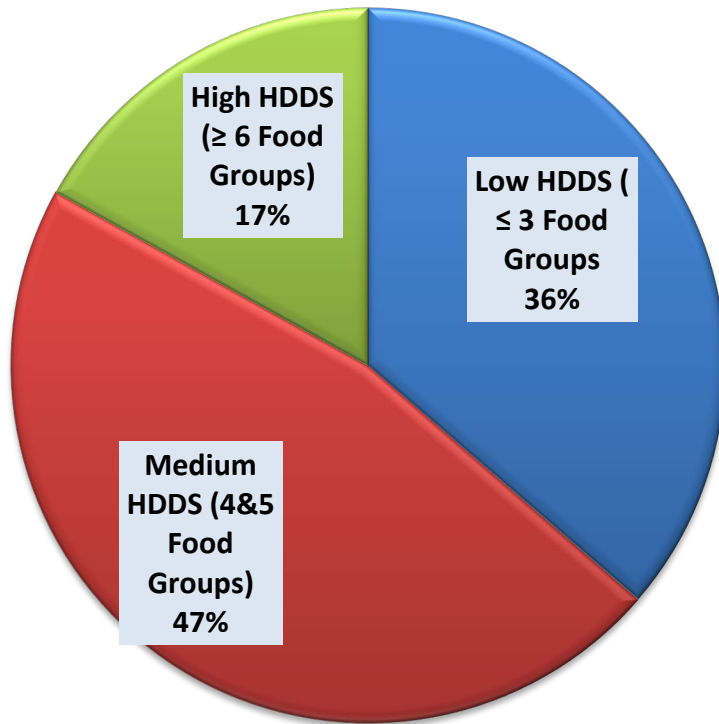
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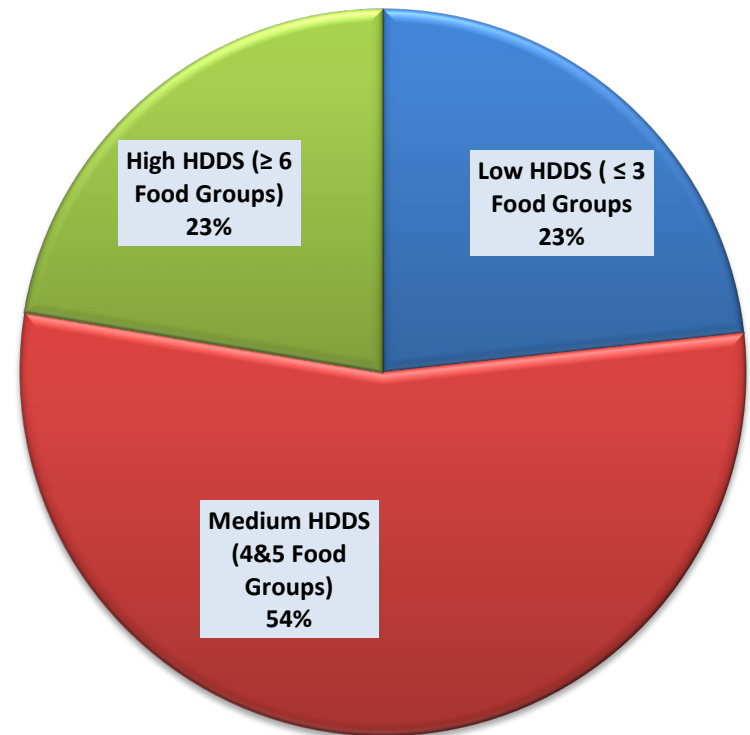
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Household Dietary Diversity Score

Intervention - Household Dietary Diversity Score

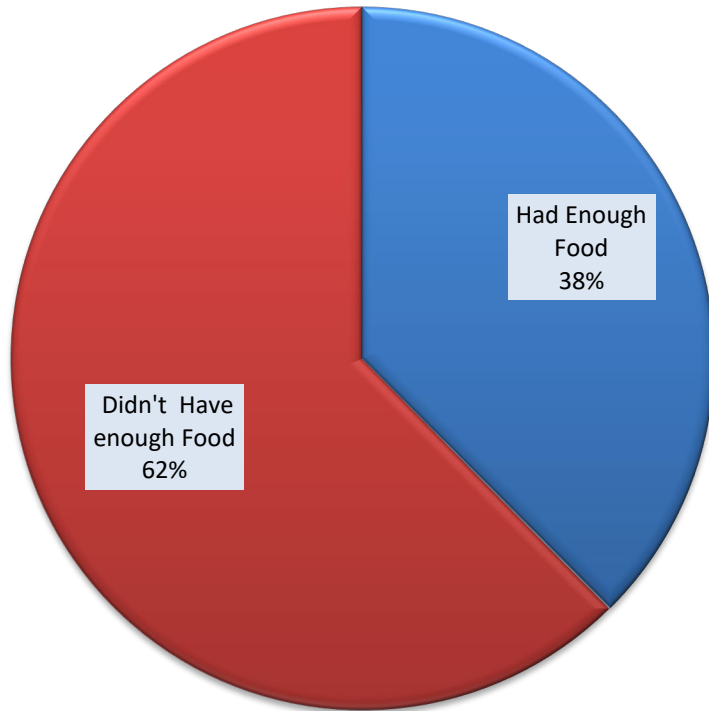


Control Group Household Dietary Diversity Score



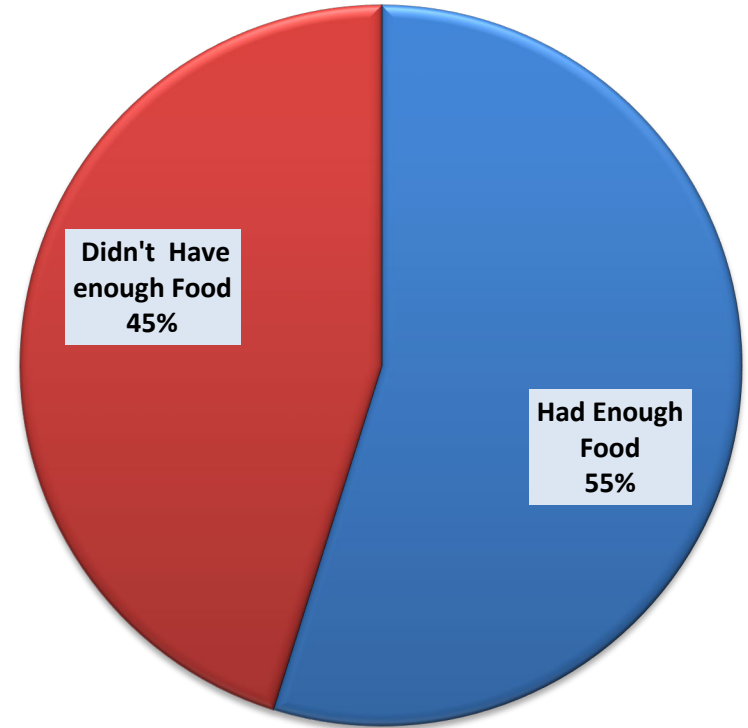
Household Food Provisioning (MAHFP)

INTERVENTION-Adequate Household Food Provisioning (MAHFP) in last 12 Months



Households in Intervention areas had 3 months of inadequate food access in the last 12 months

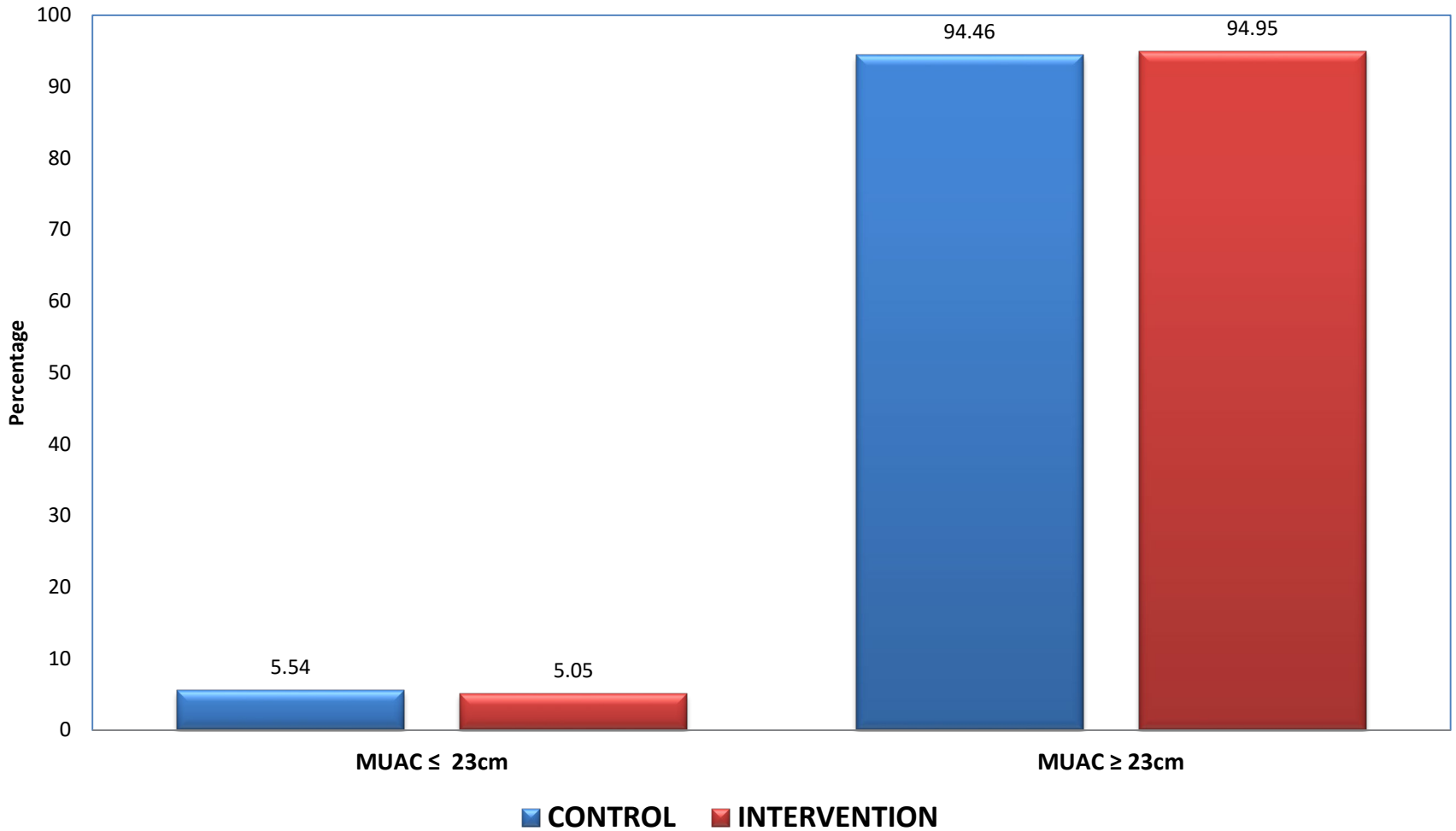
CONTROL-Adequate Household Food Provisioning (MAHFP) in last 12 Months



Households in control areas had 4 months of inadequate food access in the last 12 months

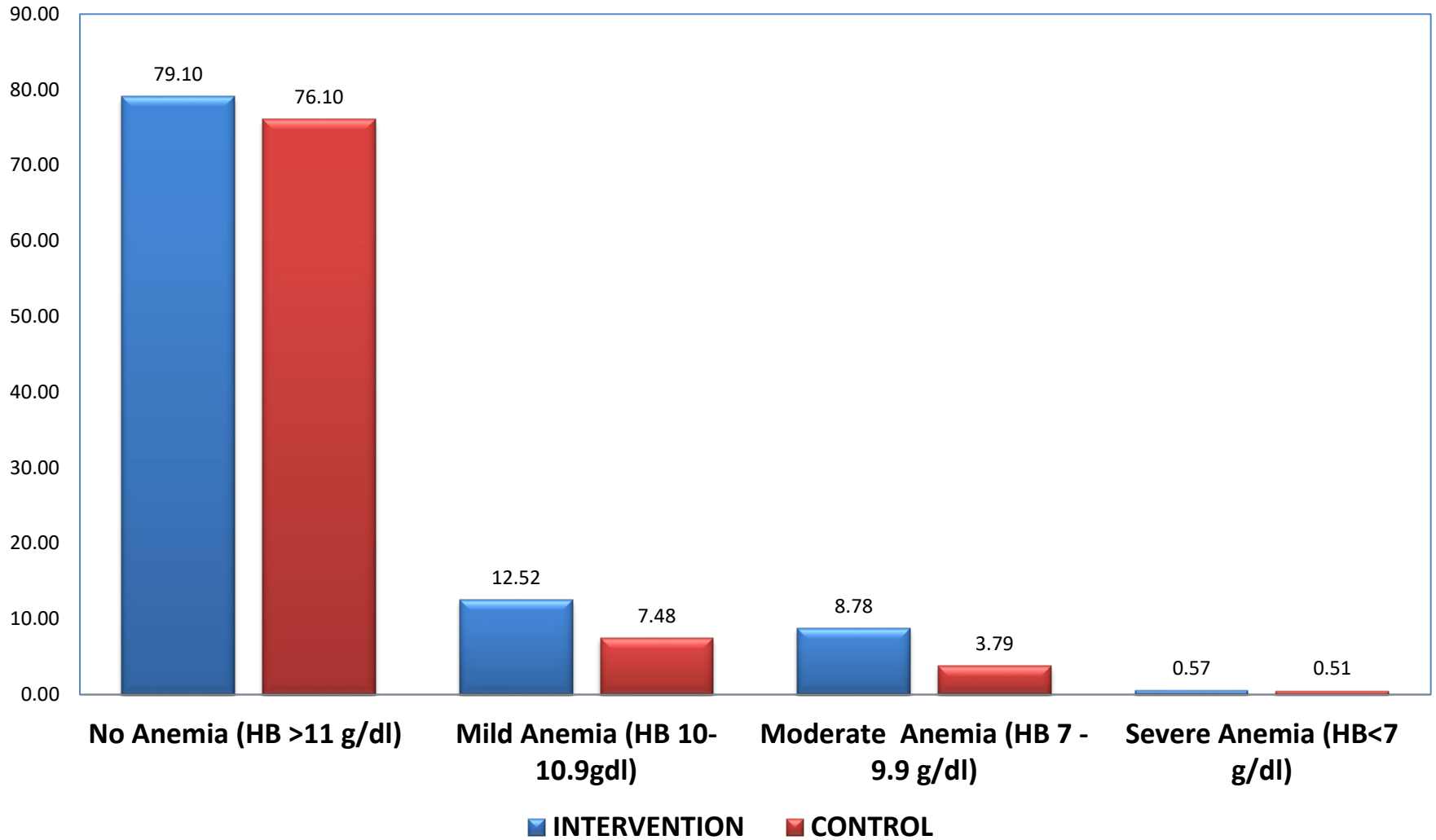
Maternal Wasting

MUAC MATERNAL WASTING (NOURISHMENT) CONTROL VS INTERVENTION



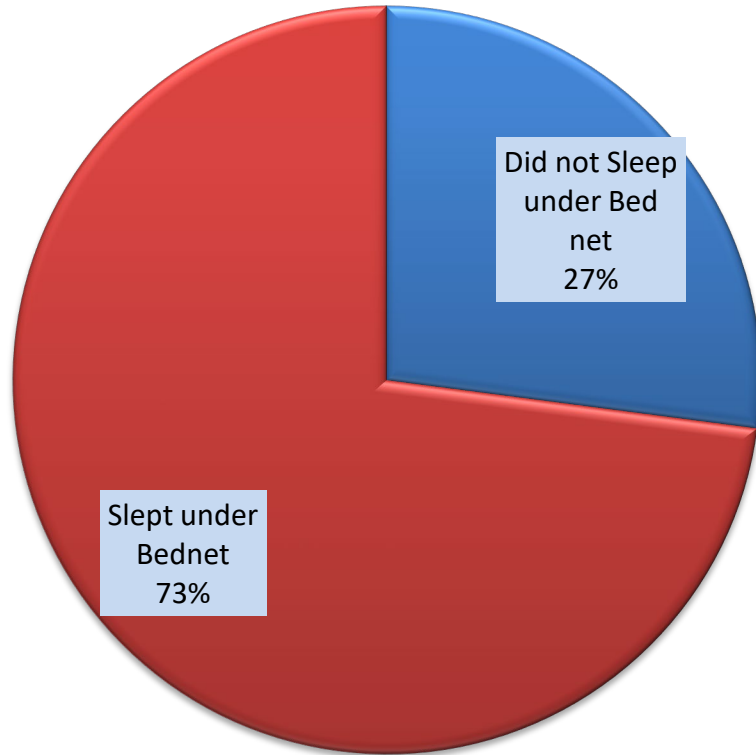
Maternal Anemia

Prevalence of Anemia in Women 15 to 49 Years

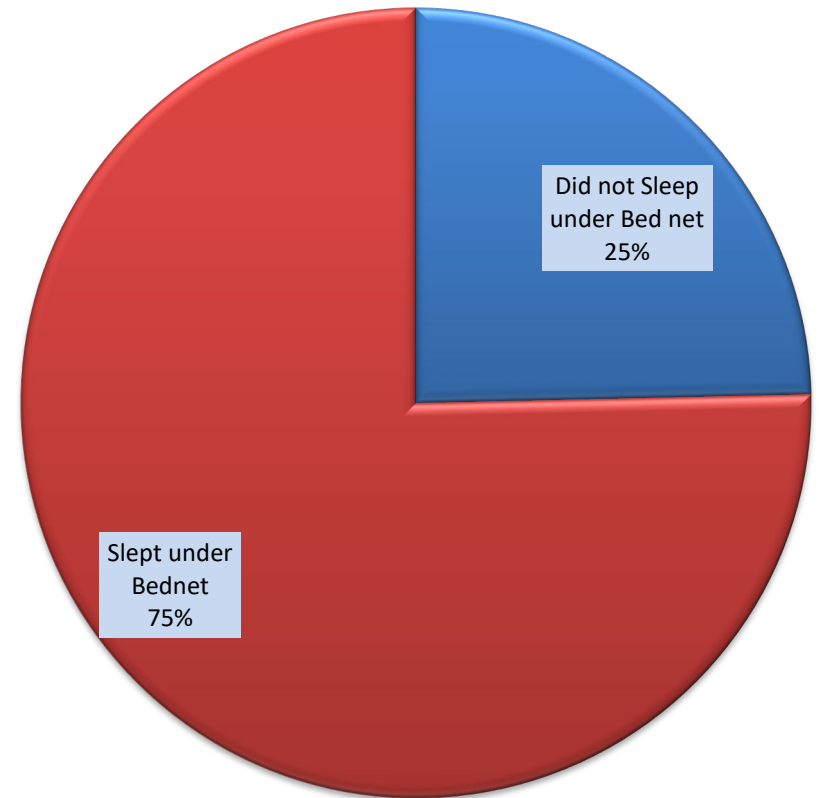


Maternal Health Status & Pregnancy

Intervention Group -Percentage of Women Who Slept Under a Bednet

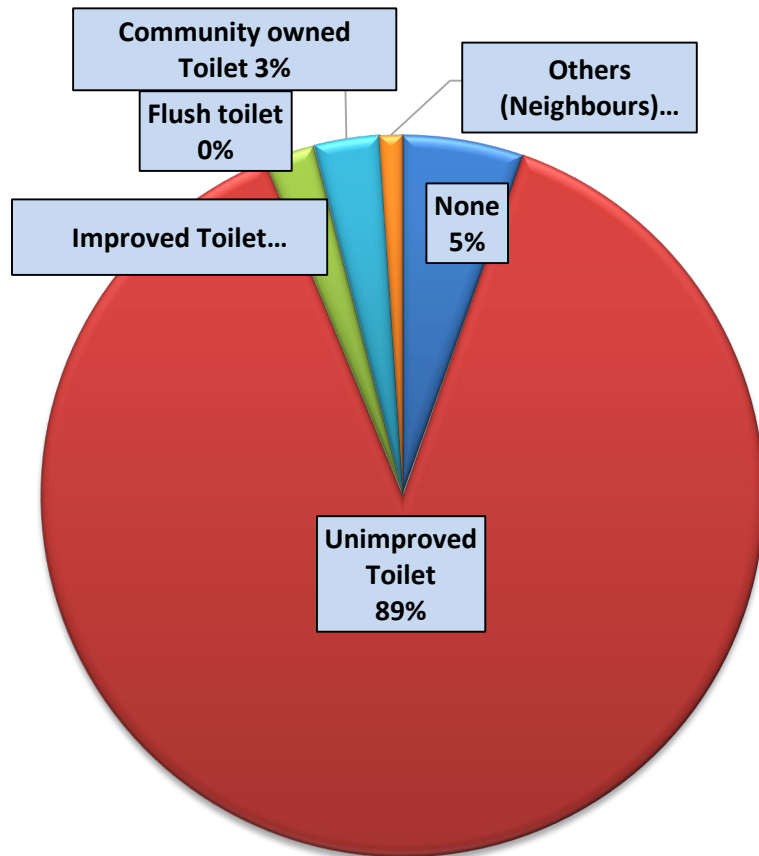


Control Group -Percentage of Women Who Slept Under a Bednet

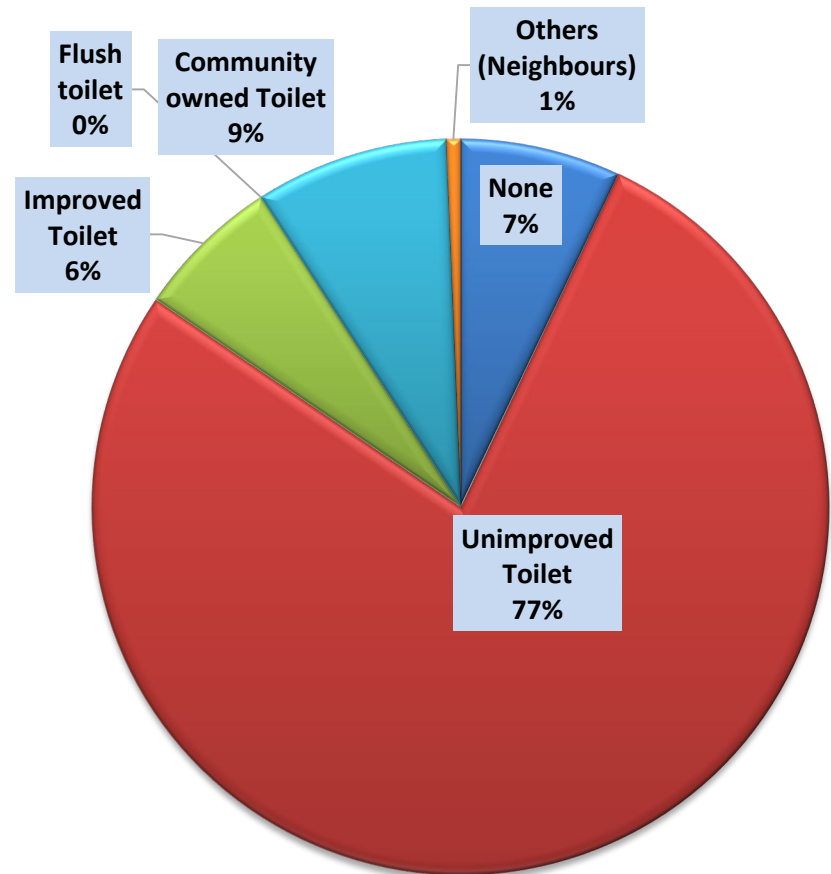


Water, Sanitation and Hygiene

INTERVENTION -Common Types of Toilet used by Households

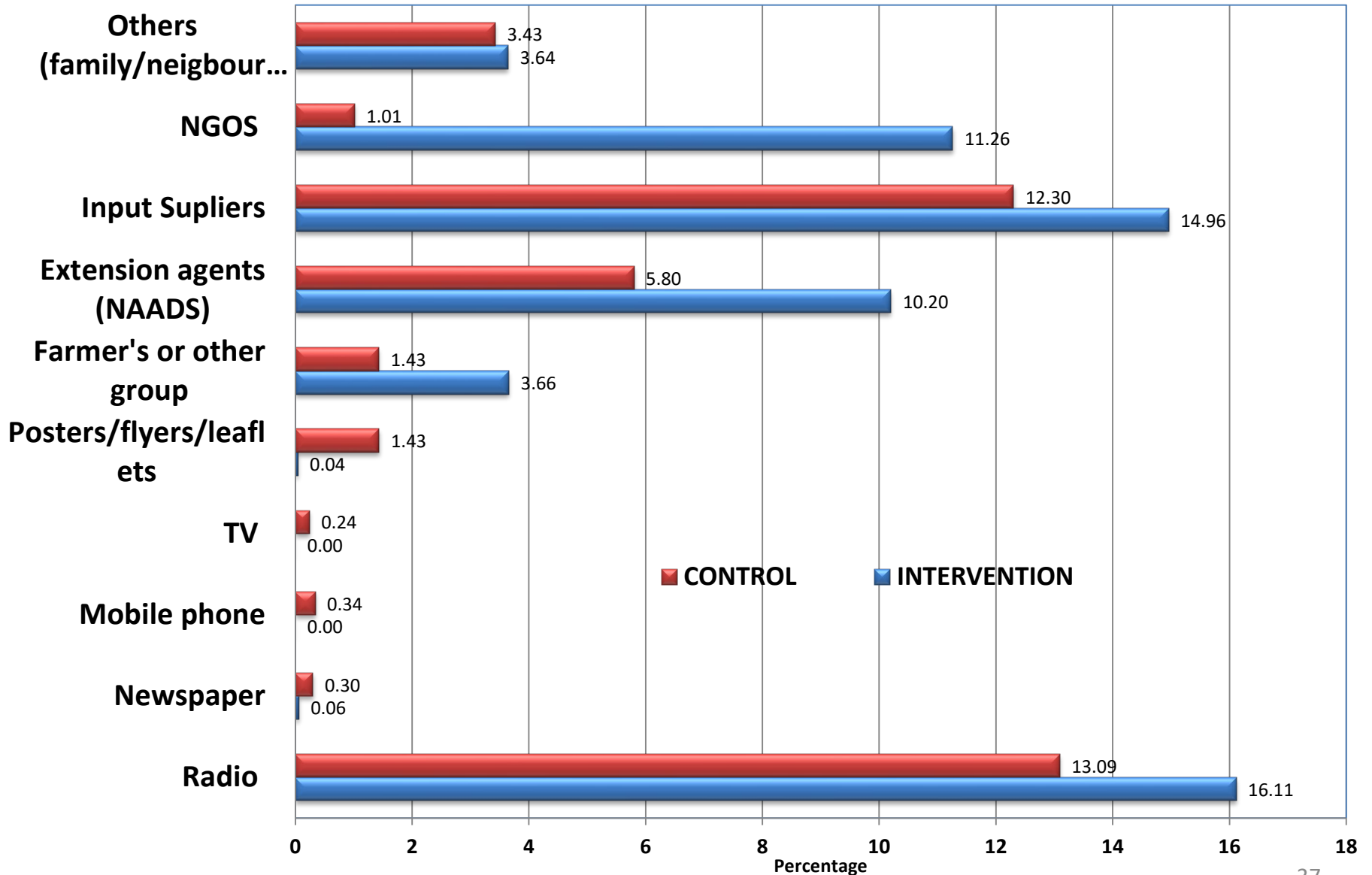


CONTROL-Common Types of Toilet used by Households



Sources of nutrition information

SOURCES OF NUTRITION INFORMATION





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REGIONAL DIFFERENCES

SELECTED INDICATORS



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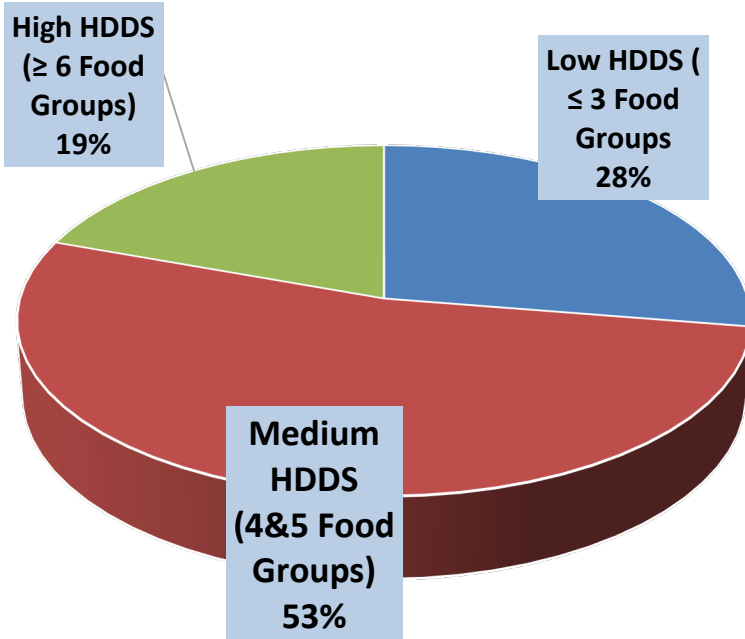
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Household Dietary Diversity scores

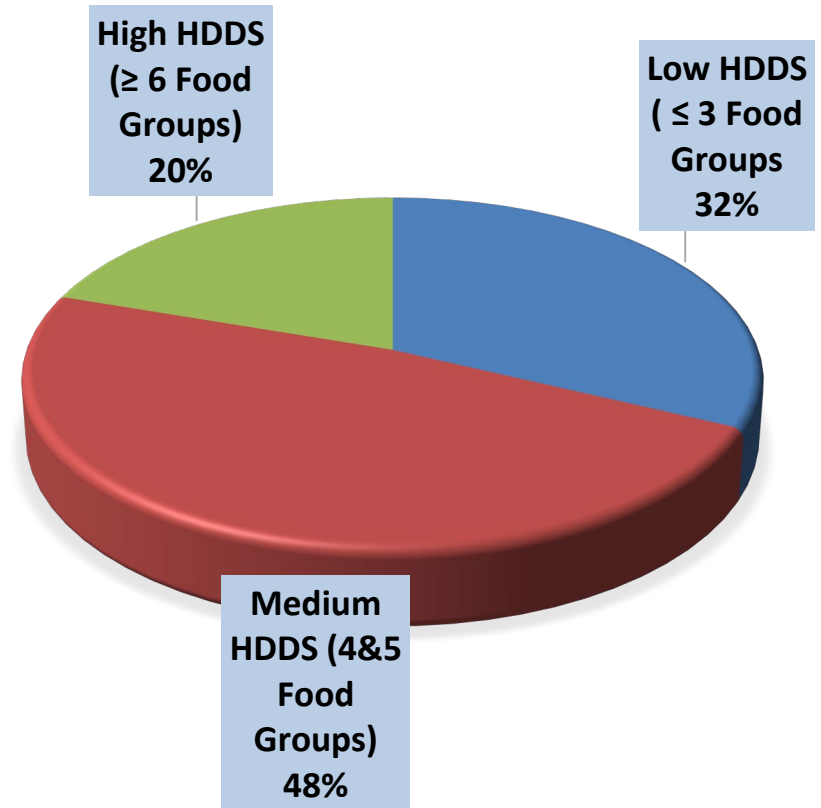


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Western Region- Household Dietary Diversity Scores

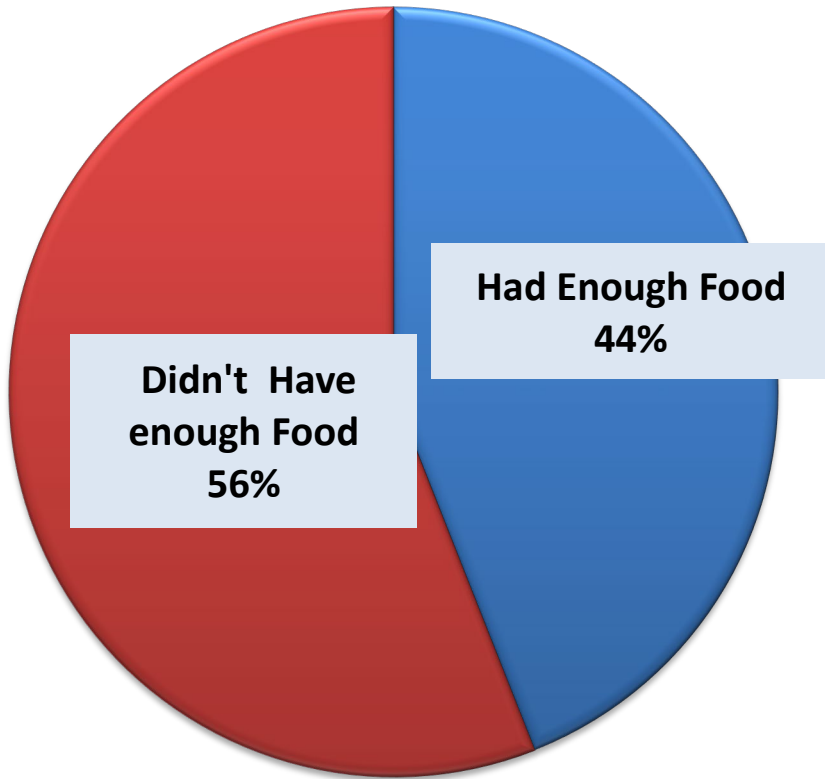


NORTHERN REGION- HOUSEHOLD DIETARY DIVERSITY SCORES

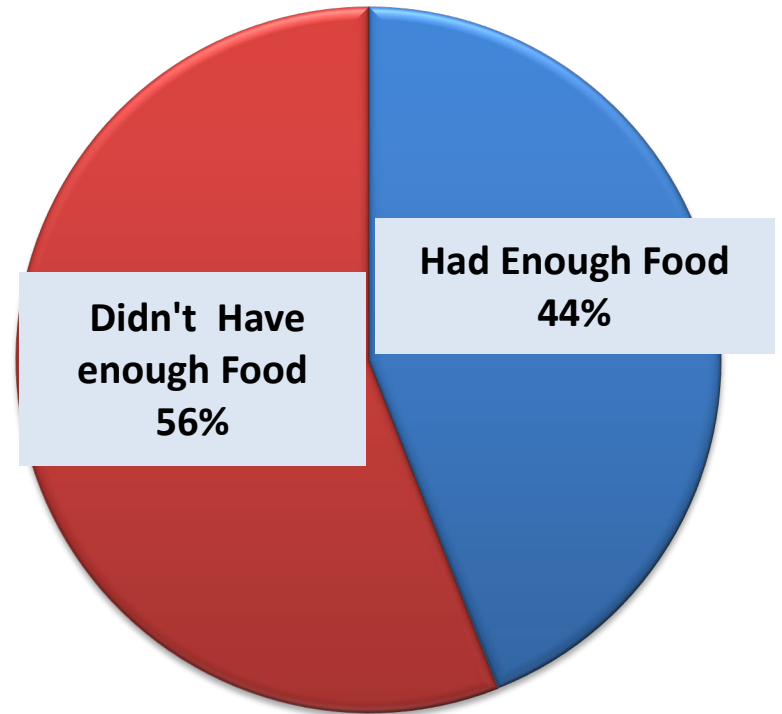


Household Food Provisioning (MAHFP)

Western Region-Adequate Household Food Provisioning (MAHFP) in last 12 Months



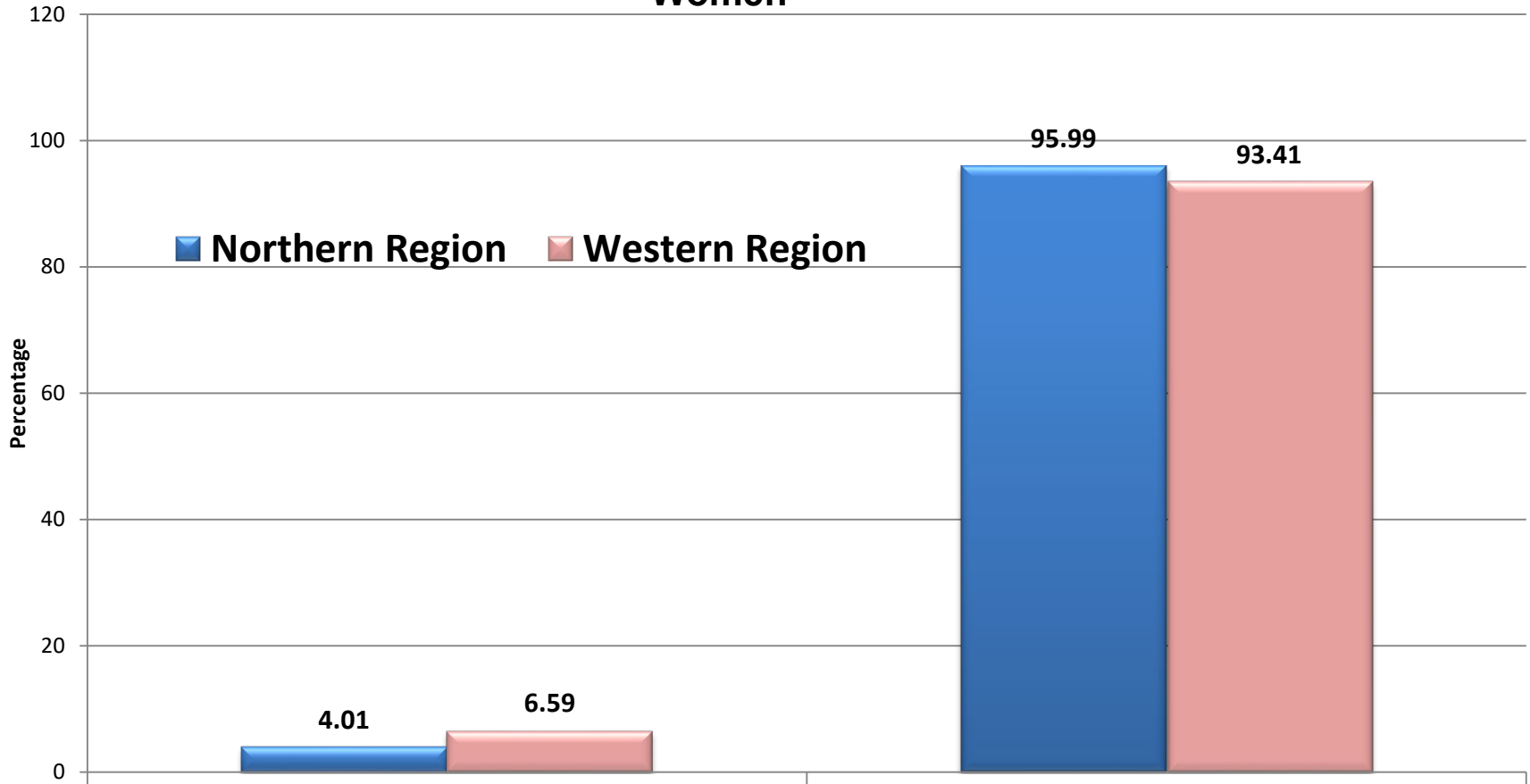
Western Region-Adequate Household Food Provisioning (MAHFP) in last 12 Months





Maternal Wasting

Regional Mid Upper Arm Circumference (MUAC) for Pregnant Women



MUAC ≤ 23cm

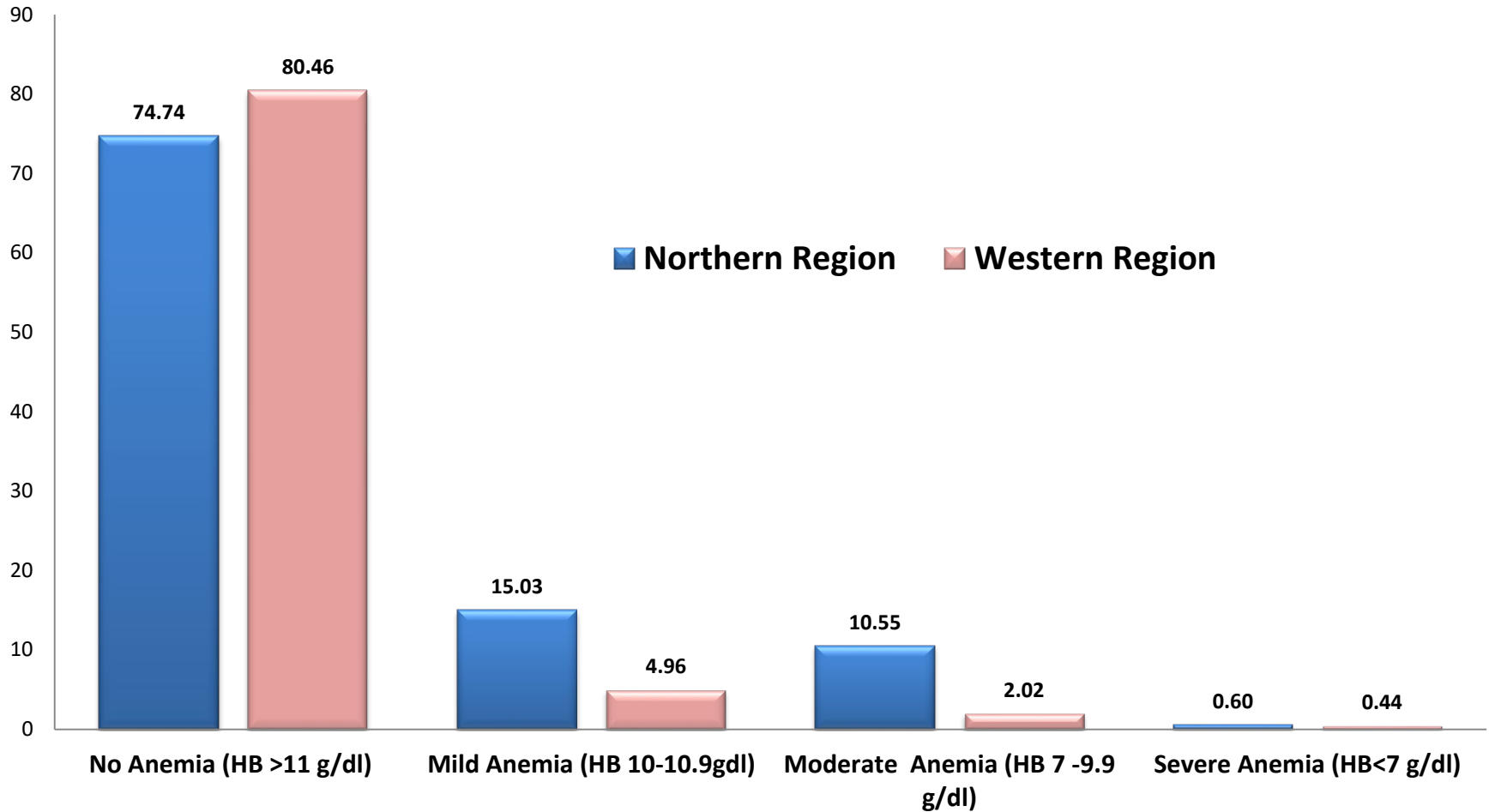
MUAC ≥ 23cm





Maternal Anemia

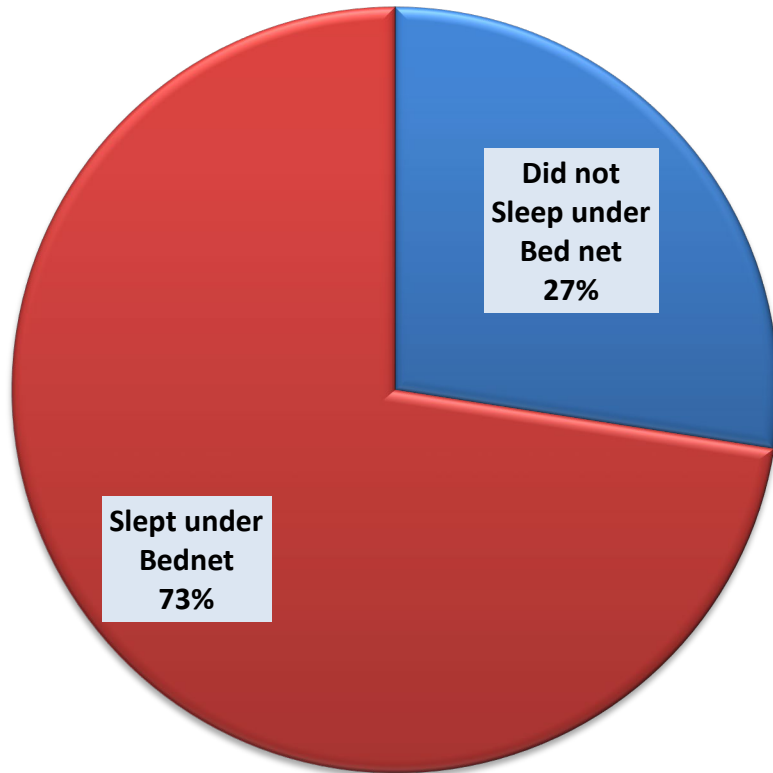
Regional Comparison of Prevalence of Anemia in Women 15 to 49 Years



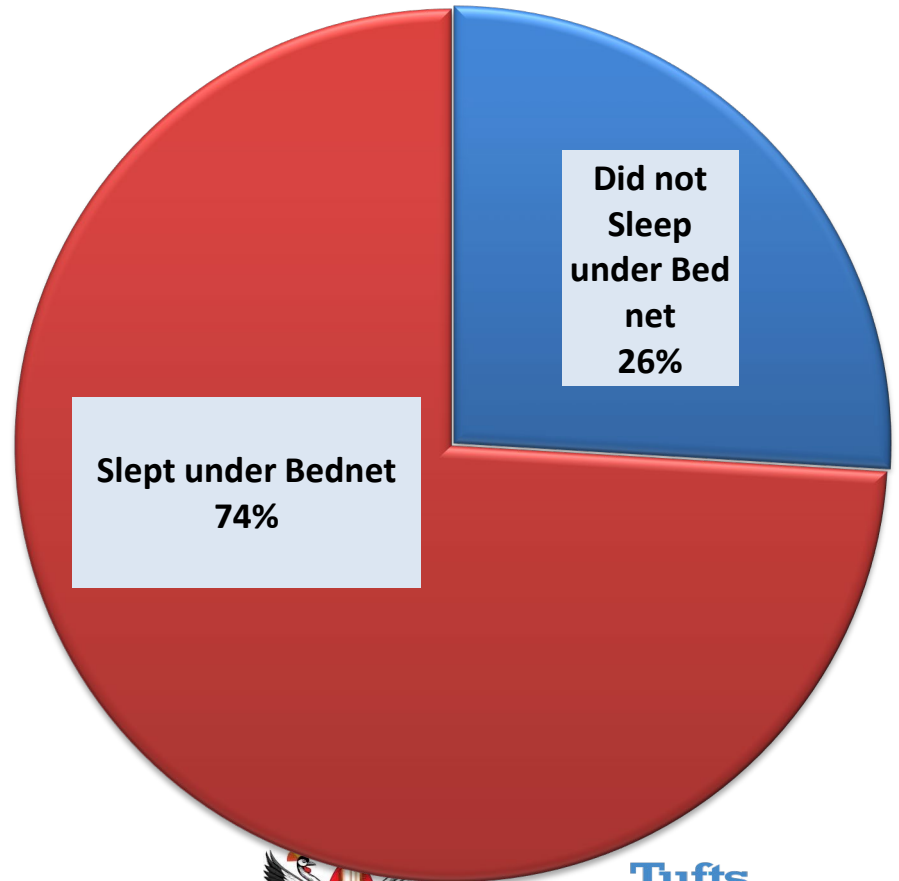


Maternal Health Status & Hygiene

Northern Region - Percentage of Women Who Slept Under a Bednet



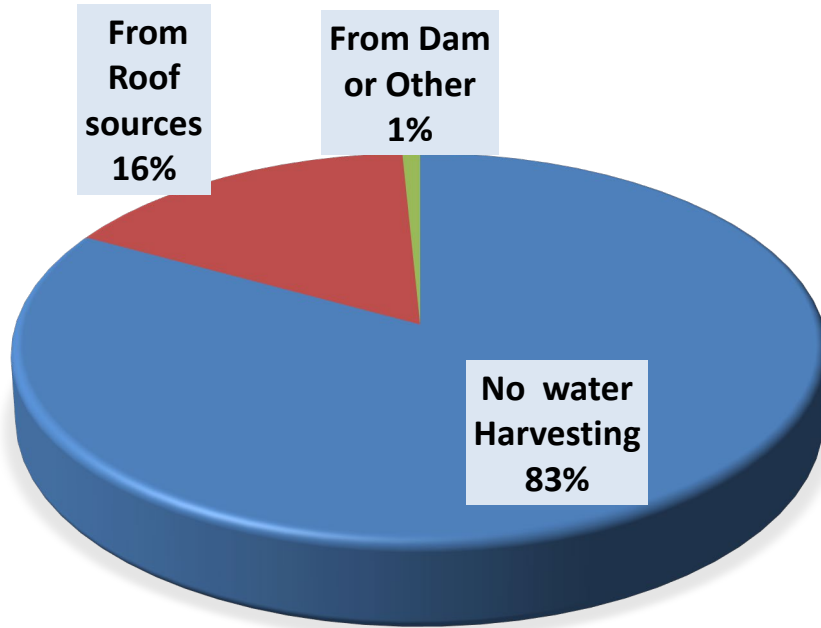
Western Region-Percentage of Women Who Slept Under a Bednet



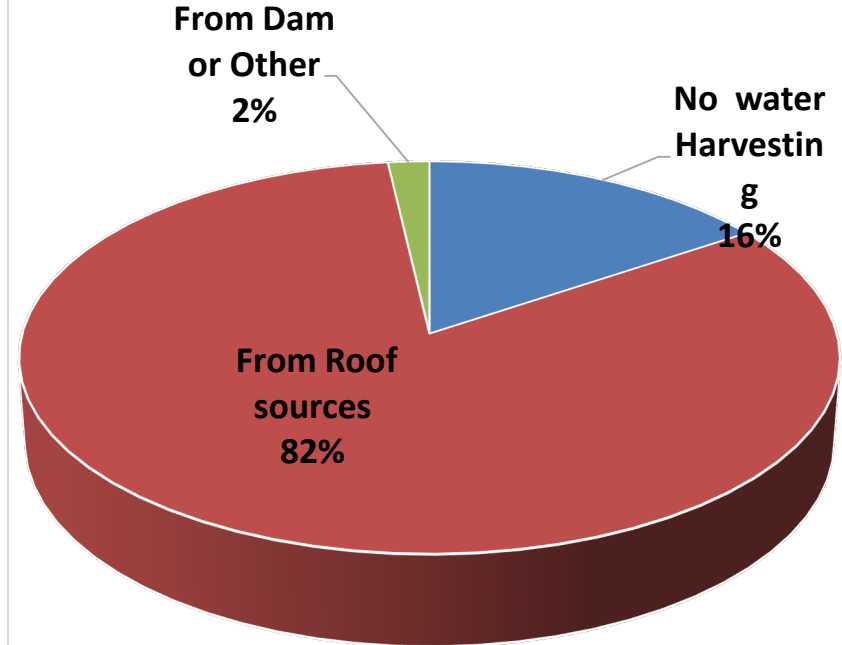


Water Sanitation & Hygiene

NORTHERN REGION- PERCENTAGE OF HOUSEHOLDS HARVESTING RAINWATER



WESTERN REGION - PERCENTAGE OF HOUSEHOLDS HARVESTING RAIN WATER

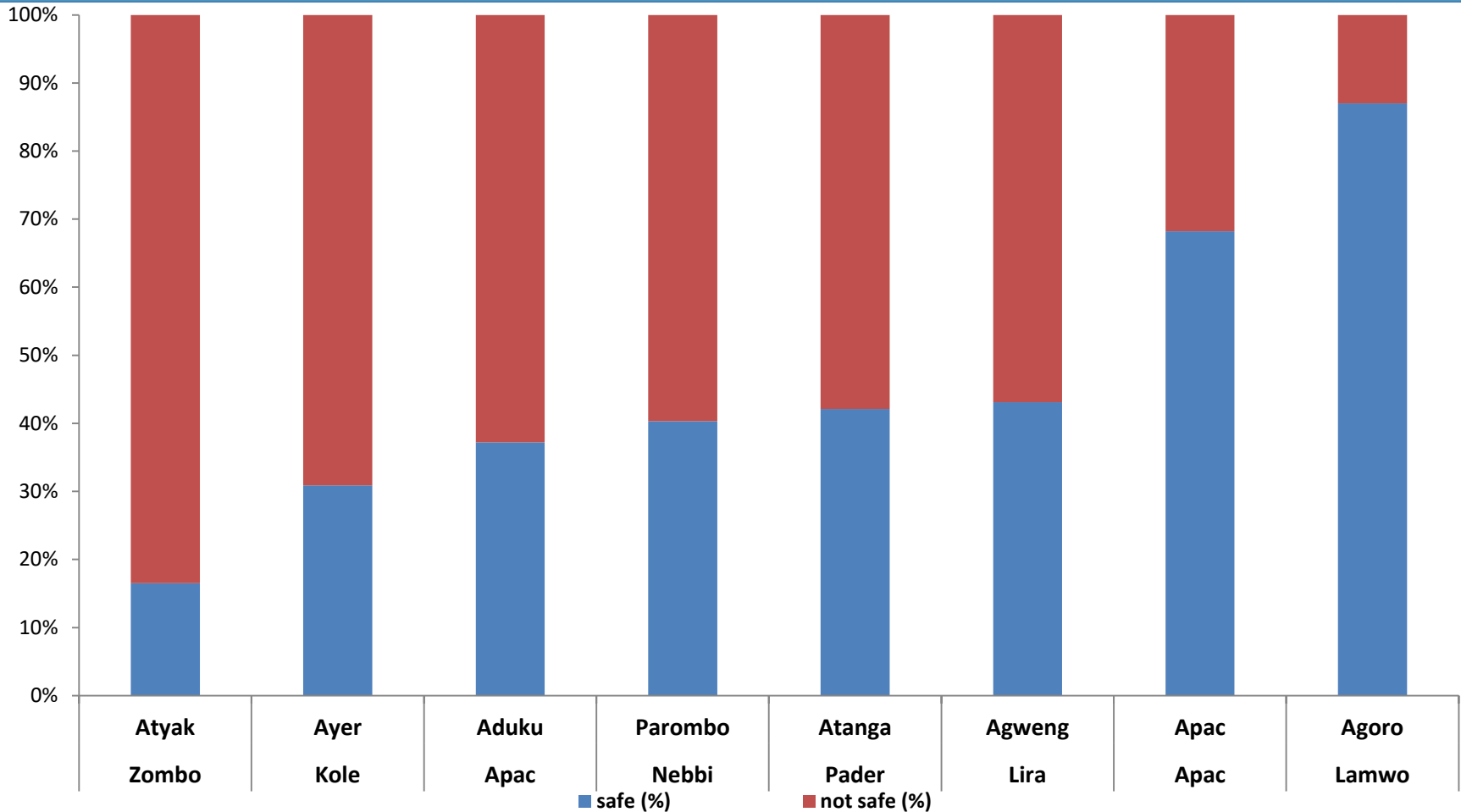




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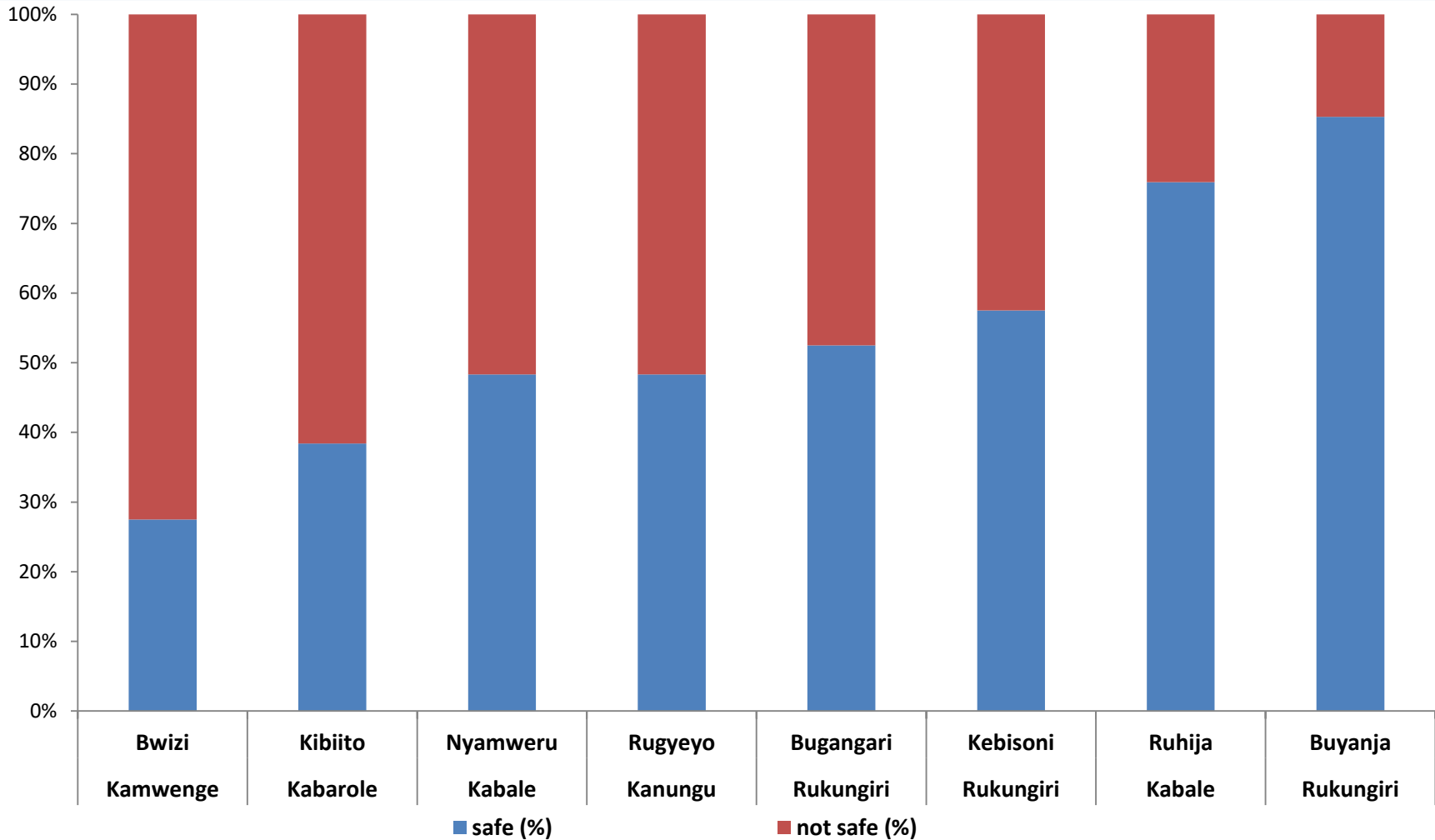
Safety of water in the home-North





FEED THE FUTURE Safety of water in the home-SW

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Sources of Nutrition information

Regional sources of Nutrition Information

