MOMENTUM

Integrated Health Resilience

# MOMENTUM INTEGRATED HEALTH RESILIENCE HOUSEHOLD NUTRITION SURVEY

## Household knowledge, attitudes, and practices in North Kivu, Democratic Republic of the Congo (DRC)

**FINAL REPORT**

Submission date: April 21, 2023

Submitted to:

United States Agency for International Development under
Cooperative Agreement # 7200AA20CA00005

Submitted by:

IMA World Health, with JSI Research & Training Institute, Inc.; Pathfinder International; Cooperative for Assistance and Relief Everywhere, Inc. (CARE); GOAL USA Fund; and the Africa Christian Health Associations Platform (ACHAP)

USAID FROM THE AMERICAN PEOPLE

MOMENTUM A Global Partnership for Health and Resilience

## Disclaimer

MOMENTUM Integrated Health Resilience is funded by the U.S. Agency for International Development (USAID) as part of the MOMENTUM suite of awards and implemented by IMA World Health (IMA) with partners JSI Research &Training Institute, Inc. (JSI), Pathfinder International, GOAL USA Fund, CARE, and Africa Christian Health Associations Platform (ACHAP), along with Premise Data, Harvard T.H. Chan School of Public Health Department of Global Health and Population, Johns Hopkins Bloomberg School of Public Health Department of International Health, and Brigham Young University as resource partners, under USAID cooperative agreement #7200AA20CA00005. For more information about MOMENTUM, visit www.USAIDMomentum.org. The contents of this document are the sole responsibility of IMA World Health and do not necessarily reflect the views of USAID or the United States Government.

# ABSTRACT

The eastern Democratic Republic of the Congo (DRC) is a fragile and high-conflict region where child health indicators are historically below optimal levels. Stunting and wasting continue to be major problems. This is especially true in North Kivu, a province in the east characterized by multiple armed groups and conflicts, frequent disease outbreaks, and natural hazards. In the summer of 2022, MOMENTUM Integrated Health Resilience (MIHR) conducted a knowledge, attitudes, and practices (KAP) survey in the catchment areas of 60 MIHR-supported facilities across 10 health zones in North Kivu. Data were collected from 1,089 primary caregivers of children under 2 years of age using a one-time, cross-sectional survey. Respondents provided information about demographics, child nutrition, maternal and child dietary recall, family planning, household decision-making, and child illness. Data were cleaned and analyzed using the STATA 17 software package. Univariate statistics were computed to present frequencies of key variables, and chi-square test statistics were computed to test for differences across stratifications by age group, reading ability, and education. Logistic and linear regression analyses were used to assess the magnitude of association between demographics and key outcomes. All models controlled for clustering at the village level. Approximately 46 percent of children achieved minimum dietary diversity, 35 percent were exclusively breastfed, and only 16 percent had a minimum acceptable diet. By comparison, most caregivers achieved minimum dietary diversity. Most (88 percent) respondents reported at least some involvement in at least one household decision. Fewer than 15 percent said they had used family planning methods during the postpartum period. Frequency of a child under 5 years of age in the household with diarrhea or cough with fast/difficult breathing in the 2 weeks prior to the survey was 24 percent and 17 percent, respectively. In conclusion, children in North Kivu do not get adequate diversity in their diet and too few are exclusively breastfed. Results from this study suggest that exclusive breastfeeding in the first 6 months of life and dietary diversity thereafter should be an important program focus. Community-based interventions like infant and young child feeding support groups and social and behavior change programming aimed at promoting breastfeeding and disputing myths around exclusive breastfeeding were recommended by key stakeholders during a KAP results workshop to address these challenges.

# ACKNOWLEDGMENTS

MOMENTUM Integrated Health Resilience would like to acknowledge USAID staff for their support; the USAID DRC Field Support Team for their inputs; local officials from PRONANUT and the Health Zone Central Office (BCZ); Eta Mbong, Dominique Badibanga, and Pierre Itongwa with MOMENTUM Integrated Health Resilience/DRC for their input and participation in the study design, dissemination, and consultations; and Heather Forrester, MOMENTUM Integrated Health Resilience core, for her country team support, and Kirk Dearden, core Nutrition Lead, for his technical contributions to the survey instrument. We would also like to acknowledge our Premise colleagues, Bret Quin and Annalise Miller, for their flexibility and excellent technical support during data collection, and Josh West, Ben Crookston and Cougar Hall for their data analysis and report writing support. Finally, we offer sincere appreciation to the survey respondents in North Kivu who shared their valuable information with us.

# CONTENTS

## TABLES

# FIGURES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ANC | Antenatal care |
| BCZ | Central Office of the Health Zone |
| CARE | Cooperative for Assistance and Relief Everywhere, Inc. |
| CHW | Community health worker |
| CI | Confidence interval |
| DHS | Demographic and health survey |
| DPS | Provinciales de la Santé |
| DRC | Democratic Republic of the Congo |
| FP | Voluntary family planning |
| HZ | Health Zone |
| INS | Institut National de Statistiques |
| IYCF | Infant and young child feeding |
| JSI | JSI Research & Training Institute, Inc. |
| KAP | Knowledge, attitudes, and practices |
| MCHN | Office of Maternal and Child Health and Nutrition (USAID) |
| MICS | Multiple indicator cluster surveys |
| MIHR | MOMENTUM Integrated Health Resilience |
| MNCH | Maternal, newborn, and child health |
| MNCHN | Maternal, newborn, and child health and nutrition |
| MOH | Ministry of Health |
| MOMENTUM | Moving Integrated, Quality Maternal, Newborn, and Child Health and Family Planning and Reproductive Health Services to Scale |
| NGO | Nongovernmental organization |
| RH | Reproductive health |
| SBC | Social and behavior change |
| TA | Technical assistance |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |

# EXECUTIVE SUMMARY

The purpose of this assessment was to gain a better understanding of knowledge, attitudes, and practices (KAP) related to child and caregiver nutrition, household decision-making, voluntary family planning, and child health. A one-time, cross-sectional survey was conducted in North Kivu, with a total of 1,089 caregivers. The respondents represented 10 health zones supported by MOMENTUM Integrated Health Resilience. Katwa (30 percent), Beni (24 percent), Rutshuru (13 percent), and Nyiragongo (11 percent) were the most represented health zones. Most caregivers were married, had achieved a level of secondary education, resided in a home of four to seven persons, and were aged 18-24 years old.

The survey revealed that there was a high prevalence of early initiation of breastfeeding (88 percent) and much lower prevalence of exclusive breastfeeding (35 percent). The proportion of children that met standards for minimum diet diversity and minimum acceptable diet were 46 percent and 16 percent, respectively. Prevalence of exclusive breastfeeding was highest in Kalunguta and Katwa, diet diversity was highest in Rutshuru and Beni, and minimum acceptable diets were highest in Katwa and Beni. By comparison, 69 percent of caregivers achieved a minimum diverse diet with the highest prevalence observed in Rutshuru (82 percent), Beni (73 percent), and Katwa (73 percent).

Almost one-third of caregivers reported some level of involvement in all major household decisions on food, healthcare, attending to sick children, having additional children, and use of modern contraception. Caregivers in Mabalako, Beni, and Nyiragongo reported the highest prevalence of involvement in decision-making. In most health zones, involvement in decision-making was highest related to using modern contraception and decisions about food, and lowest for decisions related to dealing with a sick child. Use of voluntary family planning was less than 15 percent overall; the highest was in Katwa (29 percent) and lowest in Nyiragongo (7 percent), Rutshuru (0 percent), and Kalunguta (0 percent).

Having a child under 5 years of age in the household with diarrhea or cough with fast/difficult breathing in the 2 weeks prior to the survey was reported at 24 percent and 17 percent, respectively. Approximately 68 percent of caregivers sought treatment for cough and fast/difficult breathing and almost all caregivers (96 percent) sought advice or treatment for diarrhea. All treatment for cough and fast/difficult breathing was given at a health facility and nearly all diarrhea treatment (97 percent) was facility-based. Approximately 10 percent of caregivers reported any barriers to treatment, and most of those were related to fees for care. A series of multivariate regression analyses were conducted to explore the role of key demographics and their association with KAPs. Caregiver literacy was associated in a negative direction with some child nutrition and health outcomes, while caregiver age and having a male child were positively associated. Exploratory analyses to understand the relationship of household decision-making and outcomes of interest revealed that caregiver involvement in household decisions was positively associated with exclusive breastfeeding and minimum dietary diversity for the child and caregiver.

Results from this assessment suggest that exclusive breastfeeding in the first 6 months of life and dietary diversity thereafter should be an important program focus. A results dissemination workshop was held with key stakeholders after study completion where community based interventions like

infant and young child feeding (IYCF) support groups and social and behavior change (SBC) programming aimed at promoting breastfeeding and disputing myths around exclusive breastfeeding were recommended to address these challenges.

# I. INTRODUCTION

The Democratic Republic of the Congo (DRC) ranks among the poorest nations in the world. Years of armed conflict and instability in the country have led to population displacements, the loss of productive assets, and increased food insecurity. Approximately 25 percent, or 6.8 million, Congolese are food insecure (IFSP, 2022). Child undernutrition in the DRC ranks among the highest in the world (UNICEF, 2013). Childhood stunting, a primary indicator of chronic child undernutrition, remains high with 42 percent of children reported as stunted (INS, 2018). Childhood wasting, a measure of acute childhood undernutrition or illness, impacts 7 percent of children under age 5 in the DRC (INS, 2018). The World Health Organization (WHO) considers childhood stunting prevalence over 30 percent to be severe, and a wasting prevalence above 5 percent as indicative of food insecurity (WHO, 1997).

Child nutrition and health are complex in nature and associated with a variety of individual and societal-level factors including breastfeeding practices, dietary diversity, household decision-making, and a primary female caregiver's nutritional status. Many factors have been shown to influence exclusive breastfeeding in the DRC, including a mother's high work burden, her lack of decision-making power in the household, and her perceived milk insufficiency (Burns et al., 2016). Childhood nutrition and health is similarly impacted by household decision-making related to the allocation of limited resources. Approximately 25 percent of women in the DRC report not participating in decisions related to household purchases (DHS, 2014). This pattern is consistent for the North Kivu region of the DRC, where fathers maintain decision-making authority in most households (Slegh et al., 2014). Research exploring the impact of a mother's decision-making power on childhood nutrition in the DRC has produced mixed findings (Bapolisi et al., 2021; McKenna et al., 2019), yet a woman's lack of autonomy has generally been associated with increased odds of having an undernourished child (Carlson et al., 2015; Cunningham et al., 2015; Shafiq et al., 2019). Women's nutritional status is associated with the nutritional security of children (Black et al., 2008; Dharmalingam et al., 2010). Unhealthy maternal eating patterns, including skipping meals and consuming nutrient-deficient foods, are subsequently associated with nutrient deficiencies in infants and children. A caregiver's nutrition-related knowledge, attitudes, and practices (KAPs), together with opportunities of autonomous household decision-making, are thus essential in promoting childhood health generally and addressing childhood nutrition specifically.

## EVALUATION PURPOSE

The primary aim of this study was to better understand KAPs around nutrition, household decision-making, voluntary family planning (FP), and child health among female caregivers of children under 2 years of age in North Kivu. Specific objectives were:

- Identify the baseline knowledge, attitudes, and behaviors in relation to child and caregiver nutrition, household decision-making, family planning, and child health.

- Assess the relationship between demographic characteristics of the survey respondent and key KAPs.

## RESEARCH QUESTIONS

Specific research questions included:

1. What is the prevalence of key KAPs related to child and caregiver nutrition?
2. What is the prevalence of key KAPs related to household decision-making?
3. What is the prevalence of key KAPs related to child health?
4. What is the prevalence of key KAPs related to family planning?
5. What is the relationship between participant demographics and key KAPs?

# II. PROJECT BACKGROUND

Moving Integrated, Quality Maternal, Newborn, and Child Health and Family Planning and Reproductive Health Services to Scale (MOMENTUM) Integrated Health Resilience (MIHR) is a global U.S. Agency for International Development (USAID) cooperative agreement designed to strengthen quality voluntary family planning and reproductive, maternal, newborn, child, and adolescent health (FP/RMNCAH) service delivery and build health resilience in fragile settings. It is part of USAID's MOMENTUM suite of awards, which ensures that investments in USAID partner countries along the humanitarian-development nexus are tailored to country contexts and foster sustainability.

MIHR works with governments, private sector actors, and global and local multi-sectoral partners to strengthen youth, gender, and community responsiveness, reach under-served populations, and develop appropriate and sustainable FP/RMNCAH programming. The results improve both the health and non-health-related outcomes for women, children, families, and their communities; empower women and girls; and improve interactions between populations, health, and the environment. The project reinforces evidence-based decision-making and ongoing identification of innovations to strengthen health systems in fragile settings.

Following the end of the 10th Ebola virus disease outbreak in North Kivu in September 2020, USAID/DRC asked MIHR to implement a post-Ebola transition and recovery plan in North Kivu to support the restoration of health services while also laying the groundwork for building health resilience. The project also focused on strengthening effective cross-sectoral collaboration between the developing health sector and humanitarian organizations currently operating in North Kivu. MIHR was tasked with conducting intensive activities in 10 Ebola-affected Health Zones (HZs): Butembo, Katwa, Kalunguta, Beni, Mabalako, Nyiragongo, Rutshuru, Rwanguba, Goma, and Karisimbi.

# III. EVALUATION METHODS

## DEVELOPMENT OF QUESTIONNAIRES

The questionnaire was developed based on the objectives of the evaluation. Questions were selected from standardized surveys/indicators, including Demographic and Health Surveys (DHS) and multiple indicator cluster surveys (MICS). The dietary recall questions are standard questions from the *Minimum Dietary Diversity for Women* and the World Health Organization (WHO) *2021 Indicators for Assessing Infant and Young Child Feeding Practices: Definitions and Measurement*. Adaptations to the food-related questions were made by the MIHR/DRC technical team to ensure local relevance.

## MEASUREMENT

### DEMOGRAPHICS

Caregivers were asked to report about demographic characteristics, including age, education, literacy, number of people living in the household, marital status, and wealth. Education was measured by asking caregivers to report the highest level of education obtained. Literacy was measured by presenting respondents with a short sentence in Swahili and asking them to read the sentence. For this report, women were coded as unable to read if they could not read the sentence in whole or in part. This coding scheme was used to clearly distinguish respondents that had the ability to read from others. Wealth was measured by asking women to report about their financial situation. Response options included "I can afford food and regular expenses, but nothing else," and "I cannot afford enough food for my family."

### CHILD NUTRITION INDICATORS

Women were asked to recall their child's recent diet. Responses were used to calculate a series of standard WHO infant and young child feeding (IYCF) nutritional indicators. Details about the construction of these indicators are provided below.

**Table 1. Child Nutrition Indicators**

| Indicator | Definition |
|---|---|
| **Early initiation of breastfeeding** | Children that were under 2 years of age and were breastfed within 1 hour of birth. |
| **Exclusive breastfeeding** | Children under 6 months of age that were breastfed in the past 24 hours and were not fed any other type of milk products or solid or semi-solid foods. |
| **Mixed milk feeding** | Children under the age of 6 months, were breastfed in the past 24 hours, and received some type of milk product, including milk from animals, such as fresh, tinned, or powdered milk. |
| **Introduction of solid, semi-solid, or soft foods 6-8 months** | Children between the ages of 6-8 months that received any of the following foods in the past 24 hours: yogurt, porridge/bread/rice/noodles/pasta, |

| Indicator | Definition |
|---|---|
| | pumpkin/carrots/sweet peppers/squash/sweet potatoes that are yellow or orange, plantains/white potatoes/white yams/manioc/cassava, dark green leafy vegetables such as Sakuma wiki, other vegetables, ripe mangoes/ripe papaya, fresh fruit, liver/kidney, sausages/hot dogs/ham/bacon/salami/canned meat, other meats like beef/pork/lamb/goat/chicken/duck, eggs, fresh fish/dried fish/shellfish, beans, peas, lentils, seeds, hard or soft cheese, sweet foods such as chocolates/candies/pastries/cakes/biscuits/frozen treats/ice cream/popsicles, chips/crisps/puffs/French fries/fried dough/instant noodles, any other solid or semisolid or soft food. |
| **Minimum dietary diversity** | Children that were ages 6 months to 2 years and were reported to have consumed any number of food items from at least 5 of 8 categories were coded as having achieved a minimum level of dietary diversity. These categories included: grains, legumes, dairy, fleshy foods, eggs, vitamin rich foods, fruits and vegetables, and breastmilk. |
| **Minimum meal frequency** | Children that were ages 6 months to 2 years were coded as having achieved a minimum meal frequency if they were:<br>• Between the ages of 6 months and 9 months and were breastfed and had at least two meals during the past 24 hours.<br>• Between the ages of 9 months and 24 months and were breastfeed and had at least three meals during the past 24 hours.<br>• Between the ages of 6 months and 24 months and were not breastfed and had a minimum of four meals during the past 24 hours. |
| **Minimum acceptable diet** | Children that achieved minimum dietary diversity and minimum meal frequency were then coded as having achieved a minimum acceptable diet. |

## MATERNAL NUTRITION INDICATORS

Primary female caregivers were asked to recall their own diet during the previous 24 hours. Their responses were used to create a minim dietary diversity variable. Respondents that reported consuming any number of food items from at least five of seven categories were coded as having achieved a minimum level of dietary diversity. These categories included: grains, legumes, dairy, fleshy foods, eggs, vitamin rich foods, and fruits and vegetables.

## INTRA-HOUSEHOLD DECISION-MAKING

A series of questions (Figure 1) helped to elucidate the household decision-making dynamics. Questions were modified from Oxfam's (2017) "A 'How To' Guide to Measuring Women's Empowerment."

**Figure 1. Intra-Household Decision-Making**


A common set of response options was presented for each of the questions in the graphic above and respondents were asked to select one of the following options: a) respondent alone, b) husband/partner alone, c) respondent and husband/partner jointly, d) someone else (e.g., mother-in-law, traditional healer), e) respondent and someone else jointly, and f) decision not made/not applicable. A scaled variable representing women's decision-making autonomy was constructed (alpha = .70). This variable has a range of 0–5. A score of 0 was scored as no involvement, 1 was low involvement, 2 was moderate involvement, 3 was medium involvement, 4 was high involvement, and 5 was complete involvement. Women were coded a 1 on any single question if they reported having any involvement in household decision-making (i.e., a, c, or e). The scores for each of the five variables were then summed for a maximum possible score of 5. The combined score was used to categorize caregivers' involvement in decision-making along a continuum from no involvement (no independent

and no shared decision-making) to complete involvement (some role in decision-making for all the scenarios presented).

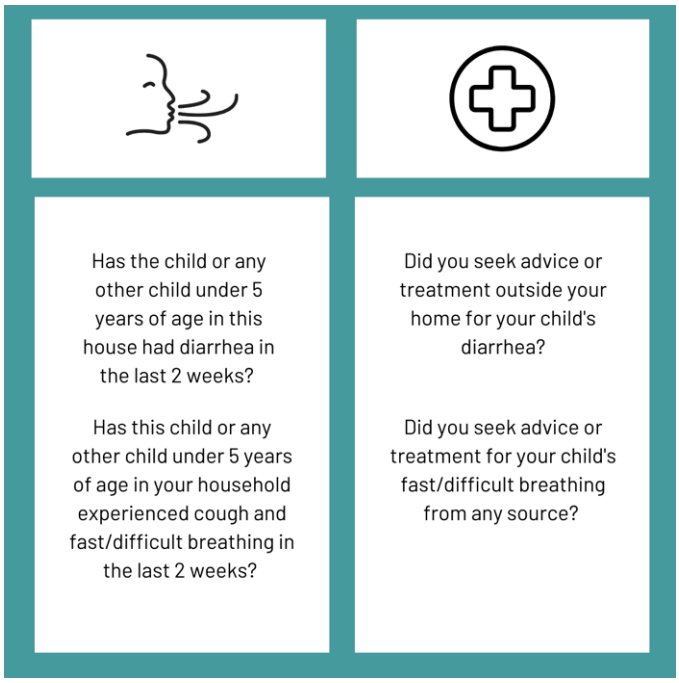
## FAMILY PLANNING

A single item was used to represent FP and was measured by asking women, “Did you have access to, or have you used an FP method during the postpartum period?” (Yes or No) Use was ascertained by identifying caregivers that were able to report the type of FP method that was used.

## CHILDHOOD ILLNESS

Two major categories of childhood illness variables were collected (Figure 2) and included diarrhea and cough and fast/difficult breathing. Both conditions were referencing cases in the 2 weeks preceding the survey.

**Figure 2. Childhood Illness Questions**




For each condition, a series of questions was asked related to where treatment was sought, how promptly treatment was sought, where treatment was sought, and what treatment was provided. Barriers to care were of keen interest, and caregivers were asked: “What barriers or challenges did you experience when you took or wanted to take your child to the health facility?”

Respondent knowledge of danger signs during the first 7 days after birth was evaluated using the following question: “What are some serious health problems that can occur during the first 7 days after birth that could endanger the life of a newborn baby?”

**Table 2. Newborn Danger Signs**

| | |
|---|---|
| Response Options | Difficult or fast breathing |
| | Yellow skin/eye color (jaundice) |
| | Poor sucking or feeding |
| | Baby very small |
| | Pus, bleeding, or discharge from around the umbilical cord |
| | Skin lesions or blisters |
| | Convulsions/spasms/rigidity |
| | Lethargy/unconsciousness |
| | Red or swollen eyes with pus |
| | Baby appears blue |
| | Baby feels cold |
| | Fever |

A total knowledge score was computed (alpha = .80) to represent a caregiver's knowledge of potential danger signs. All the response options represent actual dangers and a score of 1 was coded for each positive identification of a danger sign. The composite variable was computed by summing the total number of correct responses. The variable had a range of 0 – 13. To correct for data abnormalities, this variable was recategorized as follows: 0 signs identified, 1 sign identified, 2-4 signs identified, 5-7 signs identified, 8 or more signs identified.

## DIGITAL DATA COLLECTION

Data were collected via smartphones. The survey was uploaded onto a secure, online platform managed by Premise. The questionnaires were available electronically/digitally in English, Swahili, and French. However, the survey was administered verbally by the data collector in the respondent's preferred language. To be selected for this study, data collectors were required to demonstrate proficiency in French, Swahili, and local languages (e.g., Nande) used in their assigned clusters. Respondents were read a consent statement and provided verbal consent to participate. See Appendix 2 for the full version of the survey instrument.

## RECRUITMENT OF DATA COLLECTORS

The data were gathered by Premise data collectors, who are members of the surveyed local communities and who speak their local languages. Premise relies on Facebook and Google ads to recruit its networks of enumerators (data collectors) that they refer to as "contributors." Contributors with relevant previous experience who scored highest on pre-tests of eligibility were assigned supervisor status. In addition, Premise uses various offline tools to develop its networks and recruit contributors. On-site community engagement managers in each country use printed flyers and

postcards, radio commercials, television commercials, sponsorship campaigns, and partnerships with local small businesses to recruit contributors. These efforts were tailored to the given cultural contexts of the country and communities in which they operate. Premise groups also developed organically through word of mouth. Once contributors heard about Premise and downloaded the app, they created a Premise account using email or Facebook and were integrated via demographic surveys. Once they completed this process, they were able to accomplish the tasks assigned by Premise. To be considered a contributor to an advanced task such as a household survey, potential contributors had to pass a series of tests (see Training Data Collectors below).

## DATA COLLECTION

Premise and the MIHR research team ensured that data contributors had a copy of a letter from the regional *Provinciales de la Santé* (DPS) and from MIHR authorizing them to conduct the survey. Prior to the start of data collection, a MIHR research team member met with administrators from the DPS, the district Central Office of the Health Zones (*Bureau Central de la Zone de Santé*, or BCZ[1]), and the village to ensure they were aware of the investigation. All data collectors were instructed to follow COVID-19 prevention guidelines, including wearing masks, practicing social distancing, and using hand sanitizer between interviews.

Once data contributors accepted the interview task, they were assigned a route from which households were systematically chosen to be included in the survey. Data contributors ensured the eligibility of each participant (i.e., the primary female caregiver of a child under 2 years of age) before engaging in a verbal consent process. Data collection began only after verbal consent was obtained. Surveys lasted approximately 30 minutes each. Data contributors conducted 5-7 surveys per day, depending on distance between households. The data collection lasted approximately three weeks. The data were collected using smartphones with pre-programmed surveys in local languages.

**Figure 3. Map of Health Zones in North Kivu**


[1] The DPS and BCZs are both jurisdictions under the national Ministry of Health.

## STUDY LOCATION

Study locations included randomly selected villages in the catchment areas of the 60 MIHR-supported health facilities (across 10 health zones) in North Kivu. The health zones included Beni, Mabalako, Butembo, Kalunguta, Katwa, Nyirangongo, Rutshuru, and Rwanguba (Figure 3).

## STUDY POPULATION AND SAMPLING

The eligible study population included all children under 2 years of age and their respective primary female caregivers (18 years or older) in the catchment areas of MIHR-supported facilities. Questions about eligible children were asked of their primary female caregiver. A sampling frame of the villages covered by the MIHR-supported institutions and their population estimates was constructed from data received from ministry officials in each facility's health zone.

### SAMPLE SIZE

The sample size was calculated to produce an estimate of point prevalence at baseline and to measure changes over time. An overall sample of 1,150 children was calculated using a standard sample size formula for cluster random sampling that also considers a design effect of 1.5. The sample size was designed to measure a 10 percent change in point prevalence over time for key nutrition indicators. As the survey was designed to measure multiple indicators, 50 percent was defined as the initial estimate of prevalence to produce the largest sample size.

### SAMPLING FRAME

The survey followed a two-stage sampling design. The first step was to select 60 clusters by probability proportional to size from a list of villages included in the MIHR catchment areas. Before the selection of households in the second stage, the villages were geolocated and the routes within these villages were created for investigators to track. Village locations (geo coordinates) were obtained via health facility catchment area maps and through enumerator mapping. The coordinates were used as starting points with the creation of geospatial routes through the village. For sampling households in the second stage, the interviewer was provided with the starting point and a route through the cluster. A reference house was randomly selected, and then the closest house next to the reference house chosen as the first respondent (if eligible).

Once a house was located, the data collector determined whether the household had a child under the age of 2 and if they could be included in the sample. If there was more than one child under the age of 2 per mother/female caregiver in the household, the data collector asked the participant to choose a color, blue or red, that was assigned by the interviewer to the child (participant was blinded to the color assignment). If a child under the age of 2 was not found in the household, the investigator moved on to the next home, until a child under the age of 2 was located. If a respondent reported emancipated minor status (under 18 but married), the interviewer was directed to confirm the status by viewing official documentation (e.g., marriage license).

## DATA MANAGEMENT

Premise closely monitored the completion and quality of questionnaires daily through submissions as well as daily telephone communication with contributors and supervisors. Premise used multi-layered quality control and fraud prevention detection to ensure the highest possible levels of data quality. Different submission review protocols were implemented depending on the type of information collected from the contributor. For example, responses were subject to an automated quality control process that searched each submission for GPS emulators and fake GPS, the appropriate time spent on tasks, button overwriting, and multiple accounts on a single device. If a user was found to be in violation of Premise's Terms of Service, their account was suspended, and the data submitted were deleted from the relevant datasets.

## DATA ANALYSIS

Data were analyzed using Stata 17. Descriptive analyses and graph methods summarized data using prevalence and frequencies. Knowledge, attitudes, and practices were stratified by health zone and key demographics. Chi-square test statistics were computed to test for differences by stratifications. Additional analyses (logistic and linear regression models) were conducted to assess the relationship between demographics and key KAPs. All models controlled for caregiver's age, literacy, gender of the child, and clustering at the village level. Gender of the child was included as a control variable because of the documented association between mothers' involvement in household decision-making, gender of the child, and gender gaps in child health outcomes (Dasgupta, 2016) and decisions about family planning (Haughton, 1998). The results of some of these analyses can be found in Appendix 1.

## DISSEMINATION

Results of the KAP were shared at a one-day workshop held in Goma, the project's North Kivu regional hub. Workshop participants included key stakeholders from MIHR, the DPS, BCZs, PRONANUT (the national government nutrition division in DRC), the health and nutrition clusters, WHO, and the World Food Program (WFP). Participants assisted in interpreting results and provided recommendations for addressing child health and nutrition challenges in eastern DRC. A brief workshop report was written documenting the workshop and recommendations.

## ETHICAL CONSIDERATIONS AND INFORMED CONSENT

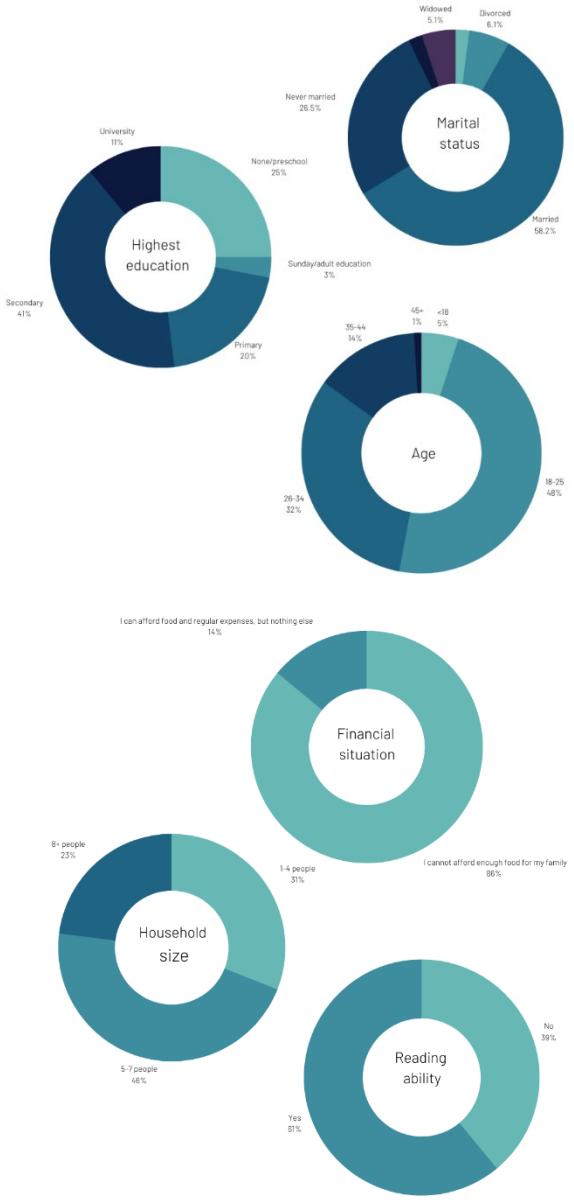
Ethical permission was granted by the Université Libre des Pays des Grands Lacs in Goma and the John Snow, Inc. (JSI) Research Ethics Boards. The DRC DPS/MOH also provided administrative approval for the study. All potential respondents were asked to provide verbal informed consent prior to participation.

# IV. FINDINGS

Most respondents came from the health zones of Katwa (30 percent) and Beni (24 percent), followed by Rutshuru (13 percent) and Nyiragongo (11 percent). The response rate was very high (99 percent).

The majority of respondents were between the ages of 18-25 years (48 percent) and 26-34 years (32 percent). Most women reported secondary schooling as the highest level of education obtained (54 percent) and nearly two-thirds reported they could read an entire sentence (in Swahili) or part of it (61 percent). Most women reported that they did not have enough money to provide food for their family (86 percent) and most households consisted of five to 7 persons (47 percent) (Figure 4).

**Figure 4. Primary Caregiver Demographics**




The majority of children included in the survey were between 1 and 11 months of age (Table 3).

**Table 3. Child Age, by Health Zone**

| Health Zone | < 1 month, N(%) | 1-11 months, N(%) | 12-23 months, N(%) | Total children |
|---|---|---|---|---|
| **Overall** | 88 (10.1) | 527 (60.6) | 255 (29.3) | 870 |
| **Beni** | 22 (11.6) | 122 (56.7) | 68 (31.6) | 212 |
| **Butembo** | 1 (2.0) | 32 (65.3) | 16 (32.7) | 49 |
| **Kalunguta** | 5 (15.2) | 23 (69.7) | 5 (15.2) | 33 |
| **Katwa** | 42 (14.8) | 162 (57.2) | 79 (27.9) | 283 |
| **Mabalako** | 3 (5.7) | 36 (67.9) | 14 (26.4) | 53 |
| **Nyiragongo** | 12 (12.4) | 70 (72.2) | 15 (15.5) | 97 |
| **Rutshuru** | 0 (0.0) | 50 (51.0) | 48 (48.9) | 98 |
| **Rwanguba** | 0 (0.0) | 32 (76.2) | 10 (23.8) | 42 |

## CHILD NUTRITION INDICATORS

Exclusive breastfeeding prevalence generally reduced as children increased in age (Figure 5). By the time children were 5 months old, very few were still exclusively breastfed. Minimum meal frequency, minimum acceptable diet, and dietary diversity all generally improved as children increased in age (Figure 6).

**Figure 5. Exclusive Breastfeeding by Age of Child**

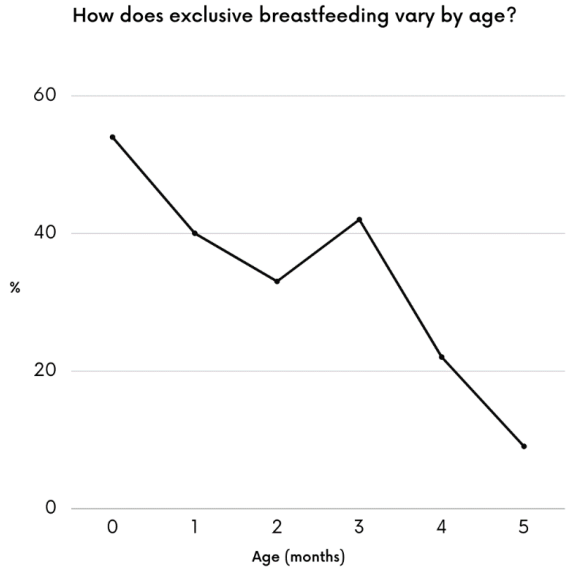
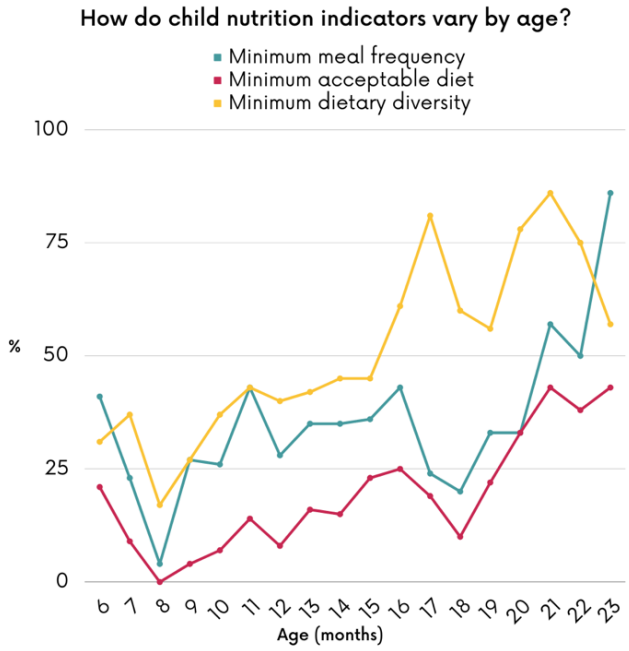
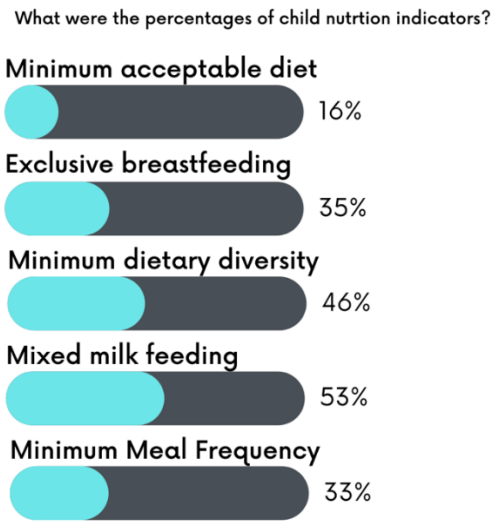


**Figure 6. Child Nutrition by Age of Child**




Approximately 88 percent of all participants reported early initiation of breastfeeding, while 35 percent reported exclusive breastfeeding in the previous day for children under 6 months. Just over half (53 percent) of caregivers reported providing children under 6 months with both breastmilk and at least one other milk source. Most children (89 percent) were introduced to semi-solid foods between 6 and 8 months. Almost half (46 percent) of children 6 to 23 months met the requirements for minimum dietary diversity, while 16 percent had a minimum acceptable diet (Figure 7).

**Figure 7. Child Nutrition Indicators**



### Table 4. Breastfeeding Indicator Comparison with DHS and MICS

| Practice | KAP North Kivu | MICS** National | MICS** North Kivu |
|---|---|---|---|
| Early Initiation Breastfeeding | 86.0% | 46.9% | 73.2% |
| Exclusive Breastfeeding | 35.3% | 53.5% | 83.7% |
| Predominant Breastfeeding*** | 65.2% | 70.4% | 93.2% |

**2017-2018 MICS data.

***Includes those who are exclusively breastfed and given water only and/or non-dairy fluids only.

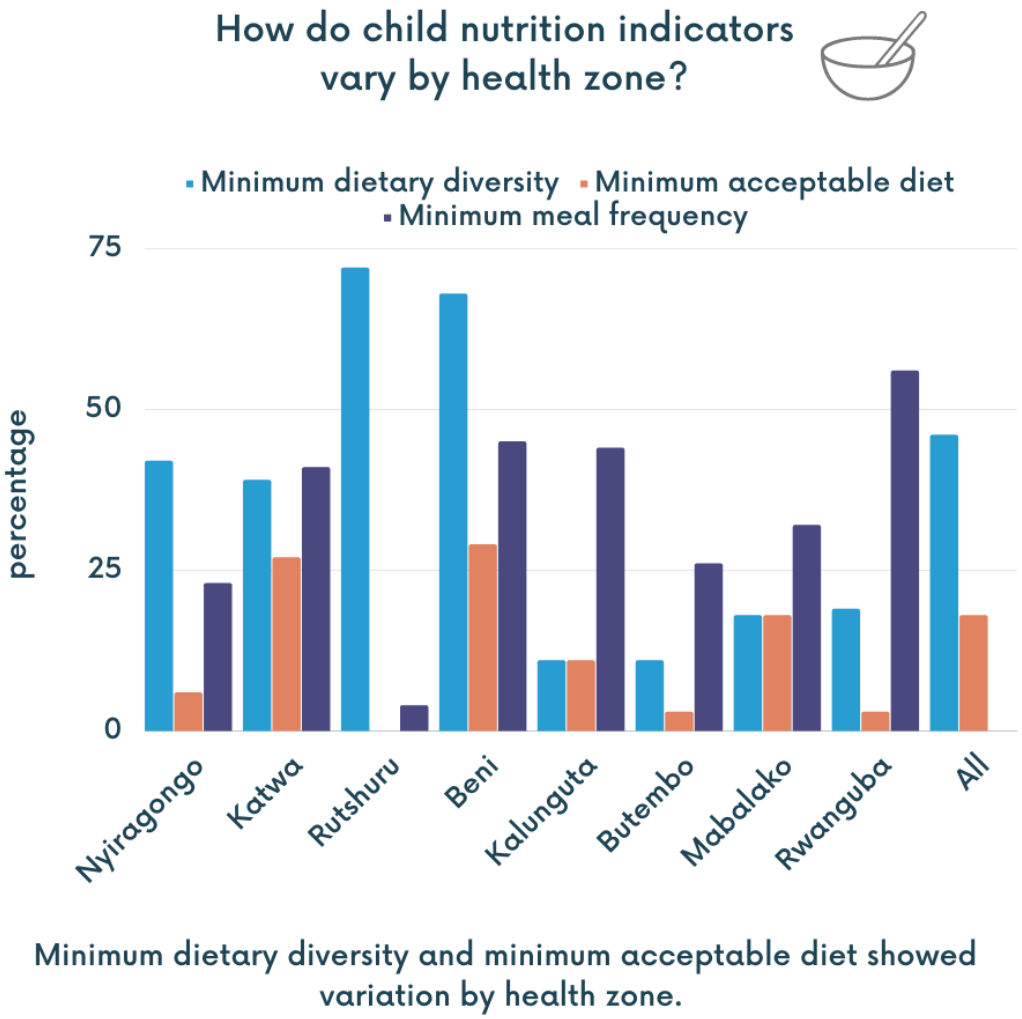
Key child feeding indicators were compared to the most recent MICS (2017-2018) survey to put KAP findings in context of previous national surveys (Table 4). Higher early initiation of breastfeeding reported in the KAP is consistent with the MICS, which found percentages of this indicator to be significantly higher in North Kivu when compared to the rest of the country (MICS, 2018).

Low percentages of exclusive breastfeeding reported in the KAP were inconsistent with previous studies. MICS data report national exclusive breastfeeding (EBF) percentages around 50 percent, with percentages in North Kivu being significantly higher than the national average (84 percent). The low prevalence of EBF in North Kivu found in the MIHR KAP are, thus, perplexing. One possible explanation in the research literature is the impact of the COVID-19 pandemic. Disruptions to routine healthcare; limits on home visits from community health workers; increased demands for child caregiving during lockdowns and school closures; and inconsistent messaging regarding SARS-CoV-2 transmission and the safety of breastfeeding during the pandemic may each partially explain the comparatively lower breastfeeding prevalence in this report (Busch-Hall et al., 2020; Chertok et al., 2022; Latoree et al., 2021). MICS data collection preceded the pandemic by several years. By comparison, KAP data were collected during the pandemic in May 2022. It may be that a combination of COVID-19 and social unrest due to ongoing political conflict impacted breastfeeding practices among KAP respondents.

It is possible that cultural attitudes and societal norms related to breastfeeding were already shifting prior to the pandemic. Wood et al. (2020) conducted focus group discussions with first-time mothers (FTMs) in Kinshasa in late 2017 to explore cultural norms related to exclusive breastfeeding. The authors concluded that norms were not generally supportive of exclusive breastfeeding. Barriers included: the belief held by most FTMs that exclusive breastfeeding was an uncommon practice; wishing to avoid negative consequences such as name-calling and mockery for refusal to give babies water in the first 6 months of life; the desire to please their mothers and friends by meeting expectations related to infant feeding practices; FTMs' own lack of experience with infant feeding; and trust placed in their mothers and friends around infant feeding advice (Wood et al., 2020).

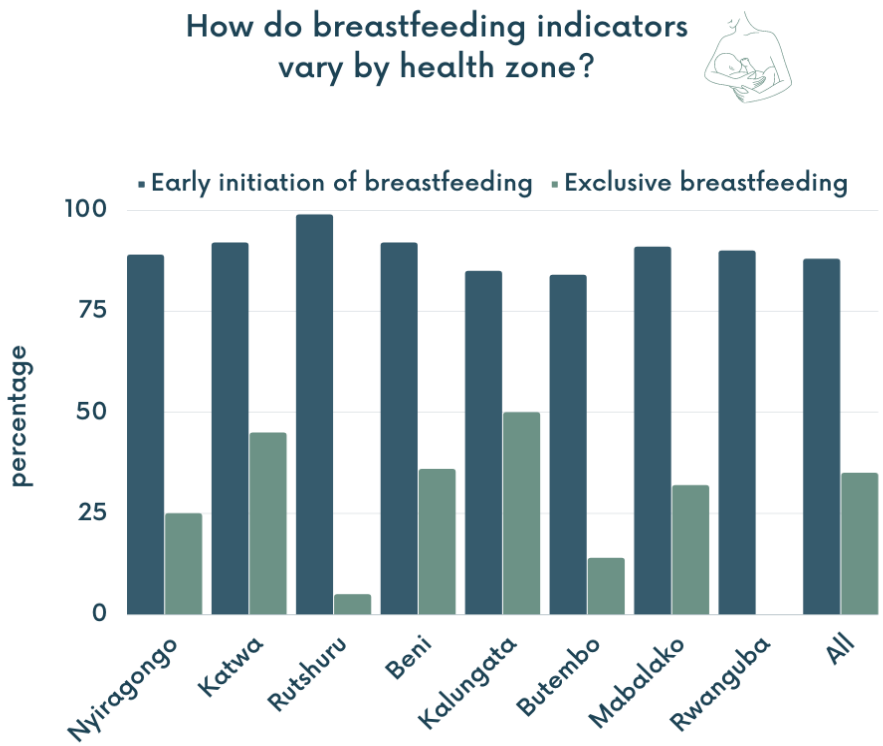
Child nutrition outcomes varied by health zone. Minimum dietary diversity was highest in Rutshuru (72 percent) and Beni (68 percent) and lowest in Kalunguta and Butembo, both around 11 percent. Katwa (27 percent), and Beni (29 percent) had the most children who experienced minimum acceptable diet and Rutshuru (0 percent) and Butembo (3 percent) were lowest (Figure 8). Minimum meal frequency was lowest in Rutshuru (4 percent) and highest in Rwanguba (56 percent), and 33 percent overall.

**Figure 8. Minimum Dietary Diversity and Minimum Acceptable Diet by Health Zone** (by percentage of children meeting the respective minimums)




Nearly all (99 percent) women in Rutshuru initiated breastfeeding in the first hour (lowest in Katwa, 82 percent). Exclusive breastfeeding prevalence was highest in Kalunguta (50 percent) and Katwa (45 percent) and lowest in Rwanguba (0 percent) and Rutshuru (5 percent). Health zones with the highest prevalence of mixed milk feeding were Rwanguba (80 percent) and Rutshuru (68 percent) and the lowest were Kalunguta (38 percent) and Katwa (43 percent) (Figure 9).

**Figure 9. Breastfeeding Indicators by Health Zone**




Early initiation of breastfeeding was high almost everywhere, but exclusive breastfeeding showed variation by health zone.

Dietary diversity varied substantially by health zone for children 6 to 23 months (Table 5). Caregiver age (Table 6) was associated with nutrition indicators. For example, older caregivers (35-44 years of age) were more likely to exclusively breastfeed and to meet minimum dietary diversity and acceptable diet standards than younger caregivers (18-34 years of age). For children under 6 months, very few were given non-liquid foods in the past 24 hours, except for porridge, bread, rice, noodles or pasta (11 percent), and plantains, white potatoes, white yams, manioc, or casava (11 percent). Nearly half of children under 6 months of age were given infant formula in the past 24 hours (46 percent), 39 percent were given water, 13 percent milk from animals, and 13 percent clear broth or soup.

**Table 5. Dietary Recall (24-Hour) for Children (6-23 Months) by Health Zone**

| | Percent Who Consumed What Items in the Past 24 hours | | | | | |
|---|---|---|---|---|---|---|
| **Health Zone** | Grains | Legumes | Dairy | Meat | Eggs | Vitamin A |
| **Beni** | 32.3 | 7.8 | 64.6 | 27.6 | 16.3 | 35.4 |
| **Butembo** | 39.7 | 9.5$^{+}$ | 88.9 | 20.6 | 14.3$^{+}$ | 33.3 |
| **Kalunguta** | 30.4 | 3.6$^{+}$ | 35.7 | 0$^{+}$ | 0$^{+}$ | 16.1$^{+}$ |

| | Percent Who Consumed What Items in the Past 24 hours | | | | | |
|---|---|---|---|---|---|---|
| **Health Zone** | Grains | Legumes | Dairy | Meat | Eggs | Vitamin A |
| **Katwa** | 36.8 | 12.3 | 63.2 | 20.9 | 12.6 | 22.4 |
| **Mabalako** | 27.9 | 0[+] | 69.1 | 5.9[+] | 0[+] | 7.4[+] |
| **Nyiragongo** | 27.1 | 9.3 | 59.3 | 16.9 | 7.6 | 23.7 |
| **Rutshuru** | 66.7 | 48.2 | 94.3 | 59.6 | 33.3 | 68.8 |
| **Rwanguba** | 26.7 | 28.3 | 70 | 51.7 | 1.7[+] | 53.3 |

[+]There were fewer than 10 observations in this cell.

### Table 6. Child Nutrition Indicators by Caregiver Age

| | Caregiver Age | | | | | |
|---|---|---|---|---|---|---|
| **Indicator** | <18 | 18-25 | 26-34 | 35-44 | ≥45 | **Total** |
| Exclusive breastfeeding [1*] | 41.9% | 36.6% | 24.6% | 50.8% | 0% | 35.2% |
| Mixed milk feeding [1] | 48.5% | 50.5% | 60.8% | 44.1% | 100% | 52.9% |
| Minimum dietary diversity[2*] | 80%[+] | 45.3% | 40.1% | 56.9% | 50%[+] | 46% |
| Minimum acceptable diet [2*] | 20%[+] | 15.1% | 11.6% | 31% | 0%[+] | 16.1% |

[1] Under 6 months | [2] 5+ Food Groups out of 8, children 6-23 months | * p < .05 | [+]Fewer than 10 observations in this cell

Reading ability (Table 7) and education level (Table 8) were also associated with several nutritional outcomes. In general, nutrition indicators improved with increased education levels.

### Table 7. Child Nutrition Indicators (Percentage) by Reading Ability

| | Able to Read (%) | | |
|---|---|---|---|
| | No | Yes | Total |
| Exclusive breastfeeding [1*] | 38.6 | 33.5 | 35.3 |
| Mixed milk feeding [1] | 50 | 54.7 | 53 |
| Minimum dietary diversity [2**] | 63.2 | 37.4 | 45.8 |
| Minimum acceptable diet [2] | 16.9 | 16 | 16.3 |

[1] Under 6 months | [2] 5+ Food Groups out of 8, children 6-23 months | * p < .05, ** p < .01

### Table 8. Child Nutrition Indicators (Percentage) by Highest Level of Education Obtained

| | Highest Level of Education Obtained | | | | | | |
|---|---|---|---|---|---|---|---|
| | None | Preschool | Sunday/ Adult Education | Primary | Secondary | University | Total |
| Exclusive breastfeeding[1] | 38.9 | 66.7[+] | 63.6[+] | 31.4 | 34.8 | 30.9 | 35.6 |
| Mixed milk feeding[1**] | 50.0 | 0[+] | 8.3[+] | 50 | 54.9 | 63.2 | 52.6 |
| Minimum dietary diversity[2] | 52.5 | 75[+] | 40.9[+] | 53.7 | 37.4 | 49 | 45.3 |
| Minimum acceptable diet[2*] | 28.8 | 0[+] | 22.7[+] | 9.5[+] | 15.9 | 13.7[+] | 16.2 |

[1] Under 6 months | [2] 5+ Food Groups out of 8, children 6-23 months | * p < .05, ** p < .01 | [+]Fewer than 10 observations in this cell

Logistic regression was also used to examine the association between select socioeconomic variables and child nutrition outcomes. Larger households were associated with higher rates of early initiation of breastfeeding (Odds Ratio [OR]: 1.36), while ability to read well was associated with lower rates of early initiation of breastfeeding (OR: 0.39). Having a female child under 2 was associated with exclusive breastfeeding (OR: 3.76). Larger households were associated with meeting minimum dietary diversity for children (OR: 1.56) while ability to read well was associated with not meeting the standard for minimum dietary diversity (OR: 0.39). None of the measured socioeconomic variables were significantly associated with minimum acceptable diet.

## FEMALE CAREGIVER NUTRITION

More than two-thirds (69 percent) of female caregivers had consumed foods from at least five different food groups in the previous 24 hours, meeting the definition of achieving minimum dietary diversity (Table 9). Women from Rutshuru (82 percent), Katwa (73 percent), and Beni (73 percent) had the highest prevalence of dietary diversity while Rwanguba (42 percent) and Kalunguta (39 percent) had the lowest dietary diversity scores. Dietary diversity was highest for respondents who were able to read and those with a secondary level of education. Minimum dietary diversity did not vary significantly by age (Table 9), but did by reading ability (Table 10) and education level (Table 11), with higher levels of education associated with improved minimum dietary diversity.

### Table 9. Female Caregiver Nutrition by Age

| | **Caregiver Age** | | | | | |
|---|---|---|---|---|---|---|
| | <18 | 18-25 | 26-34 | 35-44 | ≥45 | Total |
| Minimum dietary diversity[1] | 61.8% | 69.8% | 66.9% | 76.2% | 72.7%[+] | 69.4% |

[1]5+ food groups out of 7- all caregivers | [+]Fewer than 10 observations in this cell

### Table 10. Caregiver Nutrition by Reading Ability

| | **Able to Read** | | |
|---|---|---|---|
| | No | Yes | Total |
| Minimum dietary diversity[1]* | 65.3% | 71.5% | 69.1% |

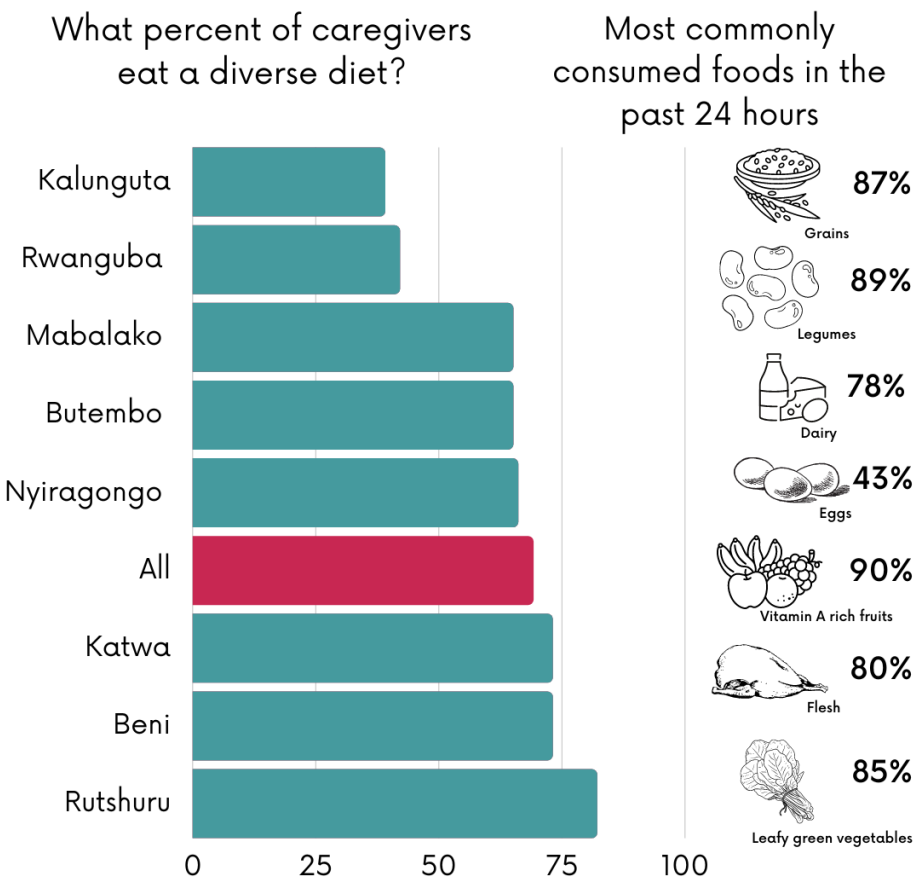
[1] 5+ food groups out of 7- all caregivers; * p < .05

### Table 11. Caregiver Nutrition by Highest Level of Education Obtained

| | **Highest Level of Education Obtained** (percent) | | | | | | |
|---|---|---|---|---|---|---|---|
| | None | Preschool | Sunday/ Adult Education | Primary | Secondary | University | Total |
| Minimum dietary diversity[1]*** | 57.0 | 80.0[+] | 62.2 | 75.8 | 69.7 | 81.7 | 69.1 |

[1] 5+ food groups out of 7- all caregivers; *** p < .001 | [+]Fewer than 10 observations in this cell

**Figure 10. Percentage of Female Caregivers Achieving Minimum Dietary Diversity by Health Zone and Most Common Food Choices**




Women from Rutshuru were mostly likely to have the greatest dietary diversity (Figure 10), while specific food group consumption varied by location (Table 12). Vitamin A foods, legumes, and grains were the most commonly consumed foods.

**Table 12. Dietary Recall (24-Hour) for Caregivers by Health Zone**

| | Percent Who Consumed These Items in Past 24 hours | | | | | |
|---|---|---|---|---|---|---|
| **Health Zone** | Grains | Legumes | Dairy | Meat | Eggs | Vitamin A |
| **Beni** | 78.2 | 94.6 | 50.9 | 86.4 | 32.7 | 94.9 |
| **Butembo** | 98.4 | 82.5 | 23.8 | 79.4 | 60.3 | 80.9 |
| **Kalunguta** | 94.5 | 94.6 | 28.6 | 41.1 | 26.8 | 85.7 |
| **Katwa** | 93.6 | 90.8 | 52.5 | 77.3 | 51.8 | 89.9 |
| **Mabalako** | 76.5 | 79.4 | 44.1 | 85.3 | 42.7 | 98.5 |
| **Nyiragongo** | 67.8 | 95.8 | 32.2 | 88.1 | 35.6 | 95.8 |
| **Rutshuru** | 98.6 | 88.7 | 53.2 | 89.4 | 53.2 | 90.1 |
| **Rwanguba** | 93.3 | 73.3 | 50 | 66.7 | 21.7 | 55 |

## HOUSEHOLD DECISION-MAKING

Most women (88 percent) reported at least some involvement in intra-household decision-making (Table 13). With respect to decisions about household food and use of modern contraception, about half make those decisions alone (47 percent and 49 percent, respectively). This contrasts with decisions about healthcare, where only 22 percent of women make decisions alone, and 17 percent make decisions alone about what to do when a child falls sick. Decisions about having another child were mostly made jointly between the respondent and partner (33 percent) or the husband/partner alone (34 percent).

### Table 13. Female Caregiver Involvement in Household Decisions

| | **Who in Your Household Makes Decisions About the Following:** (percent) | | | | |
|---|---|---|---|---|---|
| **Decider** | Food distribution | Health care | Sick child | Having Another child | Modern contraception use |
| Decision not made/not applicable | 1.7 | 1.7 | 4.6 | 1.8 | 1.3 |
| Husband/Partner alone | 20.1 | 32.1 | 30.0 | 33.6 | 17.8 |
| Respondent and husband/partner jointly | 20.4 | 30.7 | 30.9 | 32.8 | 21.1 |
| Respondent and someone else jointly | 4.7 | 8.1 | 8.5 | 6.9 | 2.8 |
| Respondent alone | 46.7 | 22.1 | 17.2 | 17.3 | 48.6 |
| Someone else (e.g., mother-in law, traditional healer) alone | 6.0 | 4.6 | 7.8 | 2.7 | 0.6[+] |

[+]Fewer than 10 observations in this cell.

Decision-making varied significantly by age (Table 14), reading ability (Table 15), and education level (Table 16). In general, older age and higher levels of education were associated with increased caregiver involvement in decision-making.

### Table 14. Female Caregiver Involvement in Household Decisions by Age

| | **Caregiver Age** (percent) | | | | | |
|---|---|---|---|---|---|---|
| **Decision** | <18 | 18-25 | 26-34 | 35-44 | ≥45 | Total |
| Food distribution*** | 56.4 | 65.8 | 81.8 | 77.6 | 90.9 | 72.3 |
| Healthcare*** | 45.5 | 45.7 | 66.9 | 74.2 | 90.9 | 56.8 |
| Sick child*** | 47.3 | 43.7 | 55.4 | 71.4 | 72.7[+] | 51.7 |
| Another child*** | 47.3 | 43.3 | 59.8 | 74.2 | 81.8[+] | 53.4 |
| Modern contraception*** | 65.5 | 65.6 | 79.5 | 73.5 | 63.6[+] | 71.1 |

*Note*: Decision-making refers to any involvement by caregiver, independently or shared, in household decision-making.
*** p < .001 | [+]Fewer than 10 observations in this cell

### Table 15. Caregiver Involvement in Household Decisions by Reading Ability

| | **Able to Read** (percent) | | |
|---|---|---|---|
| **Decision** | No | Yes | Total |
| Food distribution | 69.7 | 73.0 | 71.7 |
| Healthcare*** | 68.1 | 50.2 | 57.1 |
| Sick child*** | 70.9 | 40.2 | 52.2 |
| Another child*** | 70.5 | 43.4 | 53.9 |
| Modern contraception** | 76.8 | 67.9 | 71.4 |

*Note*: Decision-making refers to any involvement by caregiver, independently or shared, in household decision-making.
** p < .01, *** p < .001

### Table 16. Caregiver Involvement in Household Decisions by Highest Level of Education Obtained

| | **Highest Level of Education Obtained** (percent) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Decision** | None | Preschool | Sunday/ Adult Education | Primary | Secondary | University | Total |
| Food distribution* | 69.7 | 90⁺ | 70.3 | 69.9 | 69.7 | 86.1 | 71.1 |
| Healthcare*** | 66.5 | 90⁺ | 56.8 | 55.7 | 48.9 | 67.8 | 57.1 |
| Sick child*** | 70.9 | 80⁺ | 54.1 | 54.8 | 38.3 | 55.7 | 52.0 |
| Another child*** | 70.5 | 90⁺ | 62.2 | 49.3 | 41.5 | 65.2 | 53.5 |
| Modern contraception*** | 76.5 | 90⁺ | 70.3 | 69.9 | 65.0 | 88.7 | 71.6 |

*Note*: Decision-making refers to any involvement by female caregiver, independently or shared, in household decision-making.
* p < .05, ** p < .01, *** p < .001; | ⁺Fewer than 10 observations in this cell

Decision-making varied across health zones (Figure 11). For example, Katwa and Kalunguta reported the highest levels of respondent participation in decision-making (either jointly or alone) around how much food each household member receives, while Beni and Mabalako had the highest levels of respondent participation in decision-making around contraception. Mabalako had the highest average decision-making score (3.4) while Butembo had the lowest (1.6) (Table 17).

**Figure 11. Female Caregiver Involvement in Household Decision-Making by Health Zone**

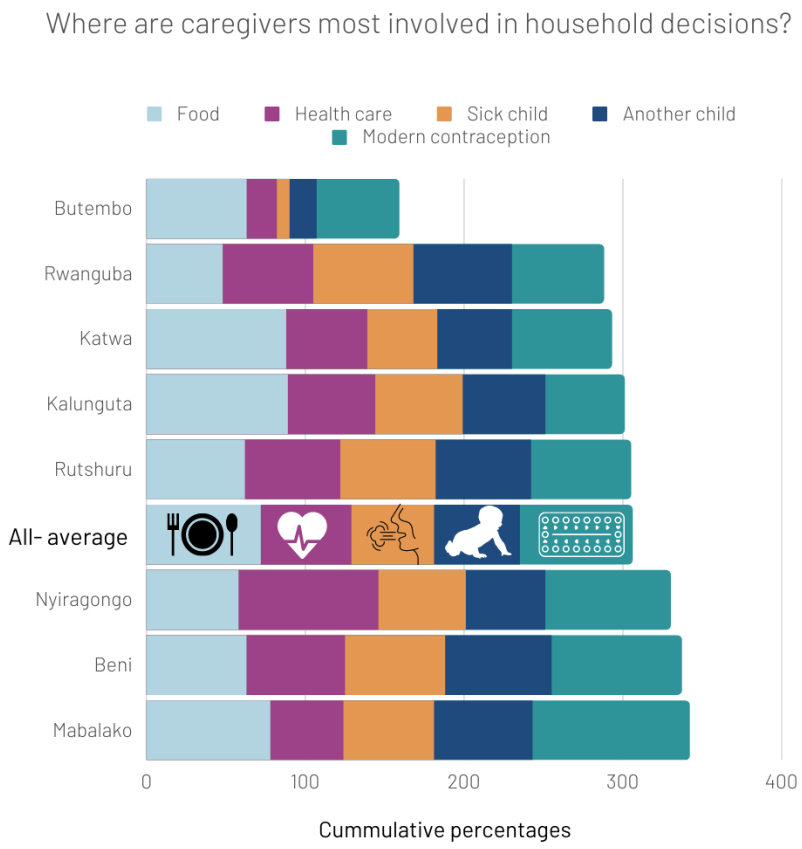



**Table 17. Average Decision-Making Score by Health Zone**

| Health Zone | N | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| **Beni** | 257 | 3.4 | 1.7 | 0 | 5 |
| **Butembo** | 63 | 1.6 | 1.5 | 0 | 5 |
| **Kalunguta** | 56 | 3.1 | 1.6 | 0 | 5 |
| **Katwa** | 326 | 3.0 | 1.5 | 0 | 5 |
| **Mabalako** | 68 | 3.4 | 1.4 | 1 | 5 |
| **Nyiragongo** | 118 | 3.3 | 1.4 | 1 | 5 |
| **Rutshuru** | 141 | 3.0 | 2.4 | 0 | 5 |
| **Rwanguba** | 60 | 2.9 | 2.1 | 0 | 5 |

Ability to read well was associated with lower decision-making scores, while female children and older caregivers were associated with higher decision-making scores.

## FAMILY PLANNING

Only 14 percent of women used a family method during their postpartum period (Table 18). Younger and less-educated caregivers had the lowest prevalence. Some of the caregiver respondents were not the child's biological mother. Of female primary caregivers that were the child's aunt (n = 128), 23 percent used an FP method. Sisters (n = 136) reported 18 percent, and stepmothers (n = 28) 64 percent. By comparison, biological mothers (n = 781) reported a prevalence of use of 12 percent. Testing for statistical significance in FP method use between different categories of female caregivers (e.g., biological mother versus stepmother) was not possible due to small sample sizes in some of the categories.

Age (Table 18), reading ability (Table 19), and level of education (Table 20) were all significantly associated with use of an FP method. For example, older female caregivers were more likely to use family planning than younger caregivers.

### Table 18. Use of Family Planning by Biological Mother Female Caregiver Age

| | Caregiver Age | | | | | |
|---|---|---|---|---|---|---|
| | <18 | 18-25 | 26-34 | 35-44 | ≥45 | Total |
| Used family planning during the postpartum*** | 10.9%⁺ | 9.8% | 14.6% | 31% | 25%⁺ | 14.4% |

*** p < .001 | ⁺Fewer than 10 observations in this cell

### Table 19. Use of Family Planning by Reading Ability

| | Able to Read | | |
|---|---|---|---|
| | No | Yes | Total |
| Used family planning during the postpartum*** | 8.6% | 19.8% | 15.5% |

*** p < .001

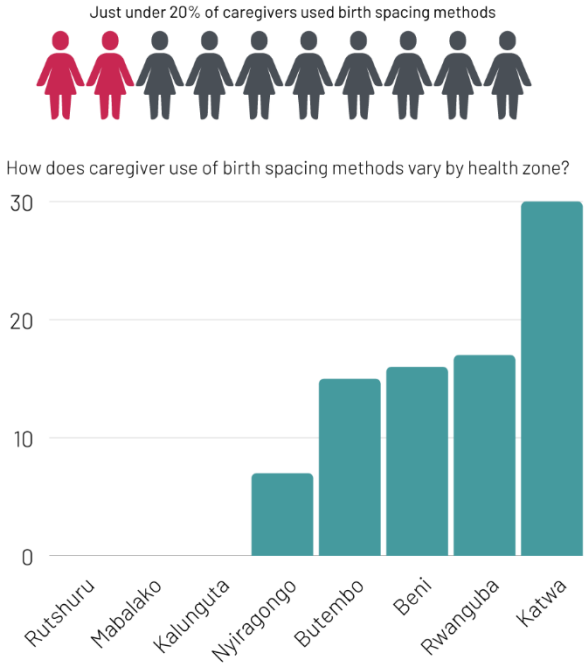
### Table 20. Use of Family Planning by Highest Level of Education Obtained

| | Highest Level of Education Obtained | | | | | | |
|---|---|---|---|---|---|---|---|
| | None | Preschool | Sunday/ Adult Education | Primary | Secondary | University | Total |
| Used family planning method during the postpartum*** | 5% | 20%⁺ | 47.2% | 10.9% | 18.5% | 22.8% | 15.3% |

*** p < .001 | ⁺Fewer than 10 observations in this cell

Katwa (30 percent), Rwanguba (17 percent), and Beni (17 percent) had the highest reported use of family planning (Figure 12).

**Figure 12. Caregiver Use of Family Planning Method by Health Zone**

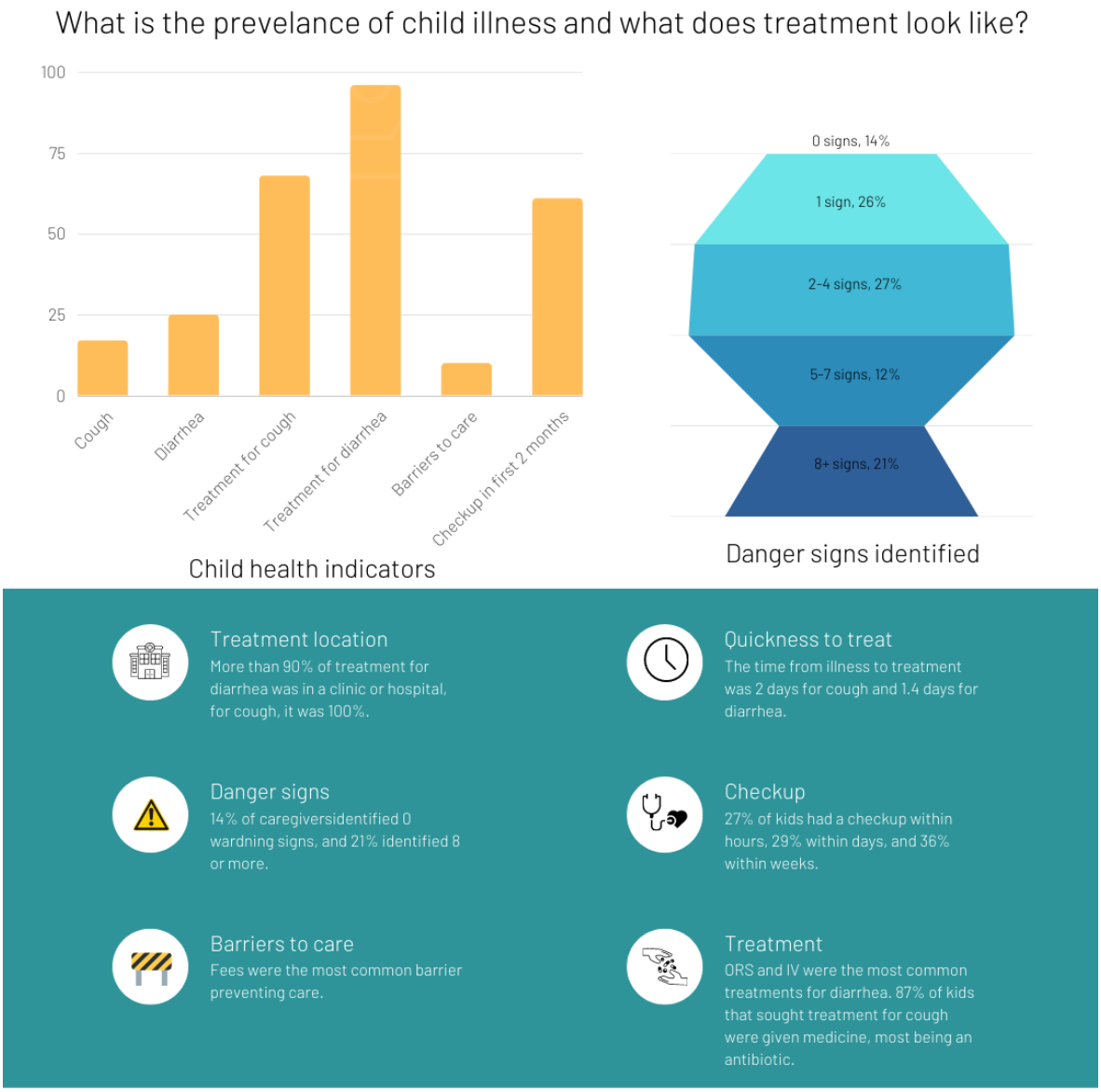



## CHILDHOOD ILLNESS AND POSTNATAL CARE

Approximately 17 percent of children experienced a cough and fast breathing in the 2 weeks preceding the survey. Of those, 68 percent of caregivers reported seeking advice or treatment for the cough and fast breathing. Nearly one-quarter (24 percent) of all children reported diarrhea in the 2 weeks preceding the survey, and nearly all (96 percent) respondents sought treatment for children with diarrhea symptoms. All but 2 percent of treatment for diarrhea was sought in a hospital or health center (Figure 13).

Few caregivers (10 percent) reported any barriers to care. More than half (53 percent) were able to identify at least three danger signs representing threats to the health of newborns. Most caregivers (61 percent) reported that their child received at least one check-up in the first 2 months of life and 56 percent said that happened within hours of birth. Doctors were the most frequently reported person conducting postnatal check-ups, followed by nurses or midwives, and community health workers (*Relais Communautaire* or RECOs). Less than 4 percent of check-ups were conducted in someone else's or the respondent's own home, with the rest being done in a health center or hospital.

**Figure 13. Childhood Illness Prevalence and Treatment**




Rates of coughing and fast/difficult breathing were highest in Nyiragongo (29 percent) while Butembo (62 percent) had the most reported cases of diarrhea (Figure 14).

**Figure 14. Childhood Illness Indicators by Health Zone**


*Note on Figure 14:* There was no cough and fast/difficult breathing reported in Kalungut.; Advice for cough and fast/difficult breathing in Kalunguta was not applicable. There was no advice sought for cough and fast/difficult breathing reported in Mabalako.

Child health indicators were often significantly associated with age (Table 21) and level of education (Table 22). For example, reported cases of diarrhea trended downwards as age increased, while knowledge of how to use oral rehydration solution (ORS) trended upwards with age.

## Table 21. Child Health and Illness Indicators by Caregiver Age

| | **Caregiver Age** (percent) | | | | | |
|---|---|---|---|---|---|---|
| | <18 | 18-25 | 26-34 | 35-44 | ≥45 | **Total** |
| **Knows how to prepare ORS*** ** | 50.0+ | 55.0 | 88.6 | 68.4 | 50.0+ | 67.2 |
| **Cough and fast breathing[1]** | 10.9+ | 15.5 | 19.1 | 15.0 | 9.1+ | 16.3 |
| **Diarrhea*** ** | 7.3+ | 28.9 | 25.8 | 12.9 | 18.2+ | 24.5 |
| **Treatment for cough** | 50.0+ | 78.6 | 59.4 | 57.1+ | 0.0+ | 68.6 |
| **Treatment for diarrhea** ** | 75.0+ | 97.3 | 95.5 | 94.7 | 50.0+ | 95.8 |
| **Barriers to treatment** | 10.9+ | 9.8 | 11.1 | 10.3 | 9.1+ | 10.3 |
| **How many danger signs identified*** ** | | | | | | |
| *Group 1 (0 signs identified)* | 40.0 | 13.0 | 11.7 | 12.9 | 27.3+ | 14.1 |
| *Group 2 (1 sign identified)* | 47.3 | 25.7 | 19.4 | 36.7 | 36.4+ | 26.4 |
| *Group 3 (2-4 signs identified)* | 5.5+ | 31.3 | 27.6 | 20.4 | 0.0+ | 27.0 |
| *Group 4 (5-7 signs identified)* | 5.5+ | 9.5 | 13.2 | 20.4 | 36.4+ | 12.2 |
| *Group 5 (8 or more signs identified)* | 1.8+ | 20.5 | 28.2 | 9.5 | 0.0+ | 20.3 |
| **Healthcare provider check in first 2 months*** ** | 23.6 | 61.7 | 67.7 | 55.8 | 63.6+ | 60.1 |
| **Time from birth to first checkup*** ** | | | | | | |
| *Don't know* | 0.0+ | 4.7 | 11.3 | 15.9 | 0.0+ | 8.3 |
| *Hours* | 69.2+ | 34.5 | 15.2 | 29.3 | 14.3+ | 27.5 |
| *Days* | 15.4+ | 29.8 | 28.1 | 28.1 | 28.6+ | 28.7 |
| *Weeks* | 15.4+ | 31.0 | 45.5 | 26.8 | 57.1+ | 35.6 |

* p < .05, ** p < .01, *** p < .001 | +Fewer than 10 observations in this cell

## Table 22. Child Health and Illness Indicators by Highest Level of Education Obtained

| | **Highest Level of Education Obtained** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | None | Pre | Sunday/ Adult Education | Primary | Secondary | University | Total |
| **Knows how to prepare ORS*** ** | 28.6+ | 0.0+ | 100.0 | 52.1 | 69.4 | 93.9 | 67.9 |
| **Cough and fast breathing *** ** | 7.6 | 10.0+ | 29.7 | 13.7 | 22.2 | 18.3 | 16.8 |
| **Diarrhea*** ** | 5.6 | 20.0+ | 29.7 | 22.0 | 35.9 | 28.7 | 24.9 |
| **Treatment for cough** | 100.0+ | 0.0+ | 66.7+ | 78.3 | 66.7 | 53.9+ | 67.9 |
| **Treatment for diarrhea*** ** | 71.4 | 100.0+ | 100.0 | 100.0 | 96.3 | 97.0 | 95.9 |
| **Barriers to treatment** | 13.8 | 10.0+ | 13.9+ | 11.6 | 8.8 | 6.1+ | 10.4 |
| **How many danger signs identified*** ** | | | | | | | |
| *Group 1 (0 signs identified)* | 23.9 | 30.0+ | 2.7+ | 19.6 | 6.3 | 11.3 | 13.7 |
| *Group 2 (1 sign identified)* | 54.2 | 40.0+ | 24.3+ | 26.0 | 15.0 | 8.7 | 26.3 |
| *Group 3 (2-4 signs identified)* | 9.6 | 10.0+ | 24.3+ | 29.7 | 35.0 | 29.6 | 26.8 |
| *Group 4 (5-7 signs identified)* | 7.2 | 20.0+ | 29.7 | 7.3 | 14.4 | 20.0 | 12.4 |
| *Group 5 (8 or more signs identified)* | 5.2 | 0.0+ | 18.9+ | 17.4 | 29.4 | 30.4 | 20.8 |
| **Health care provider check in first 2 months*** ** | 21.1 | 50.0+ | 67.6 | 57.1 | 80.9 | 80.0 | 61.3 |
| **Time from birth to first checkup*** ** | | | | | | | |
| *Don't know* | 11.3+ | 0.0+ | 0.0+ | 3.2+ | 8.6 | 12.0 | 7.9 |
| *Hours* | 28.3 | 20.0+ | 24.0+ | 31.2 | 30.8 | 6.5+ | 26.9 |

| | Highest Level of Education Obtained | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | None | Pre | Sunday/ Adult Education | Primary | Secondary | University | Total |
| *Days* | 30.2 | 40.0+ | 16.0+ | 26.4 | 30.2 | 29.4 | 28.9 |
| *Weeks* | 30.2 | 40.0+ | 60.0 | 39.2 | 30.5 | 52.2 | 36.3 |

* p < .05, ** p < .01, *** p < .001

+Fewer than 10 observations in this cell

# V. CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

The primary purpose of this study was to examine KAPs around maternal and child health in North Kivu, DRC. Baseline results indicate the prevalence of key child nutrition indicators varied greatly across health zones. For example, exclusive breastfeeding was 50 percent in Kalunguta but under 10 percent in three health zones (Rutshuru, Beni, and Rwanguba). These percentages are each lower than the DRC's national exclusive breastfeeding percentage (54 percent) based upon 2017 MICS results (INS, 2018). Similarly, minimum dietary diversity was highest in Rutshuru (72 percent) and Beni (68 percent), while it was under 20 percent in four other zones (Nyiragongo, Kalunguta, Butembo, Mabalako). By comparison, the DRC's national minimum dietary diversity prevalence was only 18 percent in 2017 (INS, 2018). A recent study on minimum dietary diversity in North Kivu found a prevalence of 26 percent (George, 2022). Mixed milk feeding (53 percent) prevalence found in the current study was similar to that reported nationally (50 percent) in the 2017 MICS (INS, 2018).

While higher than child dietary diversity, maternal dietary diversity varied substantially by health zone as well, ranging from 39 percent in Kalunguta to 82 percent in Rutshuru. Caregiver age was associated with nutrition indicators. For example, older caregivers (35-44 years) were more likely to exclusively breastfeed and to meet minimum dietary diversity and acceptable diet standards than younger caregivers (18-34 years).

Shared decision-making varied by both health zone and decision type. Women reported the most shared decision-making around food and modern contraception choices. Relatively few women had access to family planning services, a finding consistent with MICS data showing only 18 percent of women using modern contraceptive methods, with 72 percent of women using no birth spacing method at all (INS, 2018). Diarrhea was the most common (24 percent) ailment among children under 2 years and varied greatly by health zone. Women from Butembo reported 62 percent of children experiencing diarrhea in the previous 2 weeks, compared to 3 percent of children in Beni. Incidence rates reported here are consistent with recent research from the DRC reporting childhood diarrhea rates of 33 percent (George, 2021).

An assessment of the association between study outcomes and demographic characteristics showed that larger households often predicted positive health outcomes. Unexpectedly, ability to read well was frequently associated with negative outcomes. Whereas this finding may appear counterintuitive, it does align with other previously published literature. In a meta-analysis of studies on exclusive

breastfeeding in Ethiopia, Habtewold et al. (2021) reported an inverse relationship with education such that exclusive breastfeeding decreased with increasing education. In a few cases, having a female child and older caregiver age were more likely to be associated with positive outcomes. For example, having a female child and older caregiver age were associated with higher decision-making scores. The finding related to increased age and involvement in household decisions corroborates previous research on rural women in Nepal, where age and autonomy were positively associated (Archaya et al., 2010). In the current study, higher decision-making scores were positively associated with maternal and child health.

These results give important insight into KAPs in North Kivu, revealing the diversity of outcomes throughout this region, the infrequent use of family planning, and the importance of shared decision-making to health.

## RECOMMENDATIONS

Findings from this study support the need for projects to address low prevalence of exclusive breast feeding and dietary diversity among children and use of FP methods in North Kivu.

Communities could benefit from programs designed to improve household breastfeeding and nutrition practices (e.g., exclusive breastfeeding, decreased mixed feeding, minimum meal frequency and dietary diversity). Key stakeholders at the KAP results dissemination workshop recommended infant and young child feeding (IYCF) support groups and social and behavior change (SBC) programming aimed at promoting breastfeeding and disputing myths around exclusive breastfeeding to address these challenges. Specifically, data from the study suggest that programs aimed at improving complementary feeding from 6-12 months are in greatest need. Further, programs aimed at increasing the use of FP and education for mothers about newborn danger signs are needed. Findings suggest programs that simultaneously work to improve caregiver decision-making opportunities could also improve maternal and child health outcomes. Lastly, programs should also account for potentially large differences in key health outcomes between communities and should use flexibility to steer program resources to communities and topics of greatest need.

## REFERENCES


Acharya, D. R., Bell, J. S., Simkhada, P., Van Teijlingen, E. R., & Regmi, P. R. 2010. "Women's autonomy in household decision-making: a demographic study in Nepal." *Reproductive Health*, *7*(1):1-12.

Bapolisi, W. A., Ferrari, G., Bisimwa, G., & Merten, S. 2021. "Gendered determinants of food insecurity in ongoing regional conflicts, North and South Kivu, the Democratic Republic of Congo." *Agriculture & Food Security*, *10*(1):1-9.

Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., De Onis, M., Ezzati, M., & Maternal and Child Undernutrition Study Group. 2008. "Maternal and child undernutrition: Global and regional exposures and health consequences." *The Lancet*, *371*(9608):243-260.

Burns, J., Emerson, J. A., Amundson, K., Doocy, S., Caulfield, L. E., & Klemm, R. D. 2016. "A qualitative analysis of barriers and facilitators to optimal breastfeeding and complementary feeding practices in South Kivu, Democratic Republic of Congo." *Food and Nutrition Bulletin*, *37*(2):119-131.

Busch-Hallen, J., Walters, D., Rowe, S., Chowdhury, A., & Arabi, M. 2020. "Impact of COVID-19 on maternal and child health." *The Lancet Global Health*, *8*(10):e1257.

Carlson, G. J., Kordas, K., & Murray-Kolb, L. E. 2015). "Associations between women's autonomy and child nutritional status: a review of the literature." *Maternal & Child Nutrition*, *11*(4):452-482.

Chertok, I. A., Artzi-Medvedik, R., Arendt, M., Sacks, E., Otelea, M. R., Rodrigues, C., & Mariani, I. 2022. "Factors associated with exclusive breastfeeding at discharge during the COVID-19 pandemic in 17 WHO European Region countries." *International Breastfeeding Journal*, *17*(1):83.

Cunningham, K., Ruel, M., Ferguson, E., & Uauy, R. 2015. "Women's empowerment and child nutritional status in South Asia: A synthesis of the literature." *Maternal & Child Nutrition*, *11*(1): 1-19.

Dasgupta, S. 2016. "Son preference and gender gaps in child nutrition: Does the level of female autonomy matter?" *Review of Development Economics*, *20*(2):375-386.

Demographic and Health Survey. 2014. "Democratic Republic of Congo 2013-4: Key findings." Rockville, Maryland, USA: MPSMRM, MSP and ICF International. https://dhsprogram.com/pubs/pdf/SR218/SR218.e.pdf.

Dharmalingam, A., Navaneetham, K., & Krishnakumar, C. S. 2010. "Nutritional status of mothers and low birth weight in India." *Maternal and Child Health Journal*, *14*(2):290-298.

George, C.M., Cirhuza, L.B., Birindwa, A., Williams, C., Beck, S., Julian, T., & François, R. 2021. "Child hand contamination is associated with subsequent pediatric diarrhea in rural Democratic Republic of the Congo (REDUCE Program)." *Tropical Medicine & International Health*, *26*(1):102-110.

George, C. M., Coglianese, N., Bauler, S., Perin, J., Kuhl, J., Williams, C., & Cirhuza, L. B. 2022. "Low dietary diversity is associated with linear growth faltering and subsequent adverse child developmental outcomes in rural Democratic Republic of the Congo (REDUCE program)." *Maternal & Child Nutrition*, *18:*e13340. https://doi.org/10.1111/mcn.13340.

Habtewold, T. D., Endalamaw, A., Mohammed, S. H., Mulugeta, H., Dessie, G., Kassa, G. M., & Alemu, S. M. 2021. "Sociodemographic factors predicting exclusive breastfeeding in Ethiopia: Evidence from

a meta-analysis of studies conducted in the past 10 years." *Maternal and Child Health Journal*, *25*(1):72-94.

Haughton, J., & Haughton, D. 1998. "Are simple tests of son preference useful? An evaluation using data from Vietnam." *Journal of Population Economics*, *11*(4):495-516.

Integrated Food Security Phase (IFSP). "Democratic Republic of the Congo: Acute food insecurity situation July - December 2022 and Projection for January - June 2023." https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155972/?iso3=COD.

Institut National de la Statistique (INS). 2019. "Enquête par grappes à indicateurs multiples, 2017-2018, rapport de résultats de l'enquête. " Kinshasa, République Démocratique du Congo. https://www.unicef.org/drcongo/media/3646/file/COD-MICS-Palu-2018.pdf.

Latorre, G., Martinelli, D., Guida, P., Masi, E., De Benedictis, R., & Maggio, L. 2021. "Impact of COVID-19 pandemic lockdown on exclusive breastfeeding in non-infected mothers." *International Breastfeeding Journal*, *16*:1-7.

McKenna, C. G., Bartels, S. A., Pablo, L. A., & Walker, M. 2019. "Women's decision-making power and undernutrition in their children under age five in the Democratic Republic of the Congo: A cross-sectional study." *PloS one*, *14*(12):e0226041.

Semaan, A., Audet, C., Huysmans, E., Afolabi, B., Assarag, B., Banke-Thomas, A., & Benova, L. 2020. "Voices from the frontline: findings from a thematic analysis of a rapid online global survey of maternal and newborn health professionals facing the COVID-19 pandemic." *BMJ Global Health*, *5*(6):e002967.

Shafiq, A., Hussain, A., Asif, M., Hwang, J., Jameel, A., & Kanwel, S. 2019. "The effect of "women's empowerment" on child nutritional status in Pakistan." *International Journal of Environmental Research and Public Health*, *16*(22):4499.

Slegh, H., Barker, G., & Levtov, R. 2014. Gender relations, sexual and gender-based violence and the effects of conflict on women and men in north Kivu, eastern Democratic Republic of the Congo: Results from the International Men and Gender Equality Survey (IMAGES)." Promundo-US. https://promundo.org.br/wp-content/uploads/2014/12/Gender-Relations-Sexual-and-Gender-Based-Violence-and-the-Effects-of-Conflict-on-Women-and-Men-in-North-Kivu-Eastern-DRC-Results-from-IMAGES.pdf.

UNICEF. 2013. "Improving child nutrition: The achievable imperative for global progress." https://data.unicef.org/resources/improving-child-nutrition-the-achievable-imperative-for-global-progress/.

Wood, F. E., Gage, A. J., & Bidashimwa, D. 2020. "Insights on exclusive breastfeeding norms in Kinshasa: findings from a qualitative study." *BMC pregnancy and childbirth*, *20*(1): 1-14.

World Health Organization. 1997. "WHO global data base on child growth and malnutrition." https://apps.who.int/iris/bitstream/handle/10665/63750/WHO_NUT_97.4.pdf. jsessionid=3C983CF6E7FB0C9922CCFC682A1B6243?sequence=1.

# APPENDIX 1. SUPPLEMENTARY RESULTS

**Table 23. Factors Associated with Early Initiation of Breastfeeding**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | 1.362 | .211 | 2.00 | .046 | 1.006 | 1.844 | ** |
| Can read | .391 | .106 | -3.46 | .001 | .23 | .665 | *** |
| Male child | 1.221 | .271 | 0.90 | .368 | .79 | 1.886 | |
| Caregiver age | 1.218 | .191 | 1.26 | .209 | .895 | 1.657 | |
| Constant | 7.608 | 2.175 | 7.10 | 0 | 4.345 | 13.324 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.879 | SD dependent var | 0.327 |
| Pseudo r-squared | 0.040 | Number of obs | 849 |
| Chi-square | 19.014 | Prob > chi2 | 0.001 |
| Akaike crit. (AIC) | 612.656 | Bayesian crit. (BIC) | 636.376 |

*** p<.01, ** p<.05, * p<.1

**Table 4. Factors Associated with Exclusive Breastfeeding**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | .819 | .155 | -1.05 | .292 | .564 | 1.188 | |
| Can read | 1.516 | .502 | 1.26 | .209 | .792 | 2.903 | |
| Male child | 1.715 | .38 | 2.43 | .015 | 1.111 | 2.649 | ** |
| Caregiver age | 1.388 | .2 | 2.28 | .023 | 1.047 | 1.841 | ** |
| Constant | .127 | .045 | -5.77 | 0 | .063 | .255 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.240 | SD dependent var | 0.427 |
| Pseudo r-squared | 0.034 | Number of obs | 430 |
| Chi-square | 15.697 | Prob > chi2 | 0.003 |
| Akaike crit. (AIC) | 467.175 | Bayesian crit. (BIC) | 487.494 |

*** p<.01, ** p<.05, * p<.1

**Table 5. Factors Associated with Minimum Diet Diversity, Child**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | 1.561 | .268 | 2.59 | .01 | 1.114 | 2.186 | *** |
| Can read | .394 | .096 | -3.80 | 0 | .244 | .637 | *** |
| Male child | 1.132 | .225 | 0.63 | .531 | .768 | 1.671 | |
| Caregiver age | .896 | .134 | -0.73 | .464 | .669 | 1.202 | |
| Constant | 1.222 | .397 | 0.62 | .537 | .646 | 2.312 | |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.459 | SD dependent var | 0.499 |
| Pseudo r-squared | 0.061 | Number of obs | 407 |
| Chi-square | 23.739 | Prob > chi2 | 0.000 |
| Akaike crit. (AIC) | 537.208 | Bayesian crit. (BIC) | 557.252 |

*** p<.01, ** p<.05, * p<.1

**Table 6. Factors Associated with Minimum Acceptable Diet, Child**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | .959 | .22 | -0.18 | .855 | .612 | 1.503 | |
| Can read | .865 | .264 | -0.48 | .634 | .476 | 1.572 | |
| Male child | .919 | .251 | -0.31 | .757 | .538 | 1.569 | |
| Caregiver age | 1.35 | .277 | 1.46 | .143 | .903 | 2.018 | |
| Constant | .138 | .064 | -4.27 | 0 | .056 | .343 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.162 | SD dependent var | 0.369 |
| Pseudo r-squared | 0.009 | Number of obs | 407 |
| Chi-square | 2.593 | Prob > chi2 | 0.628 |
| Akaike crit. (AIC) | 367.687 | Bayesian crit. (BIC) | 387.731 |

*** p<.01, ** p<.05, * p<.1

**Table 27. Factors Associated with Minimum Diet Diversity, Caregiver**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | 1.02 | .103 | 0.20 | .841 | .838 | 1.243 | |
| Can read | 1.326 | .199 | 1.88 | .06 | .989 | 1.78 | * |
| Male child | 1.04 | .129 | 0.32 | .75 | .816 | 1.326 | |
| Caregiver age | 1.089 | .095 | 0.98 | .329 | .918 | 1.291 | |
| Constant | 1.64 | .292 | 2.77 | .006 | 1.156 | 2.326 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.696 | SD dependent var | 0.460 |
| Pseudo r-squared | 0.005 | Number of obs | 1064 |
| Chi-square | 5.968 | Prob > chi2 | 0.202 |
| Akaike crit. (AIC) | 1310.332 | Bayesian crit. (BIC) | 1335.181 |

*** p<.01, ** p<.05, * p<.1

**Table 28. Factors Associated with Caregiver Involvement in Household Decision Making**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | -.013 | .084 | -0.15 | .881 | -.179 | .154 | |
| Can read | -.946 | .135 | -7.04 | 0 | -1.211 | -.682 | *** |
| Male child | .263 | .103 | 2.56 | .011 | .061 | .465 | ** |
| Caregiver age | .563 | .074 | 7.57 | 0 | .416 | .709 | *** |
| Constant | 2.643 | .143 | 18.45 | 0 | 2.361 | 2.925 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 3.054 | SD dependent var | 1.754 |
| R-squared | 0.131 | Number of obs | 1064 |
| F-test | 25.178 | Prob > F | 0.000 |
| Akaike crit. (AIC) | 4075.424 | Bayesian crit. (BIC) | 4100.273 |

*** p<.01, ** p<.05, * p<.1

**Table 29. Factors Associated with Access to or Use of Family Planning**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | .811 | .126 | -1.35 | .177 | .598 | 1.099 | |
| Can read | 2.33 | .576 | 3.43 | .001 | 1.436 | 3.781 | *** |
| Male child | .966 | .148 | -0.22 | .823 | .716 | 1.304 | |
| Caregiver age | 1.914 | .234 | 5.32 | 0 | 1.507 | 2.431 | *** |
| Constant | .038 | .012 | -10.33 | 0 | .02 | .07 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.142 | SD dependent var | 0.350 |
| Pseudo r-squared | 0.060 | Number of obs | 1039 |
| Chi-square | 37.039 | Prob > chi2 | 0.000 |
| Akaike crit. (AIC) | 809.431 | Bayesian crit. (BIC) | 834.161 |

*** p<.01, ** p<.05, * p<.1

**Table 30. Factors associated with Having a Cough or Difficult or Fast Breathing in the past 2 Weeks**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | 1.008 | .132 | 0.06 | .951 | .78 | 1.302 | |
| Can read | 2.871 | .606 | 5.00 | 0 | 1.899 | 4.341 | *** |
| Male child | .931 | .145 | -0.46 | .646 | .686 | 1.264 | |
| Caregiver age | .983 | .108 | -0.16 | .874 | .792 | 1.219 | |
| Constant | .096 | .024 | -9.25 | 0 | .058 | .158 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.159 | SD dependent var | 0.366 |
| Pseudo r-squared | 0.033 | Number of obs | 1064 |
| Chi-square | 26.444 | Prob > chi2 | 0.000 |
| Akaike crit. (AIC) | 910.579 | Bayesian crit. (BIC) | 935.428 |

*** p<.01, ** p<.05, * p<.1

**Table 31. Factors Associated with Having Diarrhea in the Past 2 Weeks**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | .589 | .078 | -4.00 | 0 | .454 | .763 | *** |
| Can read | 8.548 | 2.095 | 8.76 | 0 | 5.288 | 13.818 | *** |
| Male child | .977 | .146 | -0.16 | .875 | .729 | 1.308 | |
| Caregiver age | .854 | .104 | -1.30 | .194 | .673 | 1.083 | |
| Constant | .13 | .033 | -7.98 | 0 | .079 | .215 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.246 | SD dependent var | 0.431 |
| Pseudo r-squared | 0.152 | Number of obs | 1063 |
| Chi-square | 96.867 | Prob > chi2 | 0.000 |
| Akaike crit. (AIC) | 1014.848 | Bayesian crit. (BIC) | 1039.692 |

*** p<.01, ** p<.05, * p<.1

**Table 32. Factors Associated with Being Able to Identify Danger Signs in Newborn**

| | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Number in household | -.352 | .054 | -6.45 | 0 | -.459 | -.244 | *** |
| Can read | 1.297 | .095 | 13.61 | 0 | 1.109 | 1.485 | *** |
| Male child | -.082 | .065 | -1.27 | .204 | -.21 | .045 | |
| Caregiver age | .144 | .045 | 3.19 | .002 | .055 | .232 | *** |
| Constant | 1.327 | .087 | 15.20 | 0 | 1.155 | 1.499 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 1.985 | SD dependent var | 1.330 |
| R-squared | 0.308 | Number of obs | 1064 |
| F-test | 64.387 | Prob > F | 0.000 |
| Akaike crit. (AIC) | 3242.767 | Bayesian crit. (BIC) | 3267.616 |

*** p<.01, ** p<.05, * p<.1

**Table 33. The Association Between Caregiver Involvement in Household Decision Making and Outcomes of Interest[1]**

| Outcome | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Exclusive breastfeeding | 1.185 | .117 | 1.71 | .087 | .976 | 1.439 | * |
| Early Initiation of breastfeeding | .977 | .064 | -0.36 | .721 | .859 | 1.111 | |
| Minimum diet diversity | 1.367 | .102 | 4.20 | 0 | 1.182 | 1.582 | *** |
| Minimum acceptable diet, child | .99 | .082 | -0.12 | .908 | .841 | 1.166 | |
| Minimum diet diversity, caregiver | 1.178 | .051 | 3.77 | 0 | 1.082 | 1.282 | *** |
| Family planning | 1.019 | .058 | 0.33 | .743 | .911 | 1.139 | |
| Cough | .825 | .043 | -3.72 | 0 | .745 | .913 | *** |
| Diarrhea | .756 | .033 | -6.44 | 0 | .694 | .823 | *** |
| Knowledge of danger signs | .793 | .069 | -2.68 | .007 | .669 | .939 | *** |

[1]Each row represents the model estimates of a unique logistic regression model comprised of the specified outcome as the dependent variable and decision making as the independent variable. Models control for number of members in the household, literacy level of primary caregiver, gender of child, and primary caregiver age.

*** p<.01, ** p<.05, * p<.1

# APPENDIX 2. SURVEY QUESTIONNAIRE

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 1 | Please travel to the shaded area indicated on the map, you must stay within this area for the entire duration of the task. All interviews need to take place within the shaded area | SELECT_ONE | | Continue | No |
| 2 | For this task we are ONLY interested in interviewing primary female caretakers of children under the age of 24 months (2 years) | SELECT_ONE | | Continue | No |
| 3 | Please confirm that the woman you are interviewing is a caretaker of a child under the age of 2 years before starting the interview, if you fail to do so you will not be paid for that interview. | SELECT_ONE | | Continue | No |
| 4 | Please also confirm that the caretaker is willing to be interviewed before starting the interview, not doing so will result in not being paid for that interview. | | | | |
| 5 | You will be asked to interview 4 female caretakers of children under the age of 2. You will be paid for each interview you successfully complete. In order to submit the task and earn the full task price you must successfully complete ALL interviews. | SELECT_ONE | | Continue | No |
| 6 | If you have covered the entire shaded area and have not found 4 female caretakers of children under the age of 2 that are willing to be interviewed, please record "There are no more female caretakers in the shaded area" to the question following the consent statement. ONLY do this if you are certain there are no more caretakers in the area willing to be interviewed. | SELECT_ONE | | Continue | |
| 7 | Reminder, read questions and response options out loud to the caretaker EXACTLY as they are written in the task, if a question starts with "DO NOT SAY" you do not need to read that question out loud and you should read answer the question on your own. | SELECT_ONE | | Continue | |
| 5 | Introduction script - description of project and data collection | SELECT_ONE | | Continue | No |
| 6 | Consent statement | SELECT_ONE | | I have read the consent statement out loud | No |
| 7 | If you have any questions or concerns about this data collection you can contact Jocelyne Tshongo at +243975425313 | SELECT_ONE | Please write this information down if you would like to contact her | Continue | |
| 8 | DO NOT SAY: Did the interviewee consent to this interview? | SELECT_ONE | | Yes the interviewee consentedNo the interviewee did not consent There are no more female caretakers in the shaded area | |
| 9 | Record Location | GEOPOINT | | | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 10 | DO NOT SAY: Please read the following questions out loud to the interviewee exactly as they are written and record their answers. Please also read the hint text providing more details about the questions. Record only the answers provided by the interviewee | SELECT_ONE | Only record the answers given by the interviewee, do not answer for them or based on your opinions. | Ok, I understand | Yes |
| 11 | I am going to read the following questions, and response options out loud to you as they are written. Please wait to answer until I have read out loud the entire question and answer options. | SELECT_ONE | | Ok, I understand | Yes |
| 12 | How old are you (the caregiver)? | NUMBER | Please enter the mothers age in years | | Yes |
| 13 | Have you ever attended school? | SELECT_ONE | | Yes No | Yes |
| 14 | What is the highest level of school you attained? | SELECT_ONE | | Preschool<br>Primary<br>Intermediate Secondary<br>Adult Education<br>University/Higher institutions<br>Khalwa/Sunday Education | Yes |
| 15 | DO NOT SAY: For the following question, show the sentance to the caretaker and ask them to read it out loud to you. If they cannot read the whole sentance, ask if they can read part of the sentance to you. | SELECT_ONE | | Continue | Yes |
| 16 | SHOW SENTENCE TO RESPONDENT. “I eat vegetables” | SELECT_ONE | | Continue | Yes |
| 17 | DO NOT SAY: Was the caretaker able to read the sentance out loud to you? | SELECT_ONE | | Cannot read at all<br>Able to read only parts of sentence Able to read whole sentence | Yes |
| 18 | What is your current marital status? | SELECT_ONE | | Never married<br>Married<br>Widowed<br>Divorced<br>Seperated<br>Cohabited/living together | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options |
|---|---|---|---|---|
| 19 | Who in your household makes the decision of whether or not to use a modern contraception method? | SELECT_ONE | For example oral contraceptives, condoms, IUDs | Respondent alone<br>Husband/Partner alone<br>Respondent & Husband/Partner jointly<br>Someone else (example- Mother-in law, traditional practitioner/healer) alone<br>Respondent & someone else jointly<br>Decision not made/not applicable |
| 20 | Who in your household makes the decision of whether to have another child? | SELECT_ONE | | Respondent alone<br>Husband/Partner alone<br>Respondent & Husband/Partner jointly<br>Someone else (example- Mother-in law, traditional practitioner/healer) alone<br>Respondent & someone else jointly<br>Decision not made/not applicable |
| 21 | Who in your household makes the decision of what to do if a child falls sick? | SELECT_ONE | | Respondent alone<br>Husband/Partner alone<br>Respondent & Husband/Partner jointly<br>Someone else (example- Mother-in law, traditional practitioner/healer) alone<br>Respondent & someone else jointly<br>Decision not made/not applicable |
| 22 | Who in your household makes the decisions on your own healthcare? | SELECT_ONE | For example ANC, FP/RH, routine services | Respondent alone<br>Husband/Partner alone<br>Respondent & Husband/Partner jointly<br>Someone else (example- Mother-in law, traditional practitioner/healer) alone<br>Respondent & someone else jointly<br>Decision not made/not applicable |
| | Who in your household makes the decisions on how much of each food type (meat, vegetables, grains, dairy) each member of the household receives at each meal? | SELECT ONE | | Respondent alone<br>Husband/Partner alone<br>Respondent & Husband/Partner jointly<br>Someone else (example- Mother-in law, traditional practitioner/healer) alone |

| # | Question | Question Type | Hint (Text and/or image) | Response Options |
|---|---|---|---|---|
| | | | | Respondent & someone else jointly Decision not made/not applicable |
| 23 | The following questions will ask about all foods and drinks you (the caretaker) consumed in the past 24 hours, starting when you woke the previous day, through the day, and overnight. | SELECT_ONE | | Continue |
| 24 | This includes all foods and drinks consumed at meal time, in between meals, and both inside and outside the home. | SELECT_ONE | | Ok, I understand |
| 25 | Some dishes contain multiple ingredients. You should only count the main ingredients when answering the following questions. | SELECT_ONE | Do not count ingredients in mixed dishes that are used in small quantities to flavor a dish | Ok, I understand |
| 26 | Although items like bread may have small amounts of dairy, eggs, fats, orl or some cheese, nuts or fruit, bread should be classified by its primary ingredient which is grains. | SELECT_ONE | | Ok, I understand |
| 27 | Before we begin, think about all of the foods and beverages you consumed in the past 24 hours. | SELECT_ONE | Consider meals and snacks as well as things consumed in the home and out of home. | Continue |
| 28 | In the past 24 hours, did you consume foods made from grains? | SELECT_ONE | | Yes No |
| 29 | In the past 24 hours, did you consume white roots, tubers, or plaintains? | SELECT_ONE | | Yes No |
| 30 | In the past 24 hours, did you consume beans, peas, or lentils? | SELECT_ONE | | Yes No |
| 31 | In the past 24 hours, did you consume nuts or seeds. | SELECT_ONE | | Yes No |
| 32 | In the past 24 hours, did you consume milk or milk products? | SELECT_ONE | | Yes No |
| 33 | In the past 24 hours, did you consume organ meat? | SELECT_ONE | | Yes No |
| 34 | In the past 24 hours, did you consume meat or poultry? | SELECT_ONE | | Yes No |
| 35 | In the past 24 hours, did you consume fish or seafood? | SELECT_ONE | | Yes No |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 36 | In the past 24 hours, did you consume eggs? | SELECT_ONE | | Yes No | Yes |
| 37 | In the past 24 hours, did you consume dark green leafy vegetables? | SELECT_ONE | | Yes No | Yes |
| 38 | In the past 24 hours, did you consume Vitamin A-rich foods (roots and tubers)? | SELECT_ONE | Such as carotte, cassava rouge, red potatoes or rouge | Yes No | Yes |
| 39 | In the past 24 hours, did you consume Vitamin A-rich fruits? | SELECT_ONE | Such as hembe, papaya, cungwa | Yes No | Yes |
| 40 | In the past 24 hours, did you consume other vegetables? | SELECT_ONE | | Yes No | Yes |
| 41 | In the past 24 hours, did you consume other fruits? | SELECT_ONE | | Yes No | Yes |
| 42 | In the past 24 hours, did you consume insects and other small protien foods? | SELECT_ONE | | Yes No | Yes |
| 43 | In the past 24 hours, did you consume red palm oil? | SELECT_ONE | | Yes No | Yes |
| 44 | In the past 24 hours, did you consume other oils and fats? | SELECT_ONE | | Yes No | Yes |
| 45 | In the past 24 hours, did you consume savoury and fried snacks? | SELECT_ONE | | Yes No | Yes |
| 46 | In the past 24 hours, did you consume sweets? | SELECT_ONE | | Yes No | Yes |
| 47 | In the past 24 hours, did you consume sugar-sweetened beverages? | SELECT_ONE | Such as coke or fruit juice. | Yes No | Yes |
| 48 | In the past 24 hours, did you consume condiments or seasonings? | SELECT_ONE | | Yes No | Yes |
| 49 | In the past 24 hours, did you consume other beverages or foods? | SELECT_ONE | | Yes No | Yes |
| 50 | In the past 24 hours, did you consume any mixed dishes that you did not include in the previous questions? | SELECT_ONE | | Yes No | Yes |
| 51 | What were the main ingredients in the mixed dishes that you did not include in the previous questions? | SELECT_MANY | | Foods made from grains White roots, tubers, plantains Beans, peas or lentils Nuts or seeds Milk or milk products Organ meat Meat or poultry Fish or seafood Eggs Dark green leafy vegetables Vitamin-A rich | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | | | | vegetables<br>Vitamin-A rich fruits<br>Other vegetables<br>Other fruits<br>Insects or other small protien Red palm oil<br>Other oils and fats<br>Savoury and fried snacks Sweets<br>Sugar-sweetened beverages<br>Condiments and seasonings | |
| 52 | The following questions will ask you about your youngest child (under the age of 24 months). Please answer all questions for the same child. | SELECT_ONE | | Continue | Yes |
| 53 | What is your child's sex? | SELECT_ONE | | Male<br>Female | Yes |
| 54 | Do you know your child's exact date of birth? | SELECT_ONE | | Yes No | Yes |
| 55 | Please enter the day of your child's birth? | NUMBER | For example, if the child was born on the 1st day of September in 2021 you should enter 1 | | Yes |
| 56 | Please enter your child's month of birth | SELECT_ONE | For example, if the child was born on the 1st day of September in 2021 please select September | January<br>February<br>March<br>April<br>May<br>June July<br>August<br>Septembe r<br>Novembe r<br>December | Yes |
| 57 | Please select the year or your child's birth | SELECT_ONE | For example, if the child was born on the 1st day of September in 2021 please select 2021 | 2019<br>2020<br>2021<br>2022 | Yes |
| 58 | DO NOT SAY: What is the source of the child's date of birth? | SELECT_ONE | | Caretaker response<br>Health Card<br>Other | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 59 | DO NOT SAY: What is the other source of the child's date of birth? | TEXT | | | Yes |
| 60 | For the following question, we are going to ask how many months your child completed, please only include full months. | SELECT_ONE | | Continue | Yes |
| 61 | How many full years has your child completed? | SELECT_ONE | For example, if your child was born in the middle of September and it is the beginning of December, you would enter 1 as they have completed 1 year September to September | 0<br>1 | Yes |
| 62 | How many full months has your child completed? | NUMBER | This should be a number between 0 and 24, please only record full months the child has completed | | Yes |
| 63 | The following questions will ask about what your child consumed directly after birth. | SELECT_ONE | | Ok, I understand | Yes |
| 64 | Was your youngest child ever breastfed? | SELECT_ONE | Breastfeeding occurs when the baby suckles at the mother's breast or consumes milk that had previously been expressed by the mother or another woman | Yes No | Yes |
| 65 | How long after birth was your child first put to the breast? | SELECT_ONE | Meaning when was the baby was given the opportunity to feed at the mother's breast (whether they suckled successfully or not) | Immediately Less than one hour Less than 24 hours More than 24 hours I don't know | Yes |
| 66 | How many hours after birth was your child first put to the breast? | NUMBER | | | Yes |
| 67 | How many days after birth was your child first put to the breast? | NUMBER | | | Yes |
| 68 | In the first 2 days after delivery, was your child given anything other thank breastmilk to eat or drink? Anything at all like water or infant formula | SELECT_ONE | | Yes No | Yes |
| 69 | Was your child breastfed yesterday during the day or at night? | SELECT_ONE | | Yes No<br>I don't know | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 70 | Did your child drink anything from a bottle with a nipple yesterday during the day or at night? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 71 | The following questions will ask you about liquids that your child had yesterday during the day or at night. Please tell me about all drinks, whether your child had them at home, or somewhere else. | SELECT_ONE | Do not include food or drinks that were offered to your child but they did not consume. | Continue | Yes |
| 72 | Yesterday during the day or at night, did your child have plain water? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 73 | Yesterday during the day or at night, did your child have infant formula? | SELECT_ONE | | | Yes |
| 74 | How many times did your child drink formula? | SELECT_ONE | | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7+<br>I don't know | Yes |
| 75 | Yesterday during the day or at night, did your child have milk from animals, such as fresh, tinned or powdered milk? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 76 | How many times did your child drink milk? | SELECT_ONE | | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7+<br>I don't know | Yes |
| 77 | Was the milk or were any of the milk drinks a sweet or flavoured type of milk? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 78 | Yesterday during the day or at night, did your child have yogurt drinks? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 79 | How many times did your child drink yogurt? | SELECT_ONE | | 0-7 times<br>7 or more times I don't know | Yes |
| 80 | Was the yogurt or were any of the yogurt drinks a sweet or flavoured type of yogurt drink? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 81 | Yesterday during the day or at night, did your child have chocolate-flavoured drinks including those made from syrups or powders? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 82 | Yesterday during the day or at night, did your child have fruit juice or fruit-flavoured drinks including those made | SELECT_ONE | | Yes No<br>I don't know | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | from syrups or powders? | | | | |
| 83 | Yesterday during the day or at night, did your child have sodas, malt drinks, sports drinks or energy drinks? | SELECT_ONE | | Yes No I don't know | Yes |
| 84 | Yesterday during the day or at night, did your child have tea, coffee, or herbal drinks? | SELECT_ONE | | Yes No I don't know | Yes |
| 85 | Was the drink/ Were any of these drinks sweetened? | SELECT_ONE | | Yes No I don't know | Yes |
| 86 | Yesterday during the day or at night, did your child have clear broth or clear soup? | SELECT_ONE | | Yes No I don't know | Yes |
| 87 | Yesterday during the day or at night, did your child have any other liquids? | SELECT_ONE | | Yes No I don't know | Yes |
| 88 | What was the liquid or what were the liquids? | TEXT | | | Yes |
| 89 | Was the drink or were any of the drinks sweetened? | SELECT_ONE | | Yes No I don't know | Yes |
| 90 | The following questions will ask you about everything that your child ate yesterday during the day or the night. | SELECT_ONE | Please include foods your child ate at home and away from home as well as snacks, small meals, and main meals. | Continue | Yes |
| 91 | I will ask you about different types of foods, and I would like to know whether your child ate the food even if it was combined with other foods in a mixed dish | SELECT_ONE | Please do not answer "yes" for any food or ingredient used in a small amount to add flavour to a dish. | Continue | Yes |
| 92 | Did your child eat yogurt other than yogurt drinks yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 93 | How many times did your child eat yogurt? | SELECT_ONE | | 0 1 2 3 4 5 6 7+ I don't know | Yes |
| 94 | Did your child eat porridge, bread, rice, noodles, or pasta yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 95 | Did your child eat pumpkin, carrots, sweet peppers, squash, or sweet potatoes that are yellow or orange inside yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 96 | Did your child eat plantains, white potatoes, white yams, manioc, or cassava yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 97 | Did your child eat dark green leafy vegetables such as sakuma wiki yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 98 | Did your child eat any other vegetables yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 99 | Did your child eat ripe mangoes, or ripe papaya yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 100 | Did your child eat any other fruits yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 101 | Did your child eat liver, kidney, or heart yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 102 | Did your child eat sausages, hot dogs, ham, bacon, salami, or canned meat yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 103 | Did your child eat any other meat, such as beef, pork, lamb, goat, chicken, or duck yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 104 | Did your child eat eggs yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 105 | Did your child eat fresh fish, dried fish or shellfish yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 106 | Did your child eat beans, peas, lentils, nuts, or seeds yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 107 | Did your child eat hard or soft cheese yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 108 | Did your child eat sweet foods such as chocolates, candies, pastries, cakes, biscuits, or frozen treats like ice cream and popsicles yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 109 | Did your child eat chips, crips, puffs, french fries, fried dough, or instant noodles yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 110 | Did your child eat other solid, semi-solid, or soft foods yesterday during the day or the night? | SELECT_ONE | | Yes No I don't know | Yes |
| 111 | What other solid, semi-solid or soft foods did your child eat yesterday during the day or night? | TEXT | | | Yes |
| 112 | How many times did your child eat any solid, semi-solid or soft foods yesterday during the day or night? | SELECT_ONE | 0 1 2 3 4 5 6 7+ I don't know | Continue | Yes |
| 113 | The following questions will ask about your child's health directly after birth. | SELECT_ONE | | Yes No | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 114 | In the 2 months after your child was born, did any health care provider check on their health? | SELECT_ONE | | I don't know | Yes |
| 115 | How long after birth did the first check take place? | SELECT_ONE | | Hours<br>Days<br>Weeks<br>I don't know | Yes |
| 116 | How many hours after birth did the first check take place? | NUMBER | Please enter the number of hours. | | Yes |
| 117 | How many days after birth did the first check take place? | NUMBER | Please enter the number of days. | | Yes |
| 118 | How many weeks after birth did the first check take place? | NUMBER | Please enter the number of weeks. | Doctor<br>Clinical Officer<br>Nurse/Mid wife | Yes |
| 119 | Who checked on your child's health at that time? | SELECT_MANY | | Traditional Birth Attendant<br>Community Health Worker Other | Yes |
| 120 | Who else checked on your child's health at that time? | TEXT | Please select all that apply and probe the interviewee "Did anyone else check on their health?" | I don't know | Yes |
| 121 | Where did the first check of your child take place? | SELECT_ONE | | Your home<br>Someone else's home<br>Government Hospital<br>Government Clinic or Health Centre<br>Government Health Post<br>Mission hospital or clinic Other public health facility Private hospital<br>Private clinic<br>Private maternity home<br>Other private health facility | Yes |
| 122 | What is the name of the place where the birth took place? | TEXT | | | Yes |
| 123 | What other public government health facility did the birth take place at? | TEXT | | | Yes |
| 124 | What other private government health facility did the birth take place at? | TEXT | Please select all that apply and probe the interviewee "Anything else?" | Examine their cord<br>Counsel you on danger signs for newborns<br>Asses their temperature<br>Counsel you on | Yes |
| 125 | During the first two days after birth, did any health care provider do the following for your child? | SELECT_MANY | | | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | | | | breastfeeding and observe breastfeeding<br>Weigh your child<br>Identification and referral of illness<br>Education on home care for sick infants/newborns<br>Education on hygiene, hand washing and sanitation<br>None of the above | |
| 126 | What are some serious health problems that can occur during the first 7 days after birth that could endanger the life of a newborn baby? | SELECT_MANY | Please select all that apply and probe the interviewee "Anything else?" | Difficult or fast breathing<br>Yellow skin/eye color (jaundice) Poor sucking or feeding<br>Pus, bleeding, or discharge from around the umbilical cord<br>Baby very small<br>Skin lesions or blisters<br>Convulsions/spasms /rigidity<br>Lethargy/unconsciousness Red or swollen eyes with pus Baby appears blue<br>Baby feels cold<br>Fever or baby feels cold Unable to breastfeed<br>Other<br>None<br>Don't know | Yes |
| 127 | What other serious health problems that can occur during the first 7 days after birth that could endanger the life of a newborn baby? | TEXT | | | Yes |
| 128 | Did you have access to or have you used a birth spacing/family planning method during the postpartum period? (first 6- weeks following delivery | SELECT_ONE | | Yes No | Yes |
| 129 | Can you tell me the method you accessed or used? | SELECT_MANY | Please select ALL that apply | Female sterilization<br>Male sterilization<br>Implant<br>Intramuscular injectable-depo)<br>Injectable | Yes |
| 130 | DO NOT READ: What other method of birth control was mentioned? | TEXT | | | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | | | | subcutaneous (Sayana Press)<br>Pill<br>IUD<br>Diaphragm<br>Female condom<br>Male condom<br>Foam/Gel<br>Lactational amenorrhea (exclusive breastfeeding)<br>Rhythm Abstinence<br>Withdrawal Other | |
| 131 | The following questions will ask about your child's recent health. | SELECT_ONE | | Continue<br>Yes<br>No<br>I don't know | Yes |
| 132 | Has this child or any other child under 5 years in this house had Diarrhea in the last 2 weeks? | SELECT_ONE | | Yes No<br>I don't know | Yes |
| 133 | Has this or any other child under 5 years in your household experienced cough and fast/difficult breathing in the last 2 weeks? | SELECT_ONE | | I don't know | Yes |
| 134 | Was the fast or difficult breathing due to a problem in the chest or a blocked or runny nose? | SELECT_ONE | | Problem in chest only<br>Problem in nose only<br>Both in the chest and nose Other<br>I don't know | Yes |
| 135 | What else caused the fast or difficult breathing? | TEXT | | | Yes |
| 136 | How many days ago did the Diarrhea start? | TEXT | Please record the exact number of days, if same day then record 0. | Yes No | Yes |
| 137 | Did you seek advice or treatment outside the home for your child's Diarrhea? | | | | Yes |
| 138 | Where did you seek advice or treatment for your child's Diarrhea? | SELECT_MANY | Please select all that apply and probe the interviewee "Anywhere else?" | Goverment Hospital Post de santé<br>Centre de santé Hôpital de référence<br>Mobile/outreach clinic Village health worker<br>Private hospital/clinic<br>Private doctor | Yes |
| 139 | What is the name of the place where you sought advice or treatment? | TEXT | | | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | | | | Private pharmacy Mobile clinic (private) Religious healer Traditional healer Relative or friend Other | |
| 140 | What other place did you seek advice or treatment? | TEXT | Please record the exact number of days, if same day then record 0 | | Yes |
| 141 | How many days after the Diarrhea began did you first seek treatment? | NUMBER | | | Yes |
| 142 | For the following question, read the question to the caregiver and allow them to answer without reading the options out loud to them. Select all of the option(s) that best match their response and probe "Anything else?" | SELECT_ONE | | | Yes |
| 143 | What was given to treat the Diarrhea? | SELECT_MANY | | Nothing<br>ORS (Oral Rehydration Salts)<br>Zinc Tablets<br>Home-made fluid (ORT fluid) Pill or syrup<br>Injection<br>(IV) Intravenous Herbal Medicines I don't know Other | Yes |
| 144 | What else was given to treat the Diarrhea? | TEXT | | | Yes |
| 145 | How long after the Diarrhea started did your child first take the treatment? | NUMBER | | | Yes |
| 146 | Do you know how to prepare ORD (Oral Rehydration Salts)? | SELECT_ONE | Please record the exact number of days, if same day then record 0 | Yes<br>No | Yes |
| 147 | Did you seek advice or treatment for your child's cough and fast/difficult breathing from any source? | SELECT_ONE | | Yes<br>No | Yes |
| 148 | How many days after the cough and fast/difficult breathing began did you first seek treatment for your child? | NUMBER | | | Yes |
| 149 | Where did you seek advice or treatment for your child's cough and fast/difficulty breathing? | SELECT_MANY | Please select all that apply and probe the interviewee "Anywhere else?" | Government Hospital PHCC PHCU Mobile/outreach clinic Village health worker Private hospital/clinic Private doctor Private pharmacy Mobile clinic (private Religious | |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | | | | healer Traditional healer Relative or friend Other | |
| 150 | What is the name of the place where you sought advice or treatment? | TEXT | | Yes No | Yes |
| 151 | What other place did you seek advice or treatment? | TEXT | | | Yes |
| 152 | Was your child given any medicine to treat the cough and fast/difficulty breathing illness? | SELECT_ONE | Please select all that apply and probe the interviewee "Any other medicine?" | | Yes |
| 153 | Which medicines were given to your child? | SELECT_MANY | | Amoxicillin Erythromycin Azithromycin Anti-malarials Paracetamol Panadol Acetaminophen Aspirin Ibuprofen Other Don't know | Yes |
| 154 | What other medicines were given to your child? | TEXT | | | Yes |
| 155 | Where did you get the Amoxicillin? | SELECT_ONE | | Govt. Hospital PHCC PHCU Mobile/outreach clinic Village health worker Private hospital/clinic Private doctor Private pharmacy Mobile clinic (private) Religious healer Traditional healer Relative or friend Other | Yes |
| 156 | Where else did you get the Amoxicillin? | TEXT | Please record the exact number of days, if same day then record 0 | | Yes |
| 157 | What is the name of the facility from which you got the Amoxicillin? | TEXT | | | Yes |
| 158 | How long after the cough and fast/difficult breathing and problem on the chest started did your child first take the Amoxicillin? | NUMBER | | | Yes |
| 159 | For how many days did your child take the Amoxicillin? | NUMBER | Please record the exact number of | Yes, I experienced | Yes |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| 160 | Have you experienced any barriers or challenges when you took or wanted to take your child to the health facility? | SELECT_ONE | days, if same day then record 0 | barriers or challenges<br>No, I did not experience barriers or challenges | Yes |
| 161 | For the following question, read the question to the caregiver and allow them to answer without reading the options out loud to them. Select all of the option(s) that best match their response | SELECT_ONE | Do not read the options out loud, select all that are mentioned. If no barrier are mentioned please select no barrier/challenge | Continue<br>Not knowing where to go Not knowing when to go Getting permission to go Long distance to health facility Time it takes to travel Fees for treatment Inconvenient hours of Operation of health facility Not wanting to go alone Male health worker Health staff absent Too busy / no time Attitude / harsh health workers No medicine Long waiting time Other | Yes, I experienced barriers o |
| 162 | What barriers or challenges did you experience when you took or wanted to take your child to the health facility? | SELECT_MANY | | | Yes, I experienced barriers o |
| 163 | | TEXT | | | Other |
| 164 | | SELECT_ONE | If the caregiver provides more than one response, please ask her to tell you which one was the MAIN barrier/challenge | Not knowing where to go Not knowing when to go Getting permission to go Long distance to health facility Time it takes to travel Fees for treatment Inconvenient hours of Operation of health facility Not wanting to go alone Male health worker Health staff absent Too busy / no time | Yes, I experienced barriers o |

| # | Question | Question Type | Hint (Text and/or image) | Response Options | Conditional Logic Applied |
|---|---|---|---|---|---|
| | | | | Attitude / harsh health workers No medicine Long waiting time Other | |
| 165 | Thank you for taking the time to complete this survey. | SELECT_ONE | | Continue | Yes the interviewee consented |
| 166 | Thank you for completing all of the interviews in this area! | SELECT_ONE | | Continue | |