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Strengthening Partnerships, Results  
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# SURVEY REPORT RESULTS ON NUTRITION INDICATORS FROM SIX DISTRICTS IN SOUTHWEST AND EAST CENTRAL UGANDA



The Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING) project is supported by the U.S. Agency for International Development (USAID) under Cooperative Agreement No. AID-OAA-A-11-00031. SPRING is managed by JSI Research & Training Institute, Inc.



# **SURVEY REPORT RESULTS ON NUTRITION INDICATORS FROM SIX DISTRICTS IN SOUTHWEST AND EAST CENTRAL UGANDA**

**MAY 2014**

This report is made possible by the generous support of the American people through the US Agency for International Development (USAID) under the terms of the Cooperative Agreement AID-OAA-A-11-00031 (SPRING), managed by the JSI Research & Training Institute, Inc. (JSI). The contents are the responsibility of JSI, and do not necessarily reflect the views of USAID or the US Government.



## ABOUT SPRING

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a five-year USAID-funded Cooperative Agreement to strengthen global and country efforts to scale up high-impact nutrition practices and policies and improve maternal and child nutrition outcomes. The project is managed by the JSI Research & Training Institute, Inc., with partners Helen Keller International, The Manoff Group, Save the Children, and the International Food Policy Research Institute. SPRING provides state-of-the-art technical support and focuses on the prevention of stunting and maternal and child anemia in the first 1,000 days.

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## SPRING

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## ACRONYMS

AIDS	acquired immunodeficiency syndrome
ANC	antenatal care
BCC	behavior change communication
EC	East Central
HIV	human immunodeficiency virus
IYCF	infant and young child feeding
JSI	JSI Research & Training Institute, Inc.
LQAS	Lot Quality Assurance Sampling
MOH	Ministry of Health
MTCT	mother-to-child transmission
NACS	nutrition assessment, counseling, and support
PHFS	Partnership for HIV-Free Survival
SA	supervision area
SBCC	social and behavior change communication
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
STAR-EC	Strengthening Tuberculosis and HIV/AIDS Responses in East Central Uganda
STAR-SW	Strengthening Tuberculosis and HIV/AIDS Responses in Southwest Uganda
SW	Southwest
UAC	Uganda AIDS Commission
UDHS	Uganda Demographic Household Survey
USAID	U.S. Agency for International Development
WHO	World Health Organization

## HIGHLIGHTS

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a five-year cooperative agreement funded by the U.S. Agency for International Development (USAID) that began in October 2011. SPRING's overarching vision is to prevent stunting and to work with women and children on reducing anemia through social and behavior change communication (SBCC) for nutrition; maternal, infant, and young child nutrition programming with a focus on the first 1,000 days; and implementation research that addresses the challenges of delivering effective nutrition programming at scale. As part of its start-up phase, the SPRING/Uganda team conducted a baseline survey on nutrition, HIV, and child health-related indicators using the Lot Quality Assurance Sampling (LQAS) methodology to guide program implementation. Of the six districts where this survey was conducted, three (Kisoro, Ntungamo, and Namutumba) are SPRING intervention districts, and the other three (Buhweju, Rubirizi, and Mayuge) were used as control districts.

SPRING/Uganda's primary goals are reducing stunting levels in children aged 0–23 months and anemia in children 0–23 months and women of childbearing age. The project has a secondary goal of reducing the proportion of children and adults with severe acute malnutrition in Southwest (SW) Uganda. Given these goals, the implementation team highlighted a number of key indicators to be used for tracking program effectiveness. These key indicators include nutrition practices, access to quality nutritious foods, and utilization of health and community services that improve nutrition. This study collected data on key indicators at the household level, including the indicators listed in Table 1. In addition, SPRING/Uganda has a focus on SBCC as a tool for improving nutrition outcomes. To enhance SBCC programming, the study also collected data on exposure to nutrition messaging. These findings are included in section 3.6 and Appendix 2 of this report.

Details on the survey methodology and specifics on most of the findings can be found in the main body of this report. While results for many of the indicators are fairly well-balanced between intervention and control districts, there are a few key indicators for which estimates vary significantly between districts, including breastfeeding practices, complementary feeding practices, and indicators around health service utilization and consumption of fortified foods. These findings, as well as differences between regions for a number of indicators, highlight the fact that nutrition programming must be context-specific to address the varying levels of current practices. SPRING/Uganda must closely track implementation in their intervention districts, as well as changes in programming in the control districts, in order to be able to compare changes over time between the two sets of districts.

**Table A. Key Survey Findings**

INDICATORS AND DEFINITIONS	SOUTHWEST DISTRICTS				P-value (intervention vs. control)	EAST CENTRAL DISTRICTS			
	Intervention Districts		Control Districts			Intervention District		Control District	
	Ntungamo & Kisoro	Buhweju & Rubirizi	Total South-west Districts	Total East Central Districts		Namutumba	Mayuge	Total East Central Districts	P-value (intervention vs. control)
<b>Early initiation of breastfeeding:</b> % of children born in the last 24 months who were put to breast within one hour of birth.	83.4	72.9	78.1	76.8	$p < 0.001$	76.3	77.4	76.8	$p = 0.808$
<b>Exclusive breastfeeding under 6 months:</b> % of infants 0–5 months who are fed exclusively with breastmilk	63.7	59.1	61.2	41.2	◇	◇	◇	41.2	
<b>Continued breastfeeding at one year:</b> % of children 12–15 months of age who are fed breastmilk	82.6†	87.7†	85.1	89.4†	$p = 0.409$	95.2†	83.7†	89.4†	$p = 0.084$
<b>Introduction of solid, semi-solid, or soft foods:</b> % of infants 6–8 months who received solid, semi-solid, or soft foods	72.7†	92.7†	81.3	89.4†	$p = 0.013$	◇	◇	89.4†	
<b>Minimum dietary diversity:</b> % of children 6–23 months who received foods from four or more food groups	43.3	53.3	48.1	51.6	$p = 0.017$	51.0	52.3	51.6	$p = 0.830$
<b>Minimum meal frequency:</b> % of breastfed and non-breastfed children 6–23 months who received solid, semi-solid, or soft solid (but also including milk feeds for non-breastfed children) the minimum number of times or more	37.7	56.9	47.1	33.9		33.8	34.1	33.9	
<b>Minimum acceptable diet:</b> % of children 6–23 months who received a minimum acceptable diet (apart from breastmilk)	17.0	24.5	20.6	19.4		21.2	17.4	19.4	
<b>Consumption of iron-rich or iron-fortified foods:</b> % of children 6–23 months who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home	17.3	41.6	29.1	41.0	$p < 0.001$	35.1	47.7	41.0	$p = 0.031$
<b>Children ever breastfed:</b> % of children born in the last 24 months who were ever breastfed	97.9	96.9	97.4	90.4	$p = 0.377$	95.8	85.0	90.4	$p = 0.002$

**ADDITIONAL INDICATORS**

% of biological mothers of children 6–23 months who reported that their children consumed any food to which they added a powder or sprinkles within the last 24 hours prior to the survey	2.1	1.1	1.6	p = 0.322	4.8	1.1	3.0†	p = 0.074
% of biological mothers of children 6–23 months who reported that their children consumed any food to which they added a powder or sprinkles within the last 6 months prior to the survey	8.1	5.1	6.5	p = 0.186	6.7	4.9	5.9	p = 0.740
% of pregnant women attending ANC at least one time during the last pregnancy	97.1	97.9	97.5	p = 0.471	97.9	98.4	98.2	p = 0.703
% of pregnant women attending ANC at least four times during the last pregnancy	49.5	63.5	56.5	p = 0.001	54.7	55.3	55.0	p = 0.046
% of deliveries that were assisted by a trained /skilled health service provider (doctor/nurse/midwife/nursing aide)	75.0	68.0	71.5	p = 0.031	74.7	76.3	75.5	p = 0.720
% of deliveries that took place in a health facility	71.1	68.0	69.5	p = 0.355	74.7	81.6	78.2	p = 0.107
% of women who reported having taken any drug for intestinal worms during their last pregnancy	59.8	64.2	62.1	p = 0.001	48.6	66.7	57.7	p = 0.002
% of households that consumed <b>fortified maize flour</b> during the last 7 days prior to the survey	19.2	5.0	12.0	p < 0.001	2.6	30.5	16.6	p < 0.001
% of households that consumed <b>fortified cooking oil</b> during the last 7 days prior to the survey	17.9	15.4	16.6	p < 0.001	45.8	59.0	52.4	p < 0.001
% of households that consumed <b>fortified salt</b> during the last 7 days prior to the survey	69.5	72.7	71.1	p = 0.246	73.7	67.9	70.8	p < 0.001

Note: Sample is proportional to number of districts in a region; therefore, the Southwest sample is double the size of the East Central sample.

◇: Sample size is too low for results to be disaggregated.

†Sample size is low, but results can be used as a proxy.

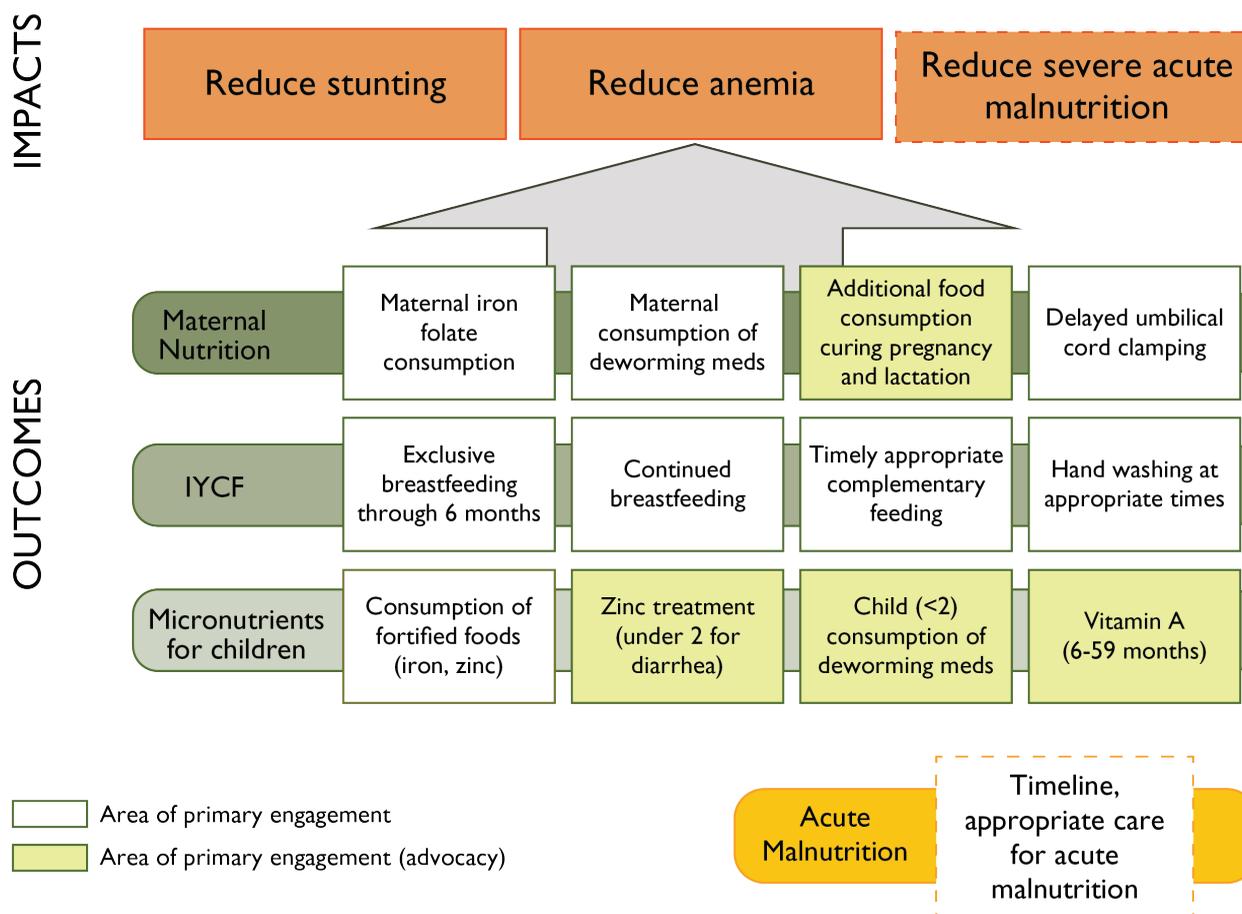
# I.0 INTRODUCTION

## I.1 BACKGROUND

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a five-year cooperative agreement funded by the U.S. Agency for International Development (USAID) that began in October 2011. SPRING’s overarching vision is to prevent stunting and work with women and children on reducing anemia through: social and behavior change communication (SBCC) for nutrition; maternal, infant, and young child nutrition programming with a focus on the first 1,000 days; and implementation research that addresses the challenges of delivering effective nutrition programming at scale.

SPRING/Uganda’s USAID-funded work began in Kisoro and Ntungamo in 2012 to integrate malnutrition treatment and prevention services in selected health facilities, and to support the development and implementation of a comprehensive package of high-impact nutrition services through capacity and systems strengthening at the facility, community, and district levels. The interventions have been designed to reduce levels of stunting, anemia, and severe acute malnutrition.

**Figure 1. SPRING/Uganda Building Blocks for Program Impact Pathway**



SPRING/Uganda's primary goals are reducing stunting levels in children aged 0–23 months and anemia in children 0–23 months and women of child-bearing age. The project has a secondary goal of reducing the proportion of children and adults with severe acute malnutrition in Southwest (SW) Uganda. The interventions include increased demand for nutrition prevention and treatment services, increased availability of nutrition services at the facility and community level, increased access and coverage of targeted nutrition interventions for vulnerable groups, improved quality of nutrition services at the facility and community level, and advocacy at the national level to improve the social and policy environment for nutrition programs. The project impact pathway is shown in Figure 1.

In late 2012, SPRING entered into agreement with the Partnership for HIV-Free Survival (PHFS) to implement their intervention in SPRING's two existing districts (Ntungamo and Kisoro) in SW Uganda, as well as Namutumba in the East Central (EC) region. For PHFS, the project will contribute to the elimination of mother-to-child-transmission (MTCT) through targeted nutrition assessment, counseling, and support (NACS) interventions during the first 1,000 days (prior to conception, during pregnancy, at delivery, and postpartum period up to 24 months of a child's life). The PHFS intervention layers on top of SPRING's interventions, with the goal of contributing to the reduction of MTCT of human immunodeficiency virus (HIV) from 15 percent to 3 percent by 2015. This will be done through integrating NACS into ongoing antenatal and postnatal interventions. Activities include capacity building of service providers in NACS and quality improvement, creating demand for services through community mobilization, strengthening the health service delivery system, and strengthening monitoring and evaluation for nutrition services within HIV/AIDS services.

Prior to the addition of PHFS interventions to SPRING's mandate, SPRING had designed an analysis plan and survey protocol to measure the effects of SPRING's intervention, to be fielded in early 2013. Given this new partnership, and the knowledge that many other partners are working on similar goals in SPRING districts, the project explored alternative data collection and analysis options to reduce redundancy of surveys in these districts and to strengthen the project's ability to collectively show changes in these districts, disregarding attribution to one single project.

While many of the SPRING's key indicators must be tracked through facility-level data, especially those for the PHFS programming, this survey was designed to get information about household-level actions related to nutrition. These indicators can be used both to shape programming, through a better understanding of current nutrition practices and access to information, as well as to track the effect of implementation, since many of these same indicators are outcomes that SPRING aims to affect. These key household indicators include utilization of health services during pregnancy, nutrition practices during the 1,000 days, and household knowledge of and access to nutrition information.

Over the last four years, the Lot Quality Assurance Sampling (LQAS) methodology used in this survey has been successfully used by the USAID/Strengthening Tuberculosis and HIV/AIDS Responses in East Central Uganda (STAR-EC) program as well as other organizations in Uganda and elsewhere to establish the progress of different national-, district-, and program-level indicators at the community level. Based on this and several other advantages this methodology possesses when compared to other survey methodologies, SPRING undertook this activity using the same methodology.

## I.2 SURVEY OBJECTIVES

The survey objectives were to collect and analyze nutrition and HIV survey data in six districts of SW and EC Uganda, using LQAS techniques at the subcounty level, with lot samples collected so that they can be rolled up to aggregated random samples at the district level.



Data collectors travel to an island village for carrying out the survey (photo credit: Alexis D'Agostino, SPRING).

This survey activity was conducted to help SPRING collect baseline information to use during program planning, annual program progress follow-up, and during final evaluation of the program, with a focus on indicators related to knowledge of infant and young child feeding (IYCF) practices, exposure to SBCC messaging around these topics, as well as additional indicators related to HIV/AIDS awareness and practices. All of these are indicators relevant to SPRING's programming and interventions in its three intervention districts. Data was also collected in three control districts of Mayuge in the EC region as well as Rubirizi and Buhweju districts in SW Uganda.

## I.3 LITERATURE REVIEW OF NUTRITION AND IYCF PRACTICES

The 2002 *Global Strategy for Infant and Young Child Feeding* was developed by the World Health Organization (WHO) and UNICEF jointly, to revitalize world attention to the impact that feeding practices have on the nutritional status, growth, development, and health, and thus the very survival, of infants and young children. Malnutrition has been responsible, directly or indirectly, for over 50 percent of the 10.6 million deaths annually among children under five. Well over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life (WHO 2013).

## NUTRITION STATUS IN UGANDA

According to the Food and Agricultural Organization (FAO), plantain, starchy roots (cassava, sweet potatoes), and cereals (maize, millet, sorghum) make up most of the Ugandan diet, which is complemented by smaller amounts of pulses, nuts, and green leafy vegetables (FAO 2013). Rice is increasing in popularity in urban areas, but the Ugandan diet is generally lacking in micronutrient-rich foods, and the share of lipids and protein are very low. According to the FAO, food insecurity in the country is mainly due to poverty, adverse climate, low agricultural productivity, and civil insecurity. These factors are combined in Karamoja, a district with high rates of food insecurity. Undernourishment has decreased in the past 10 years but still affects 15 percent of the population.

Early initiation of breastfeeding and exclusive breastfeeding through six months of age are practices which are slowly increasing, but they are still not common throughout all parts of Uganda, and complementary feeding is not very diverse. According to the FAO, “these inappropriate practices, along with high morbidity, poverty and food insecurity, are major determinants of malnutrition among young children” (2013). The country as a whole has high levels of malnutrition; 33 percent of children under five are stunted, according to the 2011 *Uganda Demographic Household Survey (UDHS)*, with 42 percent in the SW. Twelve percent of adult women suffer from undernutrition, and there are particularly high levels in the east and northern parts of the country. Uganda is currently undergoing a nutrition transition, mainly in urban areas, where over a third of women are overweight, with rates as high as 40 percent in Kampala District. According to the FAO nutrition profile, vitamin A supplementation is limited among children and women. Anemia affects half of all children under five and nearly a quarter of women of childbearing age (UBOS & Macro International Inc. 2011,2008). The immediate causes include inadequate dietary intake and disease. Malnutrition is a complex issue with many interconnected determinants. Table 1 shows national levels for a number of indicators that affect nutrition status and programming effectiveness. In addition to national averages, the table shows the rates for each indicator in the Southwest, the location of SPRING districts Kisoro and Ntungamo, and East Central, the location of SPRING district Namutumba, regions. The Southwest region has higher performance than the East Central region on nearly all indicators included in Table 1. Notable exceptions to this pattern are use of modern contraceptive methods, adult HIV prevalence, and observed place for handwashing in the home.

**Table 1. Prevalence of Nutrition Determinants at National and Regional Level in Uganda, 2011**

INDICATOR	NATIONAL LEVEL	SOUTHWEST	EAST CENTRAL
Percentage of population in the lowest wealth quintile	20	6.3	12.1
Percentage of children age 6–23 months fed a minimum acceptable diet	5.8	4.7	0.9
Percentage of households where place for washing hands was observed	29	20.5	30.6
Percentage of children under five with diarrhea in in two weeks preceding the survey	23.4	14.0	31.9
Percentage of children under five with symptoms of acute respiratory illness	14.8	10.6	15.1
Adult male HIV prevalence	6.1	6.6	4.8
Adult female HIV prevalence	8.3	9.0	6.7
Percentage of children under five who had a fever in the two weeks preceding the survey	40.4	12.7	69.3
Percentage of children under five with fever for whom treatment was sought from a health facility or provider	80.1	69.7	67.1
Percent of married women 15–49 using any modern method of contraception	26	25.1	27.7

Source: UBOS & Macro International Inc. 2011; Uganda MOH and ICF International 2012.

Household income obviously plays a large role in availability of food within the household, but it is important to have more information on what food is consumed by children and when. More details on IYCF practices, which explain part of dietary intake, are given in the next section, but Table 1 includes rates of children fed a minimum acceptable diet. Sanitation, represented in the table below by observation of a place for handwashing, also plays an important role in health status, affecting absorption of key nutrients. Rates of diarrhea can also suggest sanitation-related health issues that may affect nutrition status. Along with rates of various health issues, the table below allows an understanding of the context in which the SPRING nutrition intervention will be implemented. While the Southwest region generally outperforms East Central, both regions perform around or below the national average for many of the indicators, highlighting the need for a multi-pronged and multi-stakeholder effort to combat malnutrition.

### SOME OF THE IYCF INDICATOR UGANDAN RESULTS

According to the 2011 UDHS; overall, 63 percent of children under six months are exclusively breastfed, a slight improvement from 60 percent reported in 2006. Among subgroups, 82 percent of children less than two months of age are exclusively breastfed, but this percentage drops sharply

at subsequent ages. In addition to breastmilk, 5 percent of infants under six months are given plain water only, 4 percent are given non-milk liquids and juice, and 9 percent receive other milk in addition to breastmilk. Eighteen percent of children under six months are given complementary foods in addition to breastmilk, indicating that very young children are mostly fed breastmilk. All children aged 6–9 months, in contrast, should receive complementary foods. However, 77 percent of children 6–9 months received complementary foods the day or night preceding the survey. Bottle feeding is becoming more common in Uganda; 15 percent of children under six months are using a bottle with a nipple, an increase from 11 percent in 2006. Bottle feeding peaks at 29–30 percent among children 4–11 months old (UBOS & Macro International Inc. 2011).

As part of this study, IYCF indicators were assessed and these included core and optional indicators listed in the WHO document *Indicators for Assessing Infant and Young Child Feeding Practices* (2010). The assessed core indicators included: early initiation of breastfeeding; exclusive breastfeeding under six months; continued breastfeeding at one year; introduction of solid, semi-solid, or soft foods; minimum dietary diversity; minimum meal frequency; minimum acceptable diet and consumption of iron-rich or iron-fortified foods. Additionally, optional indicators assessed included: children ever breastfed; continued breastfeeding at two years; age-appropriate breastfeeding; predominant breastfeeding under six months; duration of breastfeeding; bottle feeding as well as milk feeding frequency for non-breastfed children.

## 2.0 METHODOLOGY

### 2.1 A BRIEF BACKGROUND OF THE LQAS METHODOLOGY

The LQAS methodology was developed in the United States in the 1920s and is widely used in the manufacturing industry for quality control of goods produced on a production line. This methodology involves taking a small random sample of a manufactured batch (lot) and testing the sampled items for quality. If the number of defective items in the sample exceeds a predetermined criteria (decision rule), then the lot is rejected. The decision rule is based on the desired production standards and a statistically determined sample size. This methodology was borrowed by the public health sector, which uses a small sample of 19 respondents to provide an acceptable level of error for making management decisions. (Samples larger than 19 have practically the same statistical precision as 19—they do not result in better information, and they cost more [Lemeshow & Taber 1991].) Details of the history and statistics behind the LQAS method have been discussed in various literatures.

LQAS is a lower-cost, less time-consuming sampling method than traditional random sampling, and it can be adapted to the service sector by using supervision areas (SAs) instead of production lots to identify poorly performing areas that do not reach an established benchmark. In the aggregated LQAS methodology this survey used, the sampling can also provide an accurate measure of coverage or of service system quality at a more aggregate level (e.g., district or region). In this survey, existing lower-level administrative structures (subcounties) were used as SAs, and each district as a catchment area. When looked at from the district level, this approach is akin to stratified randomized sampling, and it produces a sample sufficient to assess district-level indicators. Information collected by using LQAS correctly can therefore yield a degree of precision in results that are at or above 92 percent confidence level (Valadez et al. 2003). Aggregation of districts across our study area, to the region or to intervention and control groups, also provides improved power. A minimum of five SAs per district were required to obtain an acceptable confidence level in the LQAS survey.<sup>1</sup> SAs were derived with respect to population size and the geographical location/neighborliness of different subcounties. Weighting with respect to population size was used to derive SAs for districts with more than five subcounties. The higher the population of a given subcounty, the more likely it would be selected as a stand-alone SA. At the same time, if two or more subcounties within the same district were geographical neighbors and had a lower combined population than another subcounty in the same district, they would then form an SA. The overall district results for survey indicators will be used by program implementers in the future as a benchmark against which to assess SA performance as either below or above the desired performance. This methodology allows poorly performing areas to be identified as priorities for improved or enhanced interventions.

### 2.2 QUESTIONNAIRE PREPARATION

The questionnaire for this survey included modules on IYCF practices (WHO 2011); exposure to nutrition behavior change messages; maternal and child health; malaria management;

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<sup>1</sup>However, Rubirizi and Buhweju districts did not have more than four subcounties (supervision areas). Therefore the sample size in each of their supervision areas was increased to 24 villages where 24 respondents were obtained per target group.

immunization; HIV and AIDS knowledge, practices, perceptions, care, and support; and water and sanitation. Answers to questions about fortification of foods were verified by interviewers when food packaging was available. All modules used during this survey, except those on IYCF practices and nutrition messaging, were adopted from the STAR-EC annual LQAS surveys, which contain standard questions based on the new generation indicators developed by USAID and the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), as well as on WHO, Uganda Ministry of Health (MOH), and Uganda AIDS Commission (UAC) indicators. Special attention was given to making sure that the indicators were useful for comparison with routinely collected service data. Survey questions were structured according to the standard questions used nationally and internationally to measure chosen indicators. Questionnaires were pretested in the field and revised accordingly.

A total of three survey questionnaires were developed, for the following three target groups: (1) biological mothers with children less than 11 months of age;<sup>2</sup> (2) biological mothers with children 12–23 months of age;<sup>3</sup> and (3) men aged 15–54 years.<sup>4</sup>

As presented in footnotes 2–4, most modules/questions were common across different target groups to ensure comparability and increase the sample size available for certain indicators. In addition, each individual questionnaire contained questions about socio-demographic and household characteristics (including location). By arranging questionnaires so that all respondents from the three target groups were asked the same questions, the sample size derived from all shared modules/questions was increased to 285 per district instead of 95, thus increasing the degree of

## HOUSEHOLD SURVEY GENERAL INFORMATION

**1,716** respondents aged 15–54 years were interviewed, each from a different household.

**572** villages were randomly sampled.

**33.3%** were males aged 15–54 years.

**66.7%** were females aged 15–49 years.\*

A total of 855 respondents from intervention districts, and 861 respondents from control districts, were interviewed.

\*All females interviewed were biological mothers of children 0–23 months old.

<sup>2</sup>The biological mothers with children 0–11 months questionnaire included the following modules: the WHO 2010 “*indicators for assessing infant and young child feeding practices—part 2 measurement*”; a behavioral change communication module on nutrition; maternal and child health; malaria management; HIV/AIDS knowledge, practices, and perceptions module as well as one on water and sanitation. It is worth noting that many of these indicators collected are standard Feed the Future indicators, used by USAID and USAID Implementing Partners.

<sup>3</sup>The biological mothers 12–23 months questionnaire included all the 0–11 months target group modules plus the immunization module.

<sup>4</sup>The men 15–54 years questionnaire included the following modules: a behavioral change communication module on nutrition HIV and AIDS knowledge, practices, and perceptions; a module on water and sanitation within the household, and a module on the household's experiences with care and support of sick people in the home.

precision in measuring such indicators at the aggregate level. Overall, the sample size for all three target groups in all six districts examined in this survey was 1,716 individuals.

Extensive pretesting of survey questions took place at the village level prior to the training of research assistants. Edits and various adjustments were made to improve data collection tools before the final questionnaires were printed. Revisions were also made after training of the research assistants, who provided suggestions and comments.

## **2.3 TRAINING/RETRAINING**

Training exercises were conducted for two different groups of research assistants. The first group was trained May 10–12, 2013, and included data collectors for Mayuge and Namutumba districts (in the EC region), while the second group trained May 14–17, 2013, and included data collectors for Buhweju, Kisoro, Ntungamo, and Rubirizi districts (in the SW region). In the EC region, data collectors were from the District Departments of Health and Community Development, and the majority had taken part in the previous STAR-EC LQAS annual activities, including the 2013 survey. In the SW region, research assistants with past survey experience were used. There were seven research assistants for each EC region district and eight for each SW region district.

The training covered the following topics: introduction to surveys and LQAS methodology, field preparation, sampling and selection of households, selection of respondents, pretesting, interviewing techniques, and logistics of data collection. The training was participatory, with practical sessions where the interviewers demonstrated knowledge of household selection within a miniature mock village. During the session on interviewing techniques, tips were provided to on how to contact a household in a village, explain the purpose of the study, gain cooperation, enumerate household members, select the respondent, ask questions in the required manner, put the respondent at ease, and accurately record the respondent's answers and any other required information. Role-play and mock interview training techniques were employed where applicable.

During the training, a day was dedicated to training interviewers on the questionnaires that were eventually used to collect data. A total of three questionnaire categories were reviewed (see section 2.2). During both training workshops, questions were translated into three local languages: Lusoga, Runyankore, and Rufumbira (covering the various languages spoken in the different districts involved in this study). As previously mentioned, a pretest of these questionnaires was conducted and its results were reviewed overnight by survey supervisors. The following day the results were discussed together with the field interviewer teams. Lastly, baseline and end-of-training evaluation exercises were conducted as a means of establishing training participants' knowledge and recall levels.

## **2.4 VILLAGE AND HOUSEHOLD SAMPLING**

As described in section 2.1, SA boundaries were formulated with respect to population size and geographical location of different subcounties within each district. Sampling was executed with each district considered as an independent catchment area and divided into four or five SAs. A two-stage sampling plan first randomly selected 19 villages (for districts with five SAs) or 24 villages (for districts with four SAs) within each SA by proportionate to size sampling. Sampling proportionate to size is a technique for surveys or mini-surveys in which the probability of

selecting a sampling unit (e.g., village, camp) is proportional to the size of its population. It is most useful when the sampling units vary considerably in size because it ensures that units in larger sites have the same probability of getting into the sample as those in smaller sites, and vice versa.

The second stage of the sampling plan was to randomly select a household within each village. This step involved using the village local council household listings or register, which is periodically updated when in- or out-migration and movement within the village takes place. This is the most up-to-date household list, and in cases where one was not available, the interviewer compiled a list together with the village leader(s) based on a village map. Interview locations for the household survey were therefore selected using the updated household listings obtained from local authorities. More information on sample size can be found in section 2.2. Each of the six survey districts were divided into SAs as listed in Table 2.

**Table 2. District Supervision Areas**

REGION	DISTRICT	TYPE OF DISTRICT	SUPERVISION AREAS (COUNTIES OR SUBCOUNTIES)
SOUTHWEST	Buhweju	Control	Bihanga; Burere; Karungu; and Rwengwe—4 SAs; each one is a subcounty.
	Kisoro	Intervention	Kisoro A (Busanza, Nyarubuye, Nyabwishenya); Kisoro B (Bukimbiri, Nyundo, Kirundo); Kisoro C (Muramba, Nyarusiza); Kisoro D (Chahi, Kisoro TC, Nyakinama); and Kisoro E (Kanaba, Murora, Nyakabande)—5 SAs, each composed of subcounties.
	Ntungamo	Intervention	Rushenyi County; Ruhaama and Rwekinihiro subcounties; Nyakyera and Rukoni subcounties; Itojo, Ntungamo, and Ntungamo T.C subcounties; and Kajara County—5 SAs (counties and subcounties).
	Rubirizi	Control	Katerera; Katunguru; Kichwamba; and Ryeru—4 SAs; each one is a subcounty.
EAST CENTRAL	Mayuge	Control	Bunya A (Baitambogwe, Wairasa, Imanyiro); Bunya B (Bukatube, Mayuge TC, Mpungwe); Bunya C (Buwaaya, Bukabooli, Kigandalo); Bunya D (Kityerera, Busakira); and Bunya E (Malongo, Malongo Islands)—5 SAs, each composed of subcounties.
	Namutumba	Intervention	Bulange; Ivukula; Kibaale and Nsinze; Magada; and Namutumba—5 SAs, each composed of subcounties.

Note: Some districts had four SAs; the sample size used per SA in these cases was 24 households from 24 villages per SA.

## 2.5 QUALITY ASSURANCE AND CONTROL

Quality assurance was an integral component of the entire survey process, which included appropriate preparation and orientation of research assistants to ensure sufficient training and familiarity with the survey processes and the different questionnaires; provision of adequate

support and supervision by a team of supervisors<sup>5</sup> at every stage of the survey with an emphasis on quality data collection; and regular and prompt feedback and reporting to each responsible survey line manager or consultant in each district by the data collectors.

At each survey stage, instant field problem solving as well as constant field editing was exercised by the participants themselves in each district. Fully edited questionnaires were given to each district supervisor. Cleaning of collected data took place at both the data entry and data analysis levels.



Data collection supervisor on the way to a village for data collection (photos credit: Alexis D'Agostino, SPRING).

## 2.6 ETHICAL CONSIDERATIONS

### 2.6.1 INFORMED CONSENT

In this survey, every respondent had the right to refuse the interview or refuse to answer specific survey questions. Interviewers respected this right and obtained verbal informed consent before conducting the interview. Cases of lack of consent were almost nonexistent and had a negligible effect on the data collected. Most of the intended and randomly selected respondents agreed to be interviewed the very first time they were approached by an interviewer.

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<sup>5</sup>The team of supervisors consisted of seven personnel (one of them provided the overall technical oversight and support supervision and six district-specific consultants extended technical assistance to district participants during the execution of this methodology in each district).

## 2.6.2 PRIVACY

It is important that each survey interview be conducted in a manner that is comfortable for the respondent and allows the respondent to speak openly and honestly. Therefore, all interviews were conducted in a private area in respondents' homes. During the interviews, no adult man, woman, or older child other than the respondent was present or able to hear the interview. Babies and younger children were allowed to be present during the interview in some instances. If a respondent indicated that she or he was uncomfortable holding the interview at home, the interview was done at another location of the respondent's preference.

## 2.7 DATA SOURCES AND ANALYSIS

Households were the lowest units from which respondents to this household-based LQAS survey were obtained. Data analysis focused on assessing coverage levels for the different program indicators, and comparisons between districts. To a large extent, proportions were computed to determine the status of each indicator, and statistical tests (z-test, chi-square, and Fisher's exact) were applied to assess whether the resultant differences between intervention and control districts were significant at the 5 percent level. Disaggregation by district, respondent's age and sex, and other key variables were done to understand the possible factors behind the variations. Data were entered using the EpiData software, and Stata (Version 12) statistical software was used to compute proportions and significance levels. Lastly, all data were analyzed with respect to nationally and internationally recommended indicator definitions and measurement guidelines. Unless otherwise noted, all analysis in this report used indicator measurements and definitions from WHO's 2010 guidance document *Indicators for Assessing Infant and Young Child Feeding Practices*.

## 3.0 RESULTS

### 3.1 SOCIAL DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Overall, six districts (four from SW Uganda and two from EC Uganda) took part in this survey. More details on the list of districts and their respective supervision areas/subcounties involved in this survey can be found in Table 2. In addition, Table 3 shows the type of respondents interviewed for this survey and their different social demographic characteristics.

**Table 3. Demographic Characteristics of Survey Population**

CHARACTERISTIC	CATEGORY	SURVEY SAMPLE	PERCENTAGE
<b>Sex of respondents</b>	Male	571	33.3
	Female	1,145	66.7
<b>Age group (years)</b>	15–24	511	29.8
	25–34	735	42.8
	35–44	352	20.5
	45–54	118	6.9
<b>Age group (months) based on IYCF recommended disaggregation for children under 2 years</b>	0–5	298	26.1
	6–8	143	12.5
	9–11	131	11.5
	12–15	219	19.1
	16–19	204	17.8
<b>Biological mothers of children 0–23 months interviewed</b>	20–23	149	13.0
<b>Education Status (highest level of education attained)</b>	No school education	156	9.1
	Primary 1–4	329	19.2
	Primary 5–7	777	45.3
	Secondary	361	21.0
	Tertiary	83	4.8
	Missing responses	10	0.6

<b>Marital status</b>	Single, no partner	69	4.0
	Single, regular partner	40	2.3
	Single, non-regular partner	17	1.0
	Married/Cohabiting	1,538	89.6
	Divorced/Separated	32	1.9
	Widowed	13	0.8
	Others/missing responses	7	0.4
<b>District of residence</b>	Buhweju	288	16.8
	Kisoro	285	16.6
	Ntungamo	285	16.6
	Rubirizi	288	16.8
	Mayuge	285	16.6
	Namutumba	285	16.6
<b>Households with functional toilet</b>	All districts	1,580	93.6
<b>Households that own radio or TV</b>	All districts	1,214	71.5

## 3.2 CORE IYCF INDICATORS

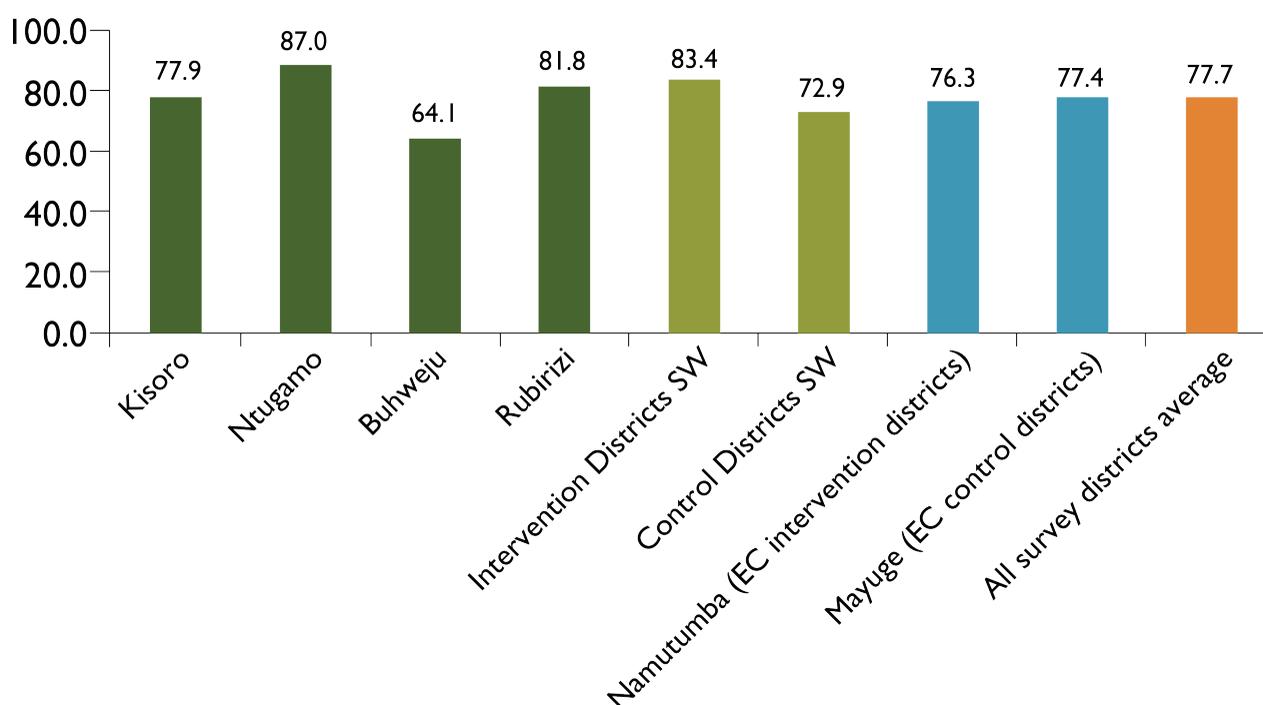
### 3.2.1 EARLY INITIATION OF BREASTFEEDING

Early initiation of breastfeeding refers to feeding of newly born children within one hour of birth with breastmilk. This practice helps babies to receive colostrum from their mother. Breastfeeding has many health benefits for both the mother and infant. To reduce infant mortality and ill health, WHO recommends that mothers breastfeed their infants within one hour of birth, continue breastfeeding exclusively for the first six months, and start complementing breastmilk with other foods from six months to at least 24 months. In many parts of the world, the rates of early initiation of breastfeeding are extremely low. Therefore, as part of this study biological mothers of children less than 24 months were asked about the time when they first breastfed their children after birth.

Overall, 77.7 percent ( $n = 1,144$ ) of mothers in all intervention and control districts reported having their newly born children breastfeeding within one hour of birth. Further comparisons show significant differences ( $p = 0.007$ ) among intervention and control districts at 81.1 percent ( $n = 570$ ) and 74.4 percent ( $n = 574$ ) respectively. Within the SW region, there were further significant differences in coverage ( $p < 0.001$ ) between intervention (83.4 percent) and control districts (72.9 percent) while there were no significant differences ( $p = 0.808$ ) in the EC region

when Namutumba (an intervention district) was compared to Mayuge (a control district). Specific details can be found in Figure 2. Among the different biological mothers' groups in all the six assessed districts, 76.4 percent ( $n = 572$ ) of those with children aged 0–11 months compared to 79.0% ( $n = 572$ ) with children 12–23 months old ( $p = 0.287$ ) reported having their newly born children breastfeeding within one hour of birth.

**Figure 2. Proportion of Biological Mothers of Children Less than 24 Months who Reported Breastfeeding Their Child Within One Hour of Birth**

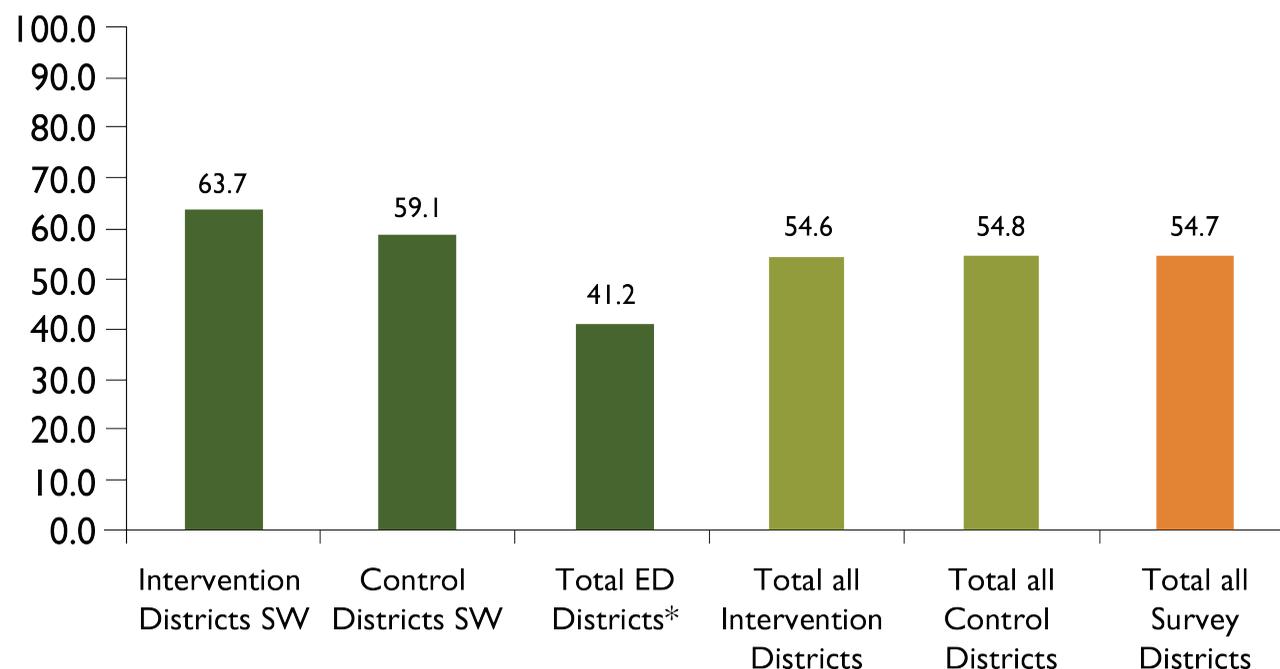


Survey results further show that there were significant differences ( $p = 0.033$ ) between women delivering/not delivering in health facilities and breastfeeding within one hour of birth. Overall, in all the six survey districts, 79.4 percent ( $n = 828$ ) of the women who reported having given birth to their children from a health facility had at the same time breastfed them within one hour of birth while 73.4 percent ( $n = 316$ ) was the finding among those who had not given birth from a health facility.

### 3.2.2 EXCLUSIVE BREASTFEEDING UNDER SIX MONTHS

For the first six months of life, an infant should receive only breastmilk without any other liquid or solid foods. Even water is not acceptable, however, drops or syrups consisting of vitamins, mineral supplements, or medicines are allowed. The survey investigated this practice among biological mothers of children 0–5 months old and found that 54.7 percent ( $n = 298$ ) had exclusively breastfed their children the previous day in all survey districts combined. Among the SPRING intervention districts, 54.6 percent ( $n = 130$ ) were reported while 54.8 percent ( $n = 168$ ) was the result from all control districts combined ( $p > 0.050$ ). Further details can be found in Figure 3.

**Figure 3. Proportion of Infants Aged Zero to Five Months Who Were Exclusively Breastfed the Previous Day**



\*EC-specific district totals could not be disaggregated further as the sample size would become too small.

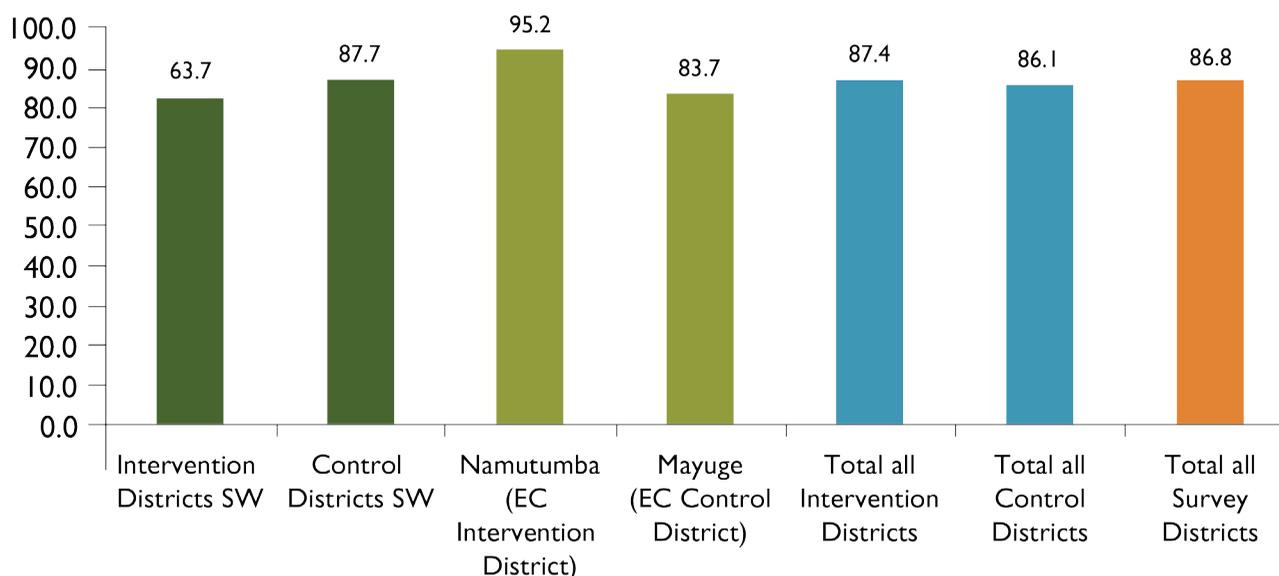
### 3.2.3 CONTINUED BREASTFEEDING AT ONE YEAR

From six months onward, all babies need complementary foods because breastmilk is no longer sufficient by itself to meet the increasing caloric and other nutritional needs of the child. Breastmilk is an important source of energy with high-quality nutrients; therefore it is expected to be continued by the mother until the child is two years old.<sup>6</sup> According to available research, breastmilk can provide about 75 percent of the vitamin A that a child needs, provided the mother is not deficient in vitamin A herself. In addition, some studies have proved that breastfeeding beyond one year would not only give further protection and immune support to the baby but also reduce the chances of women acquiring breast cancer. As part of the investigations for this survey, biological mothers of children were asked about continued breastfeeding at one year.

As shown in Figure 4, overall, 86.8 percent ( $n = 219$ ) of children 12–15 months of age were reported to be breastfed milk the day prior to this survey. There were no major differences when comparing control and intervention districts ( $p = 0.781$ ). Further analysis at a district-specific level could not be possible as the sample size would become much lower.

<sup>6</sup>It is important to note that for HIV-positive women, it is only recommended to continue breastfeeding through one year of age (WHO 2013). In this survey, respondents were not asked about their HIV status, but it is conceivable that some of the women interviewed were HIV positive and should only breastfeed their children up to one year of age.

**Figure 4. Proportion of Children 12–15 Months whose Mothers Reported Feeding Them with Breastmilk the Day Prior to the Survey**



Note: Results on most of this disaggregation are proxies and involve low sample size.

### 3.2.4 INTRODUCTION OF SOLID, SEMI-SOLID, OR SOFT FOODS

As explained in section 3.2.3, at six months of age, a child is expected to start receiving solid (or semi-solid) food in addition to breastmilk or a breastmilk substitute. Overall, 83.9 percent ( $n = 143$ ) of infants 6–8 months of age were reported having received solid, semi-solid, or soft foods a day prior to this survey within the SPRING program intervention districts. When compared to the non-program districts of Buhweju, Rubirizi, and Mayuge whose results were at 91.8 percent, the overall intervention districts coverage was less at 78.1 percent. More specific details can be found in Appendix 1.

### 3.2.5 MINIMUM DIETARY DIVERSITY

As part of investigations among children who receive the minimum dietary diversity, 49.3 percent ( $n = 846$ ) children aged 6–23 months of age were reported to have received foods from four or more food groups. There were significant differences ( $p = 0.041$ ) between intervention (45.9 percent,  $n = 440$ ) and control (53.0 percent,  $n = 406$ ) districts. Among intervention districts, both SW districts had lower results (43.2 percent and 43.3 percent for Kisoro and Ntungamo respectively) when compared to Namutumba District (51.0 percent) in the EC region. At the same time, fewer children aged 6–11 months received foods from four or more food groups than did older children. More details can be found in Table 4.

Most biological mothers in the intervention districts (29.6 percent,  $n = 130$  and 25.0 percent,  $n = 110$ ) reported that their children aged 6–23 months had received WHO-recommended food groups 3 and 4 (respectively) the day prior to the survey. The least consumed foods were in groups 7 (1.8 percent) and 1 (4.3 percent). Figure 5 illustrates the most common WHO-recommended food group types among both intervention and control districts. It is important to note that the findings in this graph do not match the results from the most recent Demographic Household Survey conducted in Uganda. Compared to the DHS results, this survey found much lower

rates of grains, vitamin A-rich foods, and fruits and vegetables, as well as slightly higher rates of legume/nut and egg consumption. The cause of these differences requires further investigation.

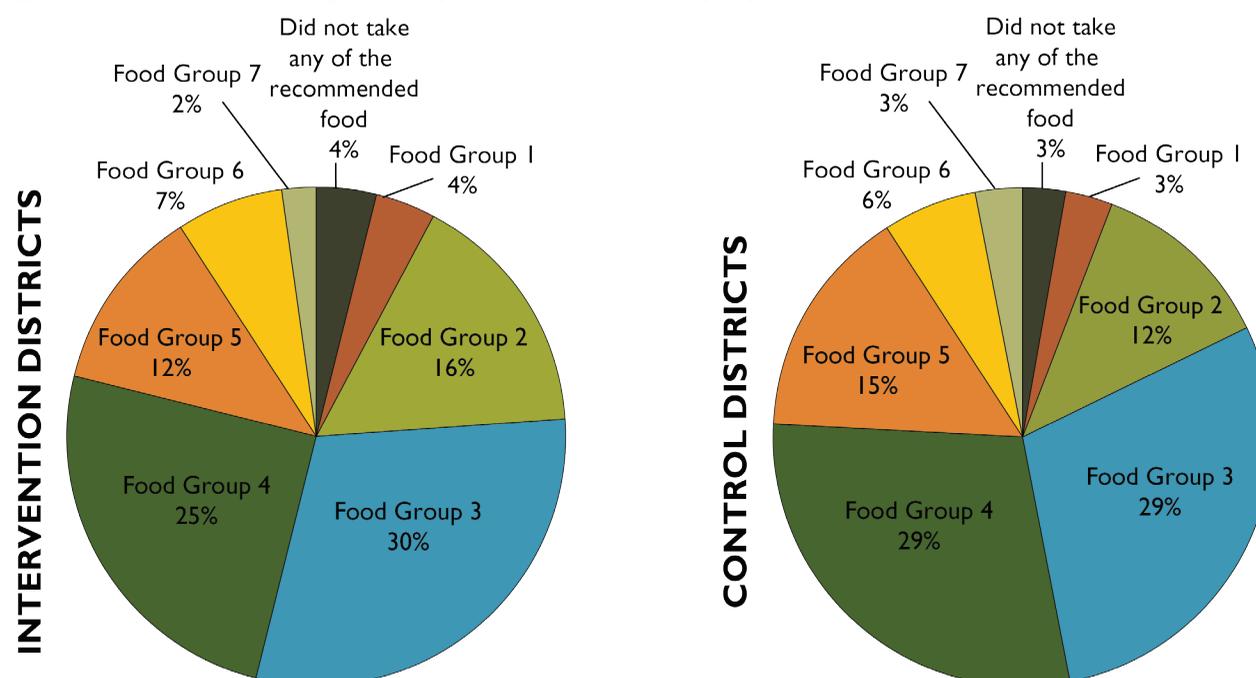
**Table 4. Proportion of Children 6–23 Months Whose Mothers Reported Providing Four or More Food Groups the Day Prior to the Survey**

DISAGGREGATION	SOUTHWEST DISTRICTS							EAST CENTRAL DISTRICTS				
	Intervention Districts			Control Districts			Total South-west Districts	P-value (intervention vs. control) or age comparisons	Inter-vention District	Control District	Total East Central Districts	P-value (intervention vs. control) or age comparisons
	Kisoro	Ntugamo	Total	Buhweju	Rubirizi	Total			Namutumba	Mayuge		
<b>Total</b>	43.2	43.3	43.3	53.6	52.9	53.3	48.1	$p = 0.017$	51.0	52.3	51.6	$p = 0.830$
<b>6–11 months</b>	◇	◇		◇	◇		36.5	$p = 0.001$	◇	◇	41.9†	
<b>12–17 months</b>	◇	◇		◇	◇		52.9		◇	◇	54.8	$p = 0.063$
<b>18–23 months</b>	◇	◇		◇	◇		54.5		◇	◇	59.4†	

◇: Sample size is too low for results to be disaggregated.

†Sample size is low, but results can be used as a proxy.

**Figure 5. The Most Common WHO-Recommended Food Group Types Consumed by Children Aged 6–23 Months During the Day Prior to the Survey, by Intervention and Control Districts**



**Table 5. WHO-Recommended Food Group Classification**

<b>Food Group 1</b>	Thin porridge & (Porridge, bread, chapati, posho, rice, bushera tea, or other foods made from grains) & (White/Irish potatoes, white yams, manioc, cassava, or any other foods made from roots)
<b>Food Group 2</b>	Any foods made from beans, peas, lentils, nuts, or seeds
<b>Food Group 3</b>	(Milk such as tinned, powdered, or fresh animal milk) & (Infant formula such as NAN, LACTOGEN, SMA GOLD, COW&GET) & (Yogurt or bongo) & (Cheese, yogurt, or other milk products)
<b>Food Group 4</b>	(Liver, kidney, heart, or other organ meats) & (Any meat, such as beef, pork, lamb, goat, chicken, or duck) & (Fresh or dried fish, shellfish, or seafood)
<b>Food Group 5</b>	Eggs
<b>Food Group 6</b>	(Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside) & (Any dark green leafy vegetables) & (Ripe mangoes or ripe papayas)
<b>Food Group 7</b>	Any other fruits or vegetables

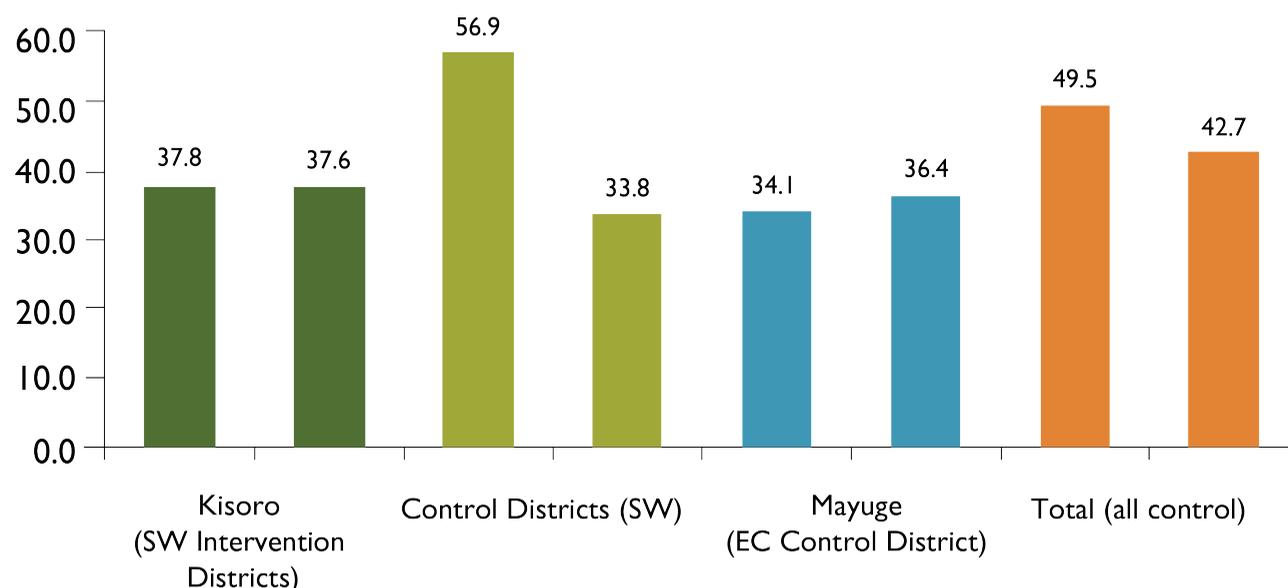
### 3.2.6 MINIMUM MEAL FREQUENCY

According to WHO, minimum meal frequency is defined as the proportion of breastfed and non-breastfed children 6–23.9 months of age who receive solid, semisolid, or soft foods or milk feeds the minimum number of times or more. Minimum meal frequency includes:

- Two times for breastfed infants 6–8 months
- Three times for breastfed children 9–23 months
- Four times for non-breastfed children 6–23 months

Overall 42.7 percent ( $n = 846$ ) of breastfed and non-breastfed children aged 6–23 months of age received solid, semisolid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more. Figure 6 details findings by control/intervention district and age group.

**Figure 6. Proportion of Children 6–23 Months Whose Mothers Reported Feeding Them Solid, Semi-Solid, or Soft Foods\* the Day Prior to the Survey**



### 3.2.7 MINIMUM ACCEPTABLE DIET

This composite indicator is calculated from the proportion of breastfed children aged 6–23 months who had at least the minimum dietary diversity and the minimum meal frequency during the previous day and the proportion of non-breastfed children aged 6–23 months who received at least two milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day. A minimum acceptable diet is essential to ensure appropriate growth and development of infants and young children. Without adequate diversity and meal frequency, infants and young children are vulnerable to malnutrition, especially stunting and micronutrient deficiencies, and to increased morbidity and mortality.

The proportion of children 6–23 months who received a minimum acceptable diet (apart from breastmilk) from Namutumba District in EC Uganda was 21.2 percent ( $n = 151$ ) compared to 17.0 percent ( $n = 289$ ) from the SW region intervention districts of Kisoro and Ntungamo. Additionally, when comparing districts within the SW region, results showed that more children had received a minimum acceptable diet in control districts (24.5 percent,  $n = 274$ ) than in intervention districts (17.0 percent,  $n = 289$ ). In the EC region, differences also existed between intervention (21.2 percent,  $n = 151$ ) and control districts (17.4 percent,  $n = 132$ ).

### 3.2.8 CONSUMPTION OF IRON-RICH<sup>7</sup> OR IRON-FORTIFIED<sup>8</sup> FOODS

Iron-rich foods include any food items containing relatively large amounts of iron. Such examples include liver, kidney, heart, lean meat, or other organ meats. Among the best plant sources include leafy green vegetables, whole grains, and legumes. Fortified foods are defined as foods that have certain nutrients added to improve their nutrient content, as reported by mothers during the interviews and verified by interviewers when possible. Children 6–23 months were assessed for such a diet.

Overall, results from all study districts show that 33.1 percent ( $n = 846$ ) of children 6–23 months of age were reported to have received an iron-rich or iron-fortified food that is specially designed for infants and young children. Table 6 illustrates disaggregation by control/intervention districts and age group.

**Table 6. Proportion of Children 6–23 Months who Received an Iron-Rich or Iron-Fortified Food**

CHARACTERISTICS	CHILDREN 6–23 MONTHS		TOTAL
	INTERVENTION DISTRICTS	CONTROL DISTRICTS	
<b>SOUTHWEST REGION</b>			
<b>Age</b>			
6–11 months	11.1	37.8	23.2
12–17 months	20.8	37.9	29.3
18–23 months	20.2	48.5	34.6
<b>Age Total</b>	<b>17.3</b>	<b>41.6</b>	<b>29.1</b>

<sup>7</sup>Iron-rich foods investigated as part of this survey include the WHO recommended food groups that include: liver, kidney, heart or other organ meats; any meat such as beef, pork, lamb, goat, chicken, or duck; fresh or dried fish, shellfish or seafood.

<sup>8</sup>Iron-fortified foods investigated during the survey include any foods to which iron-fortified powder or sprinkles were added.

Intervention Districts			
Kisoro	18.2	N/A	18.2
Ntungamo	16.3	N/A	16.3
<b>District Total</b>	<b>17.3</b>	<b>N/A</b>	<b>17.3</b>
Control Districts			
Buhweju	N/A	23.9	23.9
Rubirizi	N/A	59.6	59.6
<b>District Total</b>	<b>N/A</b>	<b>41.6</b>	<b>41.6</b>
EAST CENTRAL REGION			
Age			
6–11 months	33.9	43.2	37.6
12–17 months	37.3	52.2	45.2
18–23 months	33.3	42.9	37.5
<b>Age Total</b>	<b>35.1</b>	<b>47.7</b>	<b>41.0</b>
District			
Mayuge	N/A	47.7	47.7
Namutumba	35.1	N/A	35.1
<b>District Total</b>	<b>35.1</b>	<b>47.7</b>	<b>41.0</b>
<b>GRAND TOTAL</b>	<b>23.4</b>	<b>43.6</b>	<b>33.1</b>

### 3.3 OPTIONAL IYCF INDICATORS

Among the optional IYCF indicators assessed during this study include those on: children ever breastfeeding; continued breastfeeding at two years; age-appropriate breastfeeding; predominant breastfeeding under six months; bottle feeding and milk feeding frequency.

#### 3.3.1 CHILDREN EVER BREASTFED

Overall, results from all the six districts show that 95.1 percent ( $n = 1,134$ ) children aged 0–23 months had ever been breastfed since they were born. Among intervention districts, Kisoro had the highest result (98.4 percent,  $n = 190$ ) while the lowest was reported from Namutumba District at 95.8 percent ( $n = 190$ ). Comparisons between intervention (97.2 percent,  $n = 566$ ) and control (93.0 percent,  $n = 568$ ) districts show significant differences in coverage ( $p = 0.004$ ) with the former having more coverage.

Among the SW region districts, there were no significant differences in coverage ( $p = 0.377$ ) between control (97.9%) and intervention districts (96.9 percent) while in the EC region, there were significant differences ( $p = 0.002$ ) between Namutumba (an intervention district at 95.8 percent) and Mayuge (a control district at 85.0 percent).

In the SW and EC intervention districts, **96.9%** and **95.8%** respectively of children 0–23 months have ever been breastfed since they were born.

### 3.3.2 CONTINUED BREASTFEEDING AT TWO YEARS

Mothers were asked if they were still breastfeeding their children aged 20–23 months.<sup>9</sup> Overall, less than half (46.3 percent,  $n = 149$ ) of these mothers were still breastfeeding their children. Control districts (48.5 percent) had slightly but not significant ( $p = 0.635$ ) coverage as compared to intervention districts (44.6 percent). In the SW region, a higher proportion of mothers from control districts (49.1 percent) reported breastfeeding their children than mothers in intervention districts (43.8 percent,  $p = 0.567$ ). Findings from the EC region were similar. Further subgroup analysis of this indicator is not possible as the sample size from which to draw such comparisons becomes too low for significant comparisons to be made. Such results can only be used as a proxy and are found in Appendix 1 of this report.

### 3.3.3 AGE-APPROPRIATE BREASTFEEDING

In the *Indicators for Assessing Infant and Young Child Feeding Practices Handbook*, WHO defines “age-appropriate breastfeeding” as a summary measure of the proportion of children less than two years of age who are appropriately breastfed and who receive complementary foods when needed (2010). The sample universe for this indicator is children 0–23 months of age living with their mothers. This indicator captures information about exclusive breastfeeding for children 0–5 months; and about the dual practice of breastfeeding and complementary feeding for children 6–23 months.

Mothers in SW control districts reported slightly higher proportions of appropriate breastfeeding (72.4 percent,  $n = 384$ ) than intervention districts compared to 70.3 percent ( $n = 380$ ). While there were not many differences in coverage in the SW region, there were large differences in coverage ( $p < 0.001$ ) in the EC region. A total of 86.8 percent ( $n = 190$ ) mothers in Mayuge (control district) reported their children receiving appropriate breastfeeding, compared to 71.6 percent ( $n = 190$ ) in Namutumba (intervention district). When comparing results across all SPRING intervention districts, findings show that Ntungamo District had the lowest result (66.8 percent,  $n = 190$ ) while the highest was reported from Kisoro District at 73.7 percent ( $n = 190$ ).

### 3.3.4 PREDOMINANT BREASTFEEDING UNDER SIX MONTHS

As pointed out by the WHO’s guidelines (2010), although previous studies did not find any significant effect on mortality between exclusive and predominant breastfeeding, there are other reasons to

<sup>9</sup>As described earlier, mothers who are HIV-positive are discouraged from continuing breastfeeding past one year of age. While the survey did not assess HIV status, it is possible that some of the women interviewed are HIV-positive and should not be continuing to breastfeed children over one year of age.

recommend exclusive breastfeeding as the preferred option when compared to predominant feeding for children under six months of age. The same WHO report details that predominant breastfeeding has been associated with an increased risk of diarrhea. Avoidance of any liquids other than breastmilk is key to ensuring appropriate feeding of infants less than six months of age, unless there is a medical reason to do otherwise. Predominant breastfeeding does allow children under six months to consume oral rehydration salts, vitamin and/or mineral supplements, ritual fluids, water and water-based drinks, and fruit juice. Other liquids, including non-human milks and food-based fluids, are not allowed, and no semi-solid or solid foods are allowed.

A total of 65.9 percent and 63.6 percent of biological mothers with children under six months of age in the SW intervention and control districts (respectively) reported that their infants were predominantly breastfed. Though based on a low sample size of 97 respondents, findings showed that Namutumba (64.1 percent) an intervention district in the EC region had a higher proportion of children predominantly breastfed when compared to the control district of Mayuge ( 51.7 percent).

### 3.3.4 BOTTLE FEEDING

Bottle feeding is the practice of feeding an infant or any young child from a bottle that contains a nipple or rubber at its tip and is normally used in substitution for and/or as a supplement to breastfeeding. This practice is steadily increasing in Uganda. Though not significant ( $p = 0.329$ ), findings among the SW intervention districts show that the use of bottle feeding increases with age and is highest in children 12–23 months. Table 7 summarizes findings on bottle feeding as a practice in SW and EC Uganda.

**Table 7. Proportion of Children 0–23 Months of Age Who Are Fed With a Bottle**

DISAGGREGATION (YEARS)	SOUTHWEST DISTRICTS							EAST CENTRAL DISTRICTS			
	Intervention Districts			Control Districts			Total Southwest Districts	P-value (intervention vs. control) or age comparisons	Intervention District	Control District	Total East Central Districts
	Kisoro	Ntugamo	Total	Buhweju	Rubirizi	Total			Namutumba	Mayuge	
<b>Total</b>	2.2	4.1	3.1	5.3	4.8	5.1	4.1	$p = 0.188$	3.2	6.2	4.7 (n = 365)
<b>0–5 months</b>	◇	◇	1.2	◇	◇	2.8	2.1	$p = 0.062$	◇	◇	0.0† (n = 91)
<b>6–11 months</b>	◇	◇	2.2	◇	◇	12.4	7.0		◇	◇	11.4† (n = 88)
<b>12–23 months</b>	◇	◇	4.4	◇	◇	3.2	3.8		◇	◇	3.8 (n = 186)

◇: Sample size is too low for results to be disaggregated.

†Sample size is low, but results can be used as a proxy.

### 3.3.5 MILK FEEDING FREQUENCY FOR NON-BREASTFED CHILDREN

When an assessment was conducted among non-breastfed children and whether they were feeding on milk and other milk products<sup>10</sup> plus the frequency involved, findings showed that 20.5 percent ( $n = 176$ ) of non-breastfed children 6–23 months of age received at least two milk feedings in the past 24 hours. The proportions of children receiving at least two milk feedings were slightly lower in control districts (17.6 percent,  $n = 91$ ) than in intervention districts (23.5 percent,  $n = 85$ ). However, comparisons within regions are not very reliable as the sample size from which to draw this analysis became lower. As a proxy result, it is interesting to note that 25.4 percent of non-breastfeeding children in SW intervention districts received two or more milk feedings, compared to 18.2 percent in control districts. In the EC region, findings were much lower for Namutumba (intervention district, 19.2) than Mayuge (control district, 16.7 percent) respectively.

## 3.4 ADDITIONAL NUTRITION INDICATORS

### 3.4.1 CONSUMPTION OF HOME-FORTIFIED FOODS

In order to assess the consumption of home-fortified foods by children aged 6–23 months, two questions were asked to respondents on the consumption of such foods within the last 24 hours and last six months prior to the survey. Overall, the consumption of such foods was witnessed to be very low even when measured against the last six months prior to the survey. Most district results were reported at less than 10 percent as illustrated in Table 8. Additionally, there were no significant differences between control and intervention districts from both regions.

**Table 8. Consumption of Home-Fortified Food among Children Aged 6–23 Months**

INDICATOR	SOUTHWEST DISTRICTS							EAST CENTRAL DISTRICTS				
	Intervention Districts			Control Districts			Total Southwest Districts	P-value (intervention vs. control) or age comparisons	Intervention District	Control District	Total East Central Districts	P-value (intervention vs. control) or age comparisons
	Kisoro	Ntungamo	Total	Buhweju	Rubirizi	Total			Namutumba	Mayuge		
% of biological mothers of children 6–23 months who reported that their children consumed any food to which they added a powder or sprinkles within the last 24 hours prior to the survey	3.2 ( $n=125$ )	2.2 ( $n=134$ )	2.7	2.9	0.0	1.5	2.1	$p = 0.322$	6.0 ( $n=149$ )	0.8	3.7	$p = 0.074$
% of biological mothers of children 6–23 months who reported that their children consumed any food to which they added a powder or sprinkles within the last 6 months prior to the survey	6.1 ( $n=98$ )	13.9 ( $n=130$ )	10.5	13.3	0.0	7.1	8.7	$p = 0.186$	8.2 ( $n=147$ )	5.7	7.1	$p = 0.740$

<sup>10</sup>Milk and other milk products assessed included: fresh animal, tinned, or powdered milk; infant formula such as NAN, LACTOGEN, SMA GOLD, COW & GET, and yogurt or bongo.

### 3.4.2 CONSUMPTION OF INDUSTRIALLY-FORTIFIED FOODS AT HOUSEHOLD LEVEL

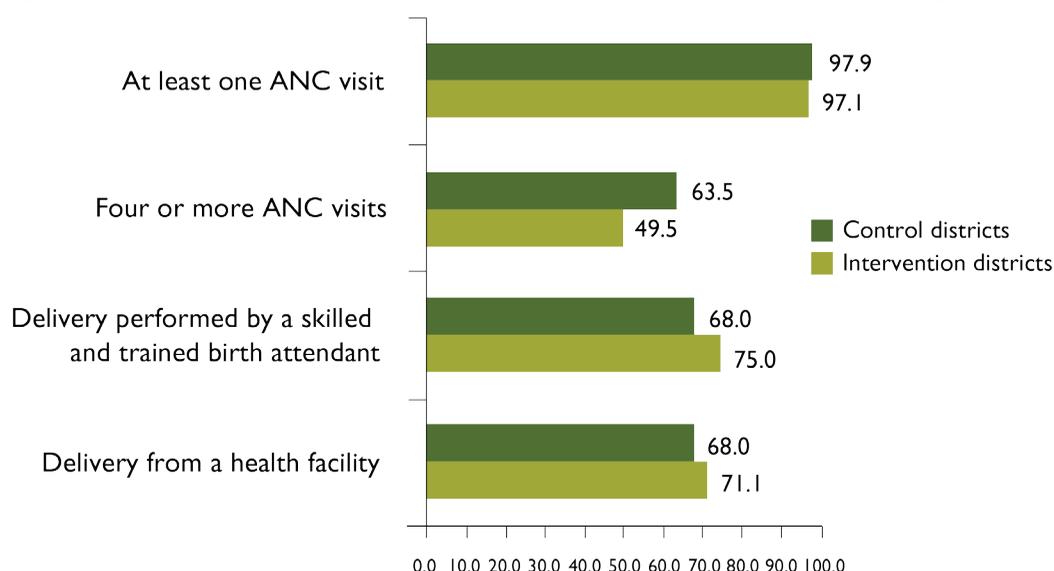
In addition to what has been presented in the previous section, respondents were asked about the consumption of certain foods by the household in the seven days prior to the survey and whether such foods were industrially fortified. These included maize flour, cooking oil, sugar, and salt. Of all the foods included, most respondents within the SW intervention districts reported that they had consumed fortified salt (69.5 percent,  $n = 380$ ) while at the same time this proportion was found to be highest in Namutumba (an intervention district in the EC region) at 73.7 percent ( $n = 190$ ). Use of fortified cooking oil was found to be the lowest among SW region intervention districts (17.9 percent,  $n = 380$ ) followed by fortified maize flour at 19.2 percent ( $n = 380$ ). However, when assessing both intervention and control districts, Namutumba District in the EC region was found to have the lowest proportion for the use of any fortified food (fortified maize in particular) at 2.6 percent ( $n = 190$ ). More details can be found in Appendix 1.

### 3.5 GOAL-ORIENTED ANTENATAL CARE (ANC) INDICATORS

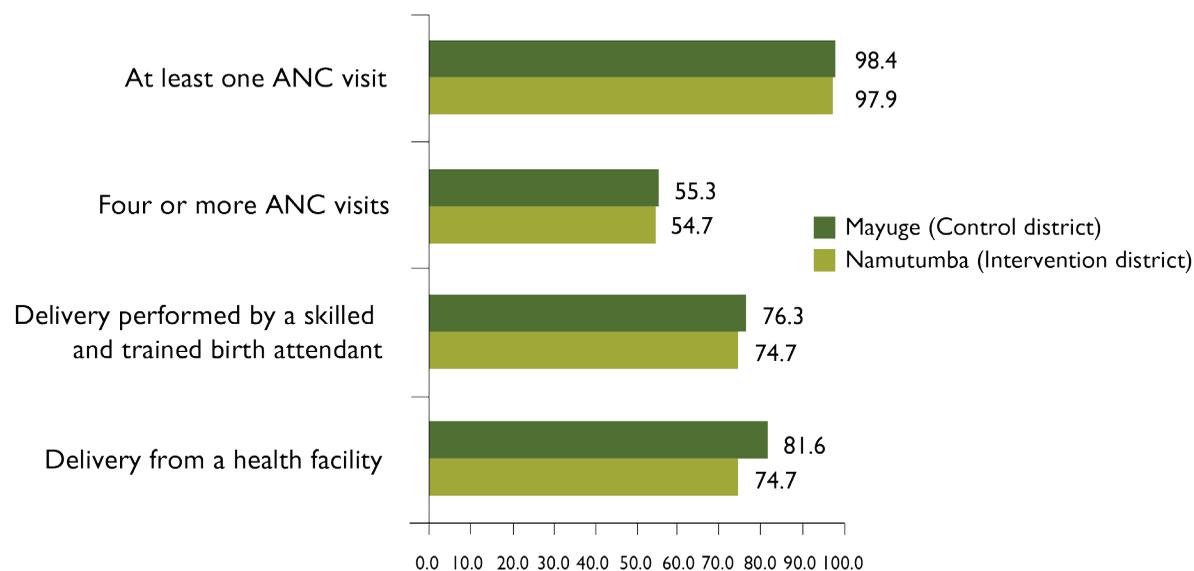
High-quality ANC counseling, improved services, and outcomes play a big role in improving nutrition outcomes among mothers and their babies. As part of this survey, biological mothers of children 0–23 months were asked questions related to goal-oriented ANC. Indicators assessed include: ANC attendance, frequency of ANC visits, use of iron and intestinal drugs during pregnancy, as well as deliveries at health facilities.

Overall, any ANC attendance (one or more visits) was reported in high proportions across all districts assessed during the study. In the SW region, proportions were reported at 97.1 percent ( $n = 380$ ) and 97.9 percent ( $n = 384$ ) among intervention and control districts respectively ( $p = 0.471$ ). Attendance at four or more ANC visits was much lower at 49.5 percent ( $n = 380$ ) and 63.5 percent ( $n = 384$ ) among intervention and control districts ( $p = 0.001$ ). Attendance at 4 or more ANC visits was slightly higher in Namutumba (54.7 percent,  $n = 190$ ) than in the SW intervention districts. There were no significant differences ( $p = 0.046$ ) between control and intervention districts in the EC region. See Figures 7 and 8 for further ANC findings.

**Figure 7. Results of Different Goal-Oriented ANC Indicators (Percentages)—SW Region Districts**



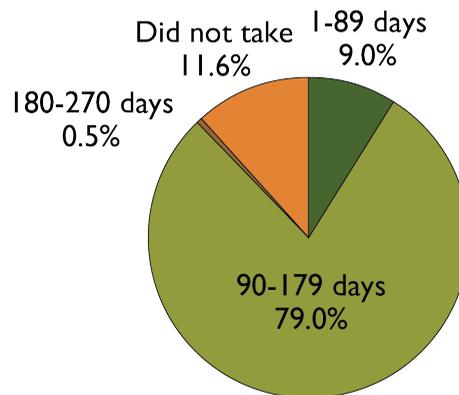
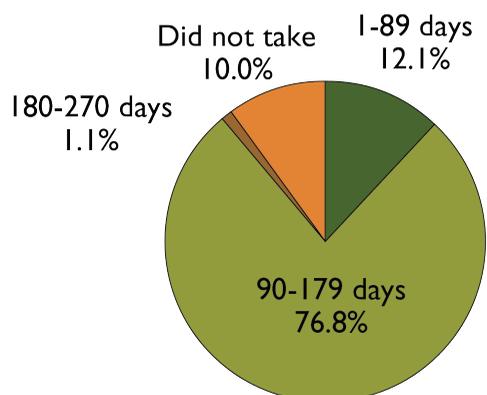
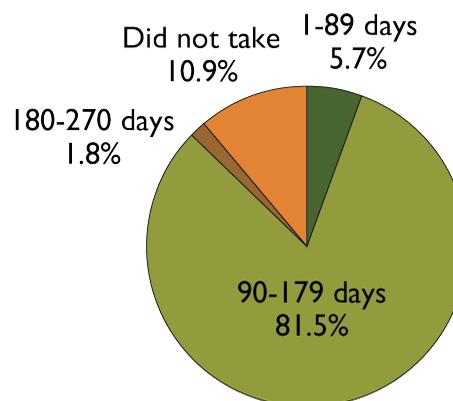
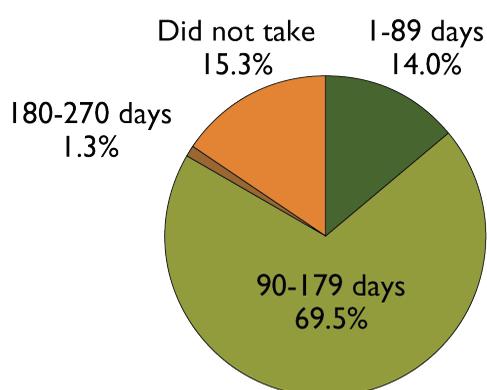
**Figure 8. Results of Different Goal-Oriented ANC Indicators (Percentages)—EC Region Districts**



**Figure 9. Proportion of Women who Reported Having Taken Iron Tablets, and the Number of Days They Took it During Their Last Pregnancy**

**SW INTERVENTION DISTRICTS**

**SW CONTROL DISTRICTS**



**NAMUTUMBA  
(EC INTERVENTION DISTRICT)**

**SMAYUGE  
(EC CONTROL DISTRICT)**

Nearly six in every 10 women (59.8 percent,  $n = 380$ ) from the SW region intervention districts reported that they had taken a drug for intestinal worms during ANC, while only half of the women in Namutumba (48.6 percent,  $n = 190$ ) reported taking the drugs. Women were also asked about consumption of iron tablets during pregnancy. Details can be found in Figure 9. Women were asked to report whether or not they had taken iron tablets during their pregnancy. Those women who indicated they had taken tablets were asked how many days they were taken for. Since most women are told to take one tablet per day, we can use these responses to approximate the number of tablets taken. This definition and measurement of the indicator is in line with similar surveys, including the UDHS.

### 3.6 MESSAGING FOR SOCIAL AND BEHAVIOR CHANGE COMMUNICATION (SBCC)

SPRING uses SBCC as a strategic intervention in the promotion of knowledge, practices, and behavior to yield positive nutrition outcomes among mothers of children 0–23 months, as well as other household members that have influence over such children.

Overall, 26.3 percent ( $n = 563$ ) and 16.7 percent ( $n = 282$ ) of all respondents from the SW and EC intervention districts, respectively, reported that their households had received at least one message about proper nutrition for women or children in the last three months prior to the survey. Interestingly, when assessing findings in all intervention districts, more males (32.5 percent,  $n = 283$ ) than females (18.3 percent,  $n = 562$ ) reported that they had received at least one message about proper nutrition for women or children in the last three months prior to the survey ( $p < 0.001$ ). Most respondents mentioned radio (52.3 percent) and health facility (42.1 percent) as the means through which they received these messages (see Table 9).

**Table 9. Format by which Nutrition Messaging was Received among Individuals Who Received at Least One Message in the Three Months Prior to the Survey**

MESSAGE FORMAT	INTERVENTION DISTRICTS						CONTROL DISTRICTS			Total All Districts (control + intervention)
	Kisoro	Namutumba	Ntugamo	Males	Females	Total	Males	Females	Total	
Health facility	56.8	38.3	26.9	29.4	53.4	42.1	32.5	68.3	56.4	50.1
Village health team	40.7	8.5	17.9	22.8	27.2	25.1	34.9	33.5	34.0	30.1
Traditional health providers (including traditional birth attendants, healers and herbalists)	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.6	1.2	0.7

<b>Family member</b>	3.7	2.1	1.5	3.3	1.9	2.6	0.0	1.2	0.8	1.6
<b>Neighbor/Friend</b>	2.5	0.0	0.0	1.1	1.0	1.0	3.6	4.8	4.4	2.9
<b>Child who attends school</b>	0.0	2.1	0.0	0.0	1.0	0.5	0.0	1.2	0.8	0.7
<b>Community gathering</b>	0.0	8.5	25.4	12.0	9.7	10.8	15.7	12.6	13.6	12.4
<b>Radio</b>	49.4	59.6	50.8	64.1	41.8	52.3	57.8	40.1	46.0	48.8
<b>Television</b>	0.0	0.0	0.0	0.0	0.0	0.0	3.1	1.20	0.4	0.2
<b>Internet</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Mobile phone messaging</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Printed materials</b>	0.0	0.0	1.5	1.1	0.0	0.5	1.2	1.2	1.2	0.9
<b>Religious institution</b>	2.5	0.0	1.5	1.1	1.9	1.5	3.6	3.6	3.6	2.7
<b>Mother-to-mother group</b>	2.5	0.0	1.5	0.0	2.9	1.5	0.0	3.6	2.4	2.0

When asked about messages on proper breastfeeding in the last three months, only 33.1 percent ( $n = 565$ ) and 26.6 percent ( $n = 282$ ) of respondents who had heard at least one message from the SW and EC intervention districts (respectively) had heard the message. Details of this and other thematic indicators can be found in Appendix 2. It is possible that the estimate presented in Table 9 and Appendix 2 could be affected by respondent's recall bias. To mitigate this possibility interviewer asked open-ended questions with minimal prompting to avoid suggesting responses to the interviewees.

### 3.7 COMPARISON BETWEEN SPRING 2013 BASELINE RESULTS AND THE UDHS 2011

A comparison between selected findings from the 2011 *Uganda Demographic Health Survey* (UDHS) and this SPRING survey was drawn and findings largely show proportions within the same range. However, it should be noted that such comparisons are complicated due to the different years in which each study was conducted. Additionally, the geographical span (six districts) covered by the SPRING survey was only six districts in SW and EC Uganda, which is difficult to compare with all districts covered by the UDHS.

**Table 10. Comparison Between the SPRING 2013 Baseline Study and UDHS 2011 Survey Findings**

<b>INDICATOR</b>	<b>SPRING 2013 BASELINE SURVEY (RESULTS FROM ALL SIX STUDY DISTRICTS)</b>	<b>UDHS 2011 (NATIONAL RESULTS)</b>
<b>Early initiation of breastfeeding</b>	77.7	53
<b>Exclusive breastfeeding under 6 months</b>	54.7	63
<b>Continued breastfeeding at one year</b>	86.8	87
<b>Introduction of solid, semi-solid, or soft foods</b>	83.9	67
<b>Consumption of iron-rich or iron-fortified foods</b>	33.1	33.7
<b>Children ever breastfed</b>	95.1	98.3
<b>Continued breastfeeding at 2 years</b>	46.3	46
<b>Age-appropriate breastfeeding</b>	69.8	67
<b>Predominant breastfeeding under 6 months</b>	62.1	73

Note: The surveys were conducted in different years and across different geographical areas.

## 4.0 CHALLENGES AND LESSONS LEARNED

### 4.1 CHALLENGES

- Due to small sample size, IYCF indicators that require a denominator of 6–8 month-, 12–15 month-, and 20–23 month-old children could only be assessed and reported as a proxy especially at district or SA levels. The degree of precision is compromised with smaller sample sizes arising from such aforementioned age categories.
- There were some selected villages whose names had changed, however, data collectors were able to eventually find the correct villages with the help of the local guides. Therefore, the objectives of the survey were not compromised.
- Some survey questions required interviewers to observe items such as fortified foods. However, some respondents would not allow interviewers to make the necessary observations. Also, interviewers were not always able to observe a respondent's ANC card. In the absence of such cards, recall failure among some respondents could not be ruled out even though interviewers tried their best to probe for responses.
- Data collection in hard-to-reach places and districts was very challenging. These districts included Buhweju and Kisoro in SW Uganda, whose terrain is often too hilly for navigation. Further, the rural road network in some parts of these districts is in a poor state characterized with huge potholes, which slowed transportation. In some areas, data collectors had to walk for miles as there was no easy navigation of roads to selected villages. In Kisoro, one of the villages in the sample was on an island in one of the local lakes, which data collectors did not know before they began. The time and cost it took to reach this island was high. Most of the interviewers expressed concern about the length of time it took to get to some of the selected villages, as well as the time taken to find the first randomly selected household in the few number of days they had to accomplish allocated interviews.



A sampled island village in Kisoro District (photo credit: Alexis D'Agostino, SPRING).

- Unpredictable weather conditions made most research assistants lose time. This survey was conducted at a time when rains were still heavy. The rainy season in Uganda has changed over time and it is not easy to get accurate forecasts from geological departments in the country.
- This research uncovered statistical differences between the SPRING and control districts for a number of key indicators. SPRING carefully chose control districts with similar levels of partner involvement as the SPRING districts, but there are variations in nutrition programming between the districts. In addition, SPRING programming, while limited (see “Lessons Learned” below), had begun before data collection for this survey. SPRING plans to conduct annual data collection on these indicators and data analysis will focus on the changes over time in indicator levels, rather than the variations in the starting points of the intervention and control districts.

## 4.2 LESSONS LEARNED

- The sample size used in this survey was sufficient for calculating most indicators at the 0–11 and 12–23 month age categories, however, it is not be enough for analysis and subgroup analysis of other interest groups (e.g., 0–5, 6–8, 12–15 and 20–23 month).
- Partnerships between USAID implementing partners on such undertakings are not only useful for promoting improved collaboration and coordination of activities but also for reducing activity costs that arise mainly from the advantages of the economies of scale. This was evident with the SPRING and STAR-EC partnership in the EC region. In addition, SPRING took Community Connector and SCORE baseline surveys into account while planning for this survey.
- During data collection, research assistants used local *boda boda* cyclists as village guides and as a transport means to various sampled villages. This served both as a quick way to reach out to sampled households and respondents as well as a cheaper means of transport than if each data collector hired a car. In districts with difficult terrain such as Kisoro, this method of transportation proved very useful.
- Building rapport with the local authorities is very important and builds confidence in the local community sharing their ideas and experiences freely.
- Due to the multiple competing priorities faced by district health authorities, the data collectors often found themselves performing district roles alongside this household survey exercise thus increasing the time taken to collect data. The hired research assistants used in the SW were more flexible and did not face the same time constraints.
- SPRING began hospital-based NACS interventions for nearly a year before the survey was conducted; however, community- and lower facility-level programming did not begin until May 2013. Given the small community reach of the hospital programming and limited nature of community programming when the baseline survey was conducted, this survey still serves as a fair assessment of the baseline situation in the intervention districts.
- These results are only quantitative and therefore cannot answer questions around why actions are or are not taking place. Further research will be needed to investigate the “why” of nutrition behaviors. These findings will be especially important in developing appropriate

SBCC strategies. In addition, the subdistrict LQAS results should help with development of context-specific messaging, as appropriate.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Support among pregnant women for goal-oriented ANC and giving birth at health facilities will help to enhance improved IYCF indicators such as breastfeeding of babies immediately after birth plus empowerment of expectant mothers with nutrition information through ANC counseling. ANC attendance and health facility deliveries increase health worker access to women during this critical time, which provides women with greater access to nutrition knowledge and information around proper nutrition habits.

SPRING needs to take advantage of integrated outreach service delivery models that are being championed by several partners in the country to increase access to nutrition services among target groups. USAID's existing partners, such as STAR-SW, STAR-EC, and others, have outreach models that mobilize large numbers of target group individuals for immunization, family planning, HIV and AIDS, and other services. Such mobilized target groups provide a good opportunity and platform for SPRING to consider in providing nutrition-based services and could perhaps help SPRING combat the low levels of respondents who report having received nutrition messages.

Given the role that family and community members play in sharing nutrition messages with mothers of children 0–23 months, improved male involvement interventions coupled with involvement of the civil society and religious leaders could help support and encourage mothers to improve nutrition practices among children and at the household level. The low levels of respondents who reported receiving nutrition messages indicates that there is room to scale up SBCC activities.

Evidence-based and district-centered information is vital for efficient allocation of scarce resources, planning, and decision making—and this can be made possible through the use of LQAS data at district or lower levels. Among intervention districts, there is a need to prioritize all intervention districts but with special emphasis on Ntungamo and Kisoro districts as they presented lower proportions on some IYCF indicator results when compared to Namutumba district. The focus should also be placed on the following IYCF and other indicators as they were found to have low performance: Minimum meal frequency, minimum acceptable diet, consumption of iron-rich or iron-fortified foods, and consumption of fortified foodstuffs such as maize flour and cooking oil. Consumption of fortified foods was found to be low, possibly due to low household incomes or low availability of fortified products in the market.

Follow-up action research on some of the key indicator findings may be imperative to explain certain behaviors. As in other quantitative studies, numbers or proportions on their own may not fully explain some situations but can be supplemented with follow-up qualitative research findings. Therefore, a diagnostic study is recommended to follow up on some of the baseline findings that have been indicated in this report.

It is recommended that the next survey reconsiders the required LQAS sample per age category in order to fulfill the required level of precision for results on some of the affected WHO IYCF recommended indicators that had a sample size too low for the recommended analyses. A sample size of 95 or more biological mothers per district with children in the following age categories would be helpful: 0–5, 6–8, 12–15, and 20–23 months. Such a change to the sampling system can

only be conducted, however, if more resources are available for data collection.

A benefit of using the Aggregated LQAS methodology rather than standard random sampling at the district level is the ability to classify SA performance to target intervention efforts in areas where they are most needed. Overall, these baseline findings should help SPRING target its programming to lower-performing areas and assess the need for different types of programs across its districts as a whole.

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# 7.0 APPENDICES

## APPENDIX I. SURVEY RESULTS FOR VARIOUS NUTRITION INDICATORS

INDICATOR CODE	INDICATOR	DISAGGREGATION				SOUTHWEST DISTRICTS					EAST CENTRAL DISTRICTS			
		Intervention Districts		Control Districts		Total Southwest Districts	P-value (intervention vs. control) or age comparisons	Intervention District	Control District	Total East Central Districts	P-value (intervention vs. control) or age comparisons			
		Kisoro	Neugamo	Total	Buweju	Rubirizi	Total		Namutumba	Mayuge				
IYCF1	<b>Early initiation of breastfeeding:</b> % of children born in the last 24 months that were put to breast within one hour of birth.	77.9	89.0	83.4	64.1	81.8	72.9	78.1	76.3	77.4	76.8	p = 0.808		
IYCF2	<b>Exclusive breastfeeding under 6 months:</b> % of infants 0–5 months who are fed exclusively with breastmilk	◇	◇	63.7	◇	◇	59.1	61.2	◇	◇	41.2			
IYCF3	<b>Continued breastfeeding at one year:</b> % of children 12–15 months who are fed breastmilk	◇	◇	82.6†	◇	◇	87.7†	85.1	95.2†	83.7†	89.4†	p = 0.084		
IYCF4	<b>Introduction of solid, semi-solid, or soft foods:</b> % of infants 6–8 months who received solid, semi-solid, or soft foods (note: sample size for this indicator was low but acceptable when control and intervention results are aggregated)	◇	◇	72.7†	*	*	92.7†	81.3	*	*	89.4†			

IYCF5	<b>Minimum dietary diversity:</b> % of children 6–23 months who received foods from four or more food groups	Total	43.2	43.3	43.3	53.6	52.9	53.3	48.1	p = 0.017	51.0	52.3	51.6	p = 0.830	
		6–11 months	◇	◇	◇	◇	◇	◇	36.5	*	*	*	41.9†		
		12–17 months	◇	◇	◇	◇	◇	◇	52.9	p = 0.001	◇	◇	◇	54.8	p = 0.063
		18–23 months	◇	◇	◇	◇	◇	◇	54.5		◇	◇	◇	59.4†	
IYCF6	<b>Minimum meal frequency:</b> % of breastfed and non-breastfed children 6–23 months who received solid, semi-solid, or soft solid (but also including milk feeds for non-breastfed children) the minimum number of times or more	Total	37.8	37.6	37.7	55.8	58.1	56.9	47.1		33.8	34.1	33.9		
		6–11 months	◇	*	34.3	◇	◇	64.6†	48.1		◇	◇	44.1		
		12–17 months	◇	◇	43.8	◇	◇	50.5	47.1		◇	◇	29.4		
		18–23 months	◇	◇	35.1	◇	◇	56.7	46.1		◇	◇	28.1		
IYCF7	<b>Minimum acceptable diet:</b> % of children 6–23 months who received a minimum acceptable diet (apart from breastmilk)	Total	17.6	16.3	17.0	26.1	22.8	24.5	20.6		21.2	17.4	19.4		
		6–11 months	◇	◇	11.1	◇	◇	37.8	23.2		◇	◇	45.2		
		12–17 months	◇	◇	20.8	◇	◇	37.9	29.3		◇	◇	37.5	p = 0.428	
		18–23 months	◇	◇	20.2	◇	◇	48.5	34.6		◇	◇	28.1		
IYCF8	<b>Consumption of iron-rich or iron-fortified foods:</b> % of children 6–23 months who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home	Total	18.2	16.3	17.3	23.9	59.6	41.6	29.1	p < 0.001	◇	◇	37.6	p = 0.031	
		6–11 months	◇	◇	11.1	◇	◇	37.8	23.2		◇	◇	45.2		
		12–17 months	◇	◇	20.8	◇	◇	37.9	29.3		◇	◇	37.5	p = 0.428	
		18–23 months	◇	◇	20.2	◇	◇	48.5	34.6		◇	◇	28.1		
IYCF9	<b>Children ever breastfed:</b> % of children born in the last 24 months who were ever breastfed	Total	98.4	97.3	97.9	98.4	95.3	96.9	97.4	p = 0.377	95.8	85.0	90.4	p = 0.002	
		0–11 months	100.0	93.9	99.5	99.0	97.9	98.4	99.0		98.9	87.0	93.0	p = 0.185	
		12–23 months	96.8	95.7	96.3	97.9	92.7	95.3	95.8		92.6	83.2	87.9		
IYCF10	Continued breastfeeding at 2 years: % of children 20–23 months who are fed breastmilk (sample size not very reliable when reporting disaggregation involved herein)	Total	◇	◇	43.8†	◇	◇	49.1†	46.2	p = 0.567	◇	◇	46.9†		

IYCF11	<b>Age-appropriate breastfeeding:</b> % of children 0–23 months who are appropriately breastfed	Total	73.7	66.8	70.3	75.0	69.8	72.4	71.3	71.6	62.1	66.8		
IYCF12	<b>Predominant breastfeeding under 6 months:</b> % of infants 0–5 months who are predominantly breastfed	Total	◇	◇	65.9	◇	◇	63.6	64.7	◇	◇	56.7		
IYCF13	<b>Duration of breastfeeding:</b> median duration of breastfeeding among children 0–35 months	Data for this indicator is missing as no information from a sample size beyond 24 months was collected during this survey												
IYCF14	<b>Bottle feeding:</b> % of children 0–23 months who are fed with a bottle	Total	2.2	4.1	3.1	5.3	4.8	5.1	4.1	3.2	6.2	4.7	$p = 0.403$	
		0–5 months	◇	*	1.2	◇	2.8	2.1	◇	◇	◇	◇	0.0 <sup>†</sup>	
		6–11 months	◇	◇	2.2	◇	12.4	7.0	◇	◇	◇	◇	11.4 <sup>†</sup>	$p = 0.006$
IYCF15	<b>Milk feeding frequency for non-breastfed children:</b> % of non-breastfed children 6–23 months of age who receive at least two milk feedings ( <i>note: sample size not very reliable when reporting disaggregation involved herein</i> )	12–23 months	◇	◇	4.4	◇	3.2	3.8	◇	◇	◇	3.8		
		Total	◇	◇	25.4	◇	18.2	22.0	◇	◇	◇	17.7 <sup>†</sup>		

#### ADDITIONAL INDICATORS

AI	% of biological mothers of children 6–23 months who reported that their children consumed any food to which they added a powder or sprinkles within the last 24 hours prior to the survey	Total	3.2	2.2	2.7	2.9	0.0	1.5	2.1	6.0	0.8	3.7	$p = 0.074$
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A2	% of biological mothers of children 6–23 months who reported that their children consumed any food to which they added a powder or sprinkles within the last 6 months prior to the survey	Total	6.1	13.9	10.5	13.3	0.0	7.1	8.7	p = 0.186	8.2	5.7	7.1	p = 0.740	
A3	% of pregnant women attending ANC at least one time during the last pregnancy	Total	97.4	96.8	97.1	99.0	96.9	97.9	97.5	p = 0.471	97.9	98.4	98.2	p = 0.703	
		0–11 months	96.8	95.8	96.3	97.9	94.8	96.4	96.3	p = 0.984	97.9	97.9	97.9	p = 1.000	
		12–23 months	97.9	97.9	97.9	100.0	99.0	99.5	98.7	p = 0.173	97.9	99.0	98.4	p = 0.561	
A4	% of pregnant women attending ANC at least four times during the last pregnancy	Total	38.4	60.5	49.5	58.9	68.2	63.5	56.5	p = 0.001	54.7	55.3	55.0	p = 0.046	
		0–11 months	40.0	57.9	49.0	55.2	68.8	62.0	55.5	p = 0.016	55.8	57.9	56.8	p = 0.204	
		12–23 months	36.8	63.2	50.0	62.5	67.7	65.1	57.6	p = 0.025	53.7	52.6	53.2	p = 0.180	
A5	% of deliveries that were assisted by a trained/skilled health service provider (doctor/nurse/midwife/nursing aide)	Total	73.2	76.8	75.0	60.9	75.0	68.0	71.5	p = 0.031	74.7	76.3	75.5	p = 0.720	
		0–11 months	76.8	82.1	79.5	63.5	81.3	72.4	75.9	p = 0.106	75.8	83.2	79.5	p = 0.209	
		12–23 months	69.5	71.6	70.5	58.3	68.8	63.5	67.0	p = 0.147	73.7	69.5	71.6	p = 0.520	
A6	% of deliveries that took place in a health facility	Total	67.4	74.7	71.7	65.1	70.8	68.0	69.5	p = 0.355	74.7	81.6	78.2	p = 0.107	
		0–11 months	68.4	79.0	73.7	69.8	75.0	72.4	73.0	p = 0.777	72.6	81.1	76.8	p = 0.169	
		12–23 months	66.3	70.5	68.4	60.4	66.7	63.5	66.0	p = 0.314	76.8	82.1	79.5	p = 0.369	
A7	% of women who reported having taken iron and the number of days they took it for during their last pregnancy	1–89 days	6.3	21.6	14.0	3.7	7.8	5.7	9.8	p < 0.001					10.5
		90–179 days	81.6	57.4	69.5	83.9	79.2	81.5	75.5						77.9
		180–270 days	1.1	1.6	1.3	0.0	3.7	1.8	1.6						0.8
		Did not take	11.1	19.5	15.3	12.5	9.4	10.9	13.1						10.8

A8	% of women who reported having taken any drug for intestinal worms during their last pregnancy	total	66.7	53.0	59.8	69.3	59.2	64.2	62.1	p = 0.001	48.6	66.7	57.7	p = 0.002
A9a	% of households that consumed <b>maize flour</b> during the last 7 days prior to the survey	total	79.9	83.4	81.7	64.6	64.2	64.4	73.0	p < 0.001	70.6	78.8	74.7	p = 0.069
A9b	% of households that consumed <b>fortified maize flour</b> during the last 7 days prior to the survey	total	13.2	25.3	19.2	5.7	4.2	5.0	12.0	p < 0.001	2.6	30.5	16.6	p < 0.001
A10a	% of households that consumed <b>cooking oil</b> during the last 7 days prior to the survey	total	26.3	55.1	40.8	31.6	51.8	41.4	41.3	p = 0.784	89.8	82.5	86.2	p = 0.043
A10b	% of households that consumed <b>fortified cooking oil</b> during the last 7 days prior to the survey	total	13.7	22.1	17.9	20.8	9.9	15.4	16.6	p < 0.001	45.8	59.0	52.4	p < 0.001
A11a	% of households that consumed <b>salt</b> during the last 7 days prior to the survey	total	96.8	100.0	98.4	99.5	92.2	95.8	97.1	p = 0.033	96.8	85.3	91.1	p < 0.001
A11b	% of households that consumed <b>fortified salt</b> during the last 7 days prior to the survey	total	56.3	82.6	69.5	73.4	71.9	72.7	71.1	p = 0.246	73.7	67.9	70.8	p < 0.001

† represents results derived from a sample below the recommended sample size.

◇ Sample size is too low for results to be disaggregated.

## APPENDIX 2. MESSAGING FOR SOCIAL AND BEHAVIORAL CHANGE COMMUNICATION INDICATOR RESULTS, 2013

	SOUTHWEST DISTRICTS						EAST CENTRAL DISTRICTS		
	Intervention Districts			Control Districts			Total Intervention District	Total Control District	
	Kisoro	Ntungamo	Total	Buhweju	Rubirizi	Total	Namutumba	Mayuge	
N/A	% of individuals reporting that their household has received at least one message about proper nutrition for women or children in the last 3 months	28.6	23.9	26.3	39.5	11.2	25.3	16.7	37.4
N/B	(Of those individuals who received) % of individuals that received at least one message about proper nutrition for women or children in the last 3 months by format								
N/B1	Health facility	56.8	26.9	43.2	47.8	25.0	42.8	38.3	75.2
N/B2	Village health worker/team	40.7	17.9	30.4	23.0	43.8	27.6	8.5	42.9
N/B3	Traditional health providers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9
N/B4	Family member	3.7	1.5	2.7	1.8	0.0	1.4	2.1	0.0
N/B5	Neighbor/Friend	2.5	0.0	1.4	6.2	3.1	5.5	0.0	2.9

N1B6	Child who attends school	0.0	0.0	0.0	0.0	0.0	0.0	6.3	1.4	2.1	0.0
N1B7	Community gathering	0.0	25.4	11.5	23.9	6.3	20.0	8.5	4.8		
N1B8	Radio	49.4	50.8	500	69.0	28.1	60.0	59.6	26.7		
N1B9	Television	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0
N1B10	Internet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N1B11	Mobile phone messaging (phone text)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N1B12	Printed materials	0.0	1.5	0.7	1.8	0.0	1.4	0.0	1.0		
N1B13	Religious institution	2.5	1.5	2.0	8.0	0.0	6.2	0.0	0.0		
N1B14	Mother-to-mother group	2.5	1.5	2.0	3.5	0.0	2.8	0.0	1.9		
N2A	% of individuals reporting that their household has received at least one message about proper breastfeeding practices in the last 3 months	32.4	33.8	33.1	53.0	25.0	39.0	26.6	41.8		
N2B	(Of those individuals that received) % of individuals reporting that their household has received at least one message about proper breastfeeding practices in the last 3 months by format										
N2B1	Health facility	70.7	31.6	50.8	54.0	50.0	52.7	58.7	74.4		
N2B2	Village health worker/team	44.6	12.6	28.3	16.5	11.1	14.7	12.0	45.3		
N2B3	Traditional health providers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6		
N2B4	Family member	3.3	0.0	1.6	4.0	0.0	2.7	0.0	4.3		
N2B5	Neighbor/Friend	0.0	0.0	0.0	7.2	0.0	4.9	0.0	3.4		
N2B6	Child who attends school	2.2	0.0	1.1	0.7	0.0	0.5	0.0	0.9		
N2B7	Community gathering	1.1	20.0	10.7	19.1	4.2	14.3	2.7	4.3		

N2B8	Radio	42.4	45.3	43.9	58.6	29.2	49.1	50.7	31.6
N2B9	Television	1.1	0.0	0.5	1.3	4.2	2.2	0.0	2.6
N2B10	Internet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N2B11	Mobile phone messaging (phone text)	0.0	1.1	0.5	0.0	0.0	0.0	0.0	0.0
N2B12	Printed materials	1.1	1.1	1.1	3.3	0.0	2.2	1.3	3.4
N2B13	Religious institution	1.1	1.1	1.1	1.3	0.0	0.9	0.0	0.9
N2B14	Mother-to-mother group	6.5	3.2	4.8	1.3	0.0	0.9	0.0	3.4
N2C	(of those individuals that received) % of individuals reporting that their household has received at least one message about proper breastfeeding practices and the particular messages they received in the last 3 months								
N2C1	"Start breastfeeding within one hour of delivery"	35.9	37.9	36.9	28.3	36.1	30.8	30.7	55.6
N2C2	"Giving colostrum/first milk to child"	22.8	6.3	14.4	15.1	31.9	20.5	8.0	21.4
N2C3	"Feeding only breastmilk to children 0–6 months (exclusive breastfeeding)"	40.2	67.4	54.0	70.4	72.2	71.0	61.3	69.2
N2C4	"continuing breastfeeding through years"	30.4	19.0	24.6	36.2	6.9	26.8	18.7	18.0
N2C5	"Continuing breastfeeding through one year for HIV+ women"	6.5	2.1	4.3	2.0	1.4	1.8	0.0	0.0
N2C6	"Avoid bottle feeding"	5.4	0.0	2.7	2.6	5.6	3.6	6.7	8.6
N2C7	"Breastfeed child on demand"	13.0	12.6	12.8	19.7	37.5	25.5	20.0	0.9
N2C8	"Continuing breastfeeding during illness"	1.1	3.2	2.1	2.6	2.8	2.7	2.7	5.1
N3A	% of individuals reporting that their household has received at least one message about proper feeding for children 6 months or older in the last 3 months	34.9	33.5	34.2	49.3	18.5	33.9	29.5	41.2
N3B	(Of those individuals that received) % of individuals reporting that their household has received at least one message about proper feeding for children Six months or older in the last 3 months by format								

N3B1	Health facility	65.3	26.9	46.6	45.7	49.1	46.6	49.4	70.4
N3B2	Village health worker/team	48.0	8.6	28.8	17.1	30.2	20.7	20.5	42.6
N3B3	Traditional health providers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
N3B4	Family member	7.1	0.0	3.7	1.4	0.0	1.0	2.4	0.9
N3B5	Neighbor/Friend	4.1	1.1	2.6	7.1	0.0	5.2	0.0	0.0
N3B6	Child who attends school	4.1	1.1	2.6	0.0	0.0	0.0	0.0	1.7
N3B7	Community gathering	2.0	23.7	12.6	25.0	1.9	18.7	1.2	3.5
N3B8	Radio	37.8	54.8	46.1	61.4	28.3	52.3	49.4	40.0
N3B9	Television	0.0	0.0	0.0	0.7	1.9	1.0	0.0	2.6
N3B10	Internet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
N3B11	Mobile phone messaging (phone text)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N3B12	Printed materials	1.0	0.0	0.5	0.7	0.0	0.5	0.0	0.9
N3B13	Religious institution	3.1	2.2	2.6	4.3	0.0	3.1	0.0	0.0
N3B14	Mother-to-mother group	4.1	1.1	2.6	1.4	1.9	1.6	0.0	0.9
N3C	(Of those individuals that received) % of individuals reporting that their household has received at least one message about proper feeding for children 6 months or older and the particular messages they received in the last 3 months								
N3C1	"Introducing solid, semi-solid, or soft foods at 6 months	66.3	69.9	68.1	73.6	66.0	71.5	72.3	76.5
N3C2	"Giving children foods from four diverse groups"	31.6	46.2	38.7	30.7	37.7	32.6	1.2	44.4
N3C3	"Feeding children on demand, multiple times a day"	20.4	17.2	18.9	24.3	32.1	26.4	12.1	13.9
N3C4	"Continuing to breastfeed beyond 6 months with appropriate complementary foods"	23.5	29.0	26.2	37.9	34.0	36.8	34.9	21.7

N3C5	"Continuing feeding during illness"	5.1	3.2	4.2	5.0	3.8	4.7	1.2	1.7
N3C6	"Consumption of iron-rich or iron-fortified foods"	9.2	16.1	12.6	20.7	1.9	15.5	2.4	4.4
N3C7	"Others"	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N4A	% of individuals reporting that their household has received at least one message on deworming medications for children in the last 3 months	47.5	37.6	42.6	67.5	25.1	46.4	23.1	41.2
N4B	(Of those individuals that received) % of individuals reporting that their household has received at least one message on deworming medications for children in the last 3 months by format:								
N4B1	Health facility	64.4	46.2	56.4	58.6	38.0	53.0	63.1	64.9
N4B2	Village health worker/team	62.2	40.6	52.7	28.5	57.8	36.4	20.0	55.3
N4B3	Traditional health providers	0.0	0.9	0.4	0.0	0.0	0.0	1.5	0.9
N4B4	Family member	3.0	0.9	2.1	6.2	0.0	4.6	7.7	4.4
N4B5	Neighbor/Friend	3.0	0.0	1.7	7.3	1.4	5.7	1.5	1.8
N4B6	Child who attends school	10.4	9.4	10.0	8.8	0.0	6.4	3.1	4.4
N4B7	Community gathering	5.2	20.8	12.0	22.3	4.2	17.4	3.1	3.5
N4B8	Radio	31.1	23.6	27.8	52.3	22.5	44.3	38.5	38.6
N4B9	Television	0.0	0.0	0.0	0.0	1.4	0.4	0.0	0.0
N4B10	Internet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N4B11	Mobile phone messaging (phone text)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N4B12	Printed materials	0.0	0.0	0.0	1.0	0.0	0.8	0.0	0.9
N4B13	Religious institution	8.2	1.9	5.4	4.2	0.0	3.0	0.0	1.8

N4B14	Mother-to-mother group	1.5	0.9	1.2	0.0	0.0	0.0	0.0	0.0	0.9
N5A	% of individuals reporting that their household has received at least one message about how women can stay healthy during pregnancy in the last 3 months	33.7	36.4	35.1	52.5	30.9	41.7	20.9	37.6	
N5B	(Of those individuals that received) % of individuals reporting that their household has received at least one message about how women can stay healthy during pregnancy in the last 3 months by format									
N5B1	Health facility	62.4	43.1	52.3	55.7	64.4	58.9	60.3	71.8	
N5B2	Village health worker/team	46.2	9.8	27.2	23.5	17.2	21.2	10.3	39.8	
N5B3	Traditional health providers	0.0	0.0	0.0	0.0	1.2	0.4	1.7	1.0	
N5B4	Family member	111.8	1.0	6.2	4.0	0.0	2.5	1.7	2.9	
N5B5	Neighbor/friend	3.2	1.0	2.1	7.4	1.2	5.1	0.0	3.9	
N5B6	Child who attends school	5.4	0.0	2.6	0.7	0.0	0.4	1.7	1.9	
N5B7	Community gathering	2.2	17.7	10.3	25.5	2.3	17.0	6.9	2.9	
N5B8	Radio	37.6	46.1	42.1	63.8	21.8	48.3	48.3	31.1	
N5B9	Television	0.0	0.0	0.0	0.0	1.2	0.4	1.7	1.9	
N5B10	Internet	0.0	0.0	0.0	0.7	1.2	0.9	0.0	0.0	
N5B11	Mobile phone messaging (phone text)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
N5B12	Printed materials	1.1	1.0	1.0	1.3	0.0	0.9	0.0	2.9	
N5B13	Religious institution	2.2	1.0	1.5	5.4	1.2	3.8	0.0	0.0	
N5B14	Mother-to-mother group	4.3	1.0	2.6	1.3	0.0	0.9	1.7	0.0	
N5C	(Of those individuals that received) % of individuals reporting that their household has received at least one message about proper feeding for children 6 months or older and the particular message they received in the last 3 months									

N5C1	"Increase mother's dietary intake during pregnancy and lactation"	23.7	64.7	45.1	56.4	67.8	60.6	37.9	53.4
N5C2	"taking IFA during pregnancy"	8.6	7.8	8.2	4.7	2.3	3.8	3.5	14.6
N5C3	"being dewormed during pregnancy"	33.3	5.9	19.0	6.7	2.3	5.1	12.1	26.2
N5C4	"receiving IPT/anti-malarial during pregnancy"	10.8	11.8	11.3	8.1	10.3	8.9	32.8	24.3
N5C5	"using ITN during pregnancy"	1.1	22.6	12.3	22.8	2.3	15.3	31.0	22.3
N5C6	"attend antenatal care visits"	40.9	20.6	30.2	37.6	11.5	28.0	34.5	13.6
N5C7	"attend at least 4 ANC visits"	31.2	31.4	31.3	34.2	20.7	29.2	36.2	34.0
N5C8	"important of gaining adequate weight"	10.8	11.8	11.3	8.1	10.3	8.9	32.8	24.3
N5C9	"increasing rest time"	1.1	22.6	12.3	22.8	2.3	15.3	31.0	22.3
N5C10	"reducing workload"	40.9	20.6	30.3	37.6	11.5	28.0	34.5	13.6
N5C11	Consuming vitamin-A rich food	31.2	31.4	31.3	34.2	20.7	29.2	36.2	34.0
N5C12	Ways of minimizing side effects of IFA	31.2	31.4	31.3	34.2	20.7	29.2	36.2	34.0
N6A	% of individuals reporting that their household has received at least one message about when or how to wash hands in the last 3 months	48.9	42.1	1.1	58.8	41.3	0.4	44.3	40.8
N6B	(Of those individuals that received) % of individuals reporting that their household has received at least one message about when or how to wash hands in the last 3 months by format:								
N6B1	Health facility	48.6	28.6	39.3	40.7	26.9	35.0	50.0	51.3
N6B2	Village health worker/team	52.2	16.8	35.8	27.0	51.3	37.1	27.4	51.3
N6B3	Traditional health providers	0.0	0.0	0.0	0.6	0.0	0.4	0.8	1.8
N6B4	Family member	8.0	0.8	4.7	4.8	0.0	2.8	2.4	4.4

N6B5	Neighbor/Friend	2.9	0.8	2.0	4.2	0.0	2.5	0.0	3.5
N6B6	Child who attends school	5.8	1.7	3.9	9.0	0.0	5.2	0.8	3.5
N6B7	Community gathering	1.5	28.6	14.0	32.3	4.2	20.6	4.0	5.3
N6B8	Radio	44.2	45.4	44.8	59.9	31.1	47.9	61.3	47.8
N6B9	Television	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.3
N6B10	Internet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
N6B11	Mobile phone messaging (phone text)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
N6B12	Printed materials	0.0	0.0	0.0	1.8	0.0	1.1	0.0	1.8
N6B13	Religious institution	2.9	0.8	2.0	7.8	0.8	4.9	0.0	0.9
N6B14	Mother-to-mother group	0.7	0.0	0.4	1.8	0.0	1.1	0.0	3.5
N6C	(Of those individuals that received) % of individuals reporting that their household has received at least one message about when or how to wash hands and the particular messages they received in the last 3 months								
N6C1	"wash hands properly before preparing food"	44.9	44.5	44.8	53.3	57.1	54.9	25.0	44.3
N6C2	"wash hands properly before feeding children"	38.4	32.8	35.8	32.9	37.0	34.6	38.7	46.9
N6C3	"wash the child's hands before feeding"	23.2	24.4	23.7	22.8	32.8	26.9	36.3	49.6
N6C4	"wash hands after defecating/visiting the toilet"	73.9	80.7	77.0	77.8	76.5	77.3	83.9	46.0
N6C5	"using soap when washing hands"	36.2	55.5	45.1	31.1	35.3	32.9	23.4	46.9
N6C6	"others"	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N7	% of individuals who reported knowing what to do in case a child has diarrhea	26.3	30.9	28.6	23.6	13.5	18.6	16.8	42.8

N8	% of individuals who know what to do to prevent a child from getting diarrhea (the recommended 4Fs and boiled water)	0.4	1.8	1.1	0.4	4.9	2.6	0.4	8.4
N9	% of individuals who know when a new born should be put to breast after birth	68.3	89.0	78.7	67.4	74.6	71.0	72.1	80.4
N10	% of individuals who know what a woman who has just delivered should do with the first yellow breastmilk	78.5	78.1	78.3	79.1	73.8	76.4	71.3	76.3
N11	% of individuals who know how long a woman should exclusively breastfeed	62.9	83.7	13.6	78.8	71.5	12.0	65.6	67.2



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