

**WOMEN'S NUTRITIONAL AND HYGIENIC KNOWLEDGE
IN MADAGASCAR: A QUALITATIVE HEALTH NEEDS
ASSESSMENT OF THE ANOSY REGION**

by

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ABSTRACT

Poor nutritional and hygienic practises continue to fuel high morbidity and mortality rates related to malnutrition in Madagascar. This study investigates women's nutritional and hygienic knowledge in order to characterize health needs in the Anosy region of Madagascar. Here, women govern nutritional and hygienic practises, including meal preparation and child care, and thus are in a position to provide invaluable input in qualifying local needs. Eight focus groups of 13-60 women each were conducted in the seven most impoverished communes of the Anosy, and a qualitative analysis was done. Participants were recruited with the aid of a local NGO, Azafady. An important finding of the study was that women demonstrated a basic understanding of nutrition and hygiene and outlined the need to reduce nutritional and hygienic practise barriers. These findings should be used to prioritize projects and research seeking to improve nutrition and hygiene in the Anosy region.

Keywords: Needs Assessment; Malnutrition; Hygiene; Women; Madagascar; Anosy Region

Subject Terms: Health Needs Assessment - Africa, sub-Saharan; Women's Nutritional Knowledge – Africa, sub-Saharan; Women's Hygienic Knowledge – Africa, sub-Saharan; Qualitative Evaluation

DEDICATION

This paper is dedicated to my family, who have been nothing but supportive in my educational endeavours. To my mom and dad, Kathy and Dan, who instilled a sense of responsibility for the world and raised me in a humble farm environment that emphasized the value of family and health. To my older sister, Jesse, who has always reminded me of the importance of the Arts and keeps me connected to the dance world. And of course, to my twin sister, Rosie, who is my musical motivator and inspiration, and my other half. Without her, I certainly would not be who I am today and who I will be tomorrow.

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GLOSSARY

AIDS	Acquired Immune Deficiency Syndrome
CSB	Basic Health Site (Centre de Santé de Base)
HIV	Human Immunodeficiency Virus
MAEP	Ministry of Agriculture, Farming, and Fishing (Ministère de l'Argiculture, de l'Élevage, et de la Pêche)
MAP	Madagascar Action Plan
MDGs	Millennium Development Goals
NGO	Non-Governmental Organization
ONN	National Nutritional Office (Office National de Nutrition)
PNNC	National Programme on Community Nutrition (Programme National de Nutrition Communautaire)
PSI	Population Services International
SEECALINE	Education and Monitoring on Food and Nutrition Materials in Schools and Communities (Surveillance et Éducation des Écoles et des Communautés en Matière d'alimentation et de Nutrition Élargie.
WHO	World Health Organization
UNICEF	United Nations Children's Fund

INTRODUCTION

In many low-income countries, women's nutritional and hygienic knowledge is inextricably linked to rates of malnutrition and a community's health needs. In such regions, women are often designated as the sole leaders of nutritional and hygienic activities (Jejeebhoy, 2005). Such is the case in the Anosy region of Madagascar. Women of the Anosy determine what kinds of meals are eaten, how meals are prepared, and if drinking water is clean, as well as, supervise child health and development (Azafady, 2007). As such, these women are the community members with the most experience to discuss malnutrition and health related needs, and their input during a qualitative health needs assessment is integral to gaining a realistic perspective of the local challenges relating to malnutrition (Azafady, 2007).

Malnutrition is a medical condition that is a dangerous and unjust condition of poverty resulting from extensive diarrhoea and inadequate protein, energy, and micronutrient intake (WHO, 2009A). While malnutrition is due to insufficient food quality and quantity, it has many indirect contributing factors. One such factor is hygiene. As hygiene can encompass a broad range of activities, in this study, it is discussed with specific reference to activities or behaviours, such as handwashing, water boiling, and waste disposal that can influence malnutrition by triggering or exacerbating diarrhoea. In short, as these specific hygienic

practises are intimately linked to malnutrition, they are discussed under the umbrella of malnutrition throughout this paper.

Dr. Paul Farmer once wrote, “...those who are sick and poor bear the brunt of human rights violations” (Farmer, 2004 pg.19). The connection between poverty and basic human rights violations is gaining momentum, particularly with regard to the right to clean water and food, which is fundamental to combating malnutrition. As such, nutrition and hygiene play integral roles in governing the survival (Thomas, Strauss & Henriques, 1990) and normal cognitive development (WHO, 1995) of children under-five years of age. Better nutrition and hygiene can result in reduced rates of malnutrition. By reducing malnutrition, fewer concomitant diseases occur, and thus, healthier and stronger children and communities develop and a stronger capacity to exit the cycle of poverty can be sewn (WHO, 2009B).

Malnutrition continues to persist as a fierce villain in the majority of sub-Saharan Africa communities. UNICEF (2007A) reported that in sub-Saharan Africa, 14 percent of infants have a low birth weight and 28 percent of under five year olds are moderately or severely underweight. As well, the WHO (2002) reported that 74 percent of sub-Saharan Africa populations have dangerously limited access to hygienic resources. With the establishment of the Millennium Development Goals (MDGs), the public health community has become aware of the urgency of addressing needs associated with poverty, poor nutrition, and poor hygiene in African countries. Madagascar is one such country,

experiencing unacceptable rates of malnutrition (World Bank, 2009; UNICEF, 2007B).

This study qualitatively investigated the nutritional and hygienic knowledge of women in the Anosy region in order to highlight the local health needs connected to malnutrition, so that ultimately, locally appropriate routes to reduce malnutrition could be identified. The findings suggest that women understand the interplay between poor nutritional and hygienic practises and malnutrition, but are unable to improve these practises due to various barriers. Therefore, in order for local projects and organizations to reduce malnutrition in the Anosy, nutritional and hygienic barriers must first be reduced.

BACKGROUND

Health Needs Assessment

This health needs assessment encompasses a qualitative protocol that utilizes women's nutritional and hygienic knowledge and health care system observations to identify local needs in relation to malnutrition. Needs are categorized as stated and identified, as a means to distinguish when a need was directly identified by participants (stated) or if a need was inferred from information collected in the study (identified). A health needs assessment is an effective means to acquire the information required to understand how to improve a community's health (Dixon & Harrison, 1997). Ultimately, a needs assessment seeks to improve health by identifying inefficient, ineffective, and inappropriate aspects of health care, and prioritizing resource allocation for cost effectiveness (Stevens & Gillam, 1998; Cavanagh & Chadwick, 2005). This study focuses on women's knowledge and observations as a means to pinpoint local health needs in relation to malnutrition.

Women of the Anosy Region

In the Anosy region, women are the most dominant figures involved in activities relating to hygiene and nutrition. Ultimately, women prepare meals, boil water, and monitor child health. The Anosy women are, in a sense, the local gatekeepers to the reduction of malnutrition, as by sharing their experiences,

knowledge, and observations, they are well positioned to identify local barriers to good health. Input from the Anosy women provides projects and research the opportunity to engage with the abundance of local knowledge that reflects the lived experience of community members. By doing so, projects are equipped to uncover information that may accurately prioritize future projects, positively impact the target population, and lend themselves to Community-Based Participatory Action (Minkler, Blackwell, Thompson, Tamir, 2003).

The rural fokontanys in which the Anosy women live vary from about 50 to 200 kilometres from the nearest city, Fort Dauphin. Due to extremely shoddy road conditions, this drive takes two to thirteen hours, respectively. The majority of Anosy women spend a significant portion of their day working in fields, planting, caring for, and harvesting crops. Once the daily field work is complete, women usually return to their village to care for their children, prepare meals, and finish household chores. In the last 30 years, women's workload has increased to include such tasks as selling prepared foods, mats, and animals as a means to provide for their families before the harvest seasons has arrived (Jarosz, 1997). Where villages directly intersect with the few roads that scatter the Anosy region, women are often found selling food products, such as fish, cassava, and fruit at road-side stands.

Communities within the Anosy region are particularly hard-hit by poverty and malnutrition (Azafady, 2007). It is not uncommon for women and children to eat one meal a day, which is often comprised of foods with little nutritional value such as plain rice or cassava. As a result, diseases and complications that are

tied to malnutrition are evident. Many children suffer from kwashiorkor, perpetual diarrhoea, and other conditions that are exacerbated by their malnourished state (Azafady, 2007). Not only are women constantly faced with the challenges associated with ill children, but they also must deal with their own poor health. For example, breastfeeding women are often faced with depleted breast milk reserves because of their low nutritional status. Thus, this study shows that the Anosy women are heavily burdened by malnutrition.

Currently there are only 0.29 physicians and 0.32 nurses for every 1000 people in Madagascar (WHO, 2006). As well, user fees continue to have damaging effects, despite governmental attempts to subsidize impoverished populations via the implementation of a policy that recovers health care centre costs (Honda & Hanson, 2007). Further, Basic Health Centres (CSBs), are sparsely located throughout rural regions; for example, in over 65 percent of rural communities, the closest one is more than a 5 kilometre walk away (MAP, 2007). Of the 3000 CSBs in Madagascar, the vast majority are understaffed and poorly equipped. Recent efforts have renovated and stocked a small number of CSBs with essential medicines (WHO, 2008), though unfortunately, these changes have not trickled down to the Anosy region. Needless-to-say, when children fall ill, women face the daunting and often impossible task of accessing a health care provider. As indicated above, it is the women in the Anosy region that manage child health. Because of this, women are constantly battling with the low quantity of general medical resources, unaffordable user fees, and far distances to health services.

Not only do user fees make health care inaccessible, so do the unaffordable costs of western medicine. To avoid these barriers, Anosy women often rely on traditional forms for healing. Commonly women boil various leaves in order to create medicinal teas that are useful against a plethora of ailments. There are approximately 13,000 plant species, many of which are used for healing (Randrianarivelosia et al., 2003), and 5000 traditional healers (Rasoanaivo, 2003). Traditional healing has strong roots in Madagascar. Unfortunately, deforestation and the dominant presence of allopathic medicines has marginalized and devalued traditional healing, often making it difficult for women to opt for plant medicines. In recognizing this shift, in 2002, the WHO initiated a global strategy on traditional, complementary, and alternative medicine (Finks, 2002). Soon after, the Government of Madagascar committed to this strategy by creating a National Advisory Committee on Traditional Medicine and a national policy that focuses on increasing access to traditional medical care (Rasoanaivo, 2003). Further, the fifth commitment of the Madagascar Action Plan (MAP) emphasizes the importance of building synergies between traditional and allopathic medicine (MAP, 2007). Despite such efforts, in this study it was observed that women in the Anosy region have not benefited from the augmentation of traditional medicines, and thus, continue to struggle with the affordability and accessibility of medicines.

Malnutrition in Madagascar

Madagascar is a sub-Saharan African island nation located off the coast of Mozambique. Although well known for its beauty and biological diversity, Madagascar is one of the poorest countries in the world with a per capita income of 330 USD per year (World Bank, 2008). With such poverty, opportunities that encourage and support adequate nutritional and hygienic practices are scarce, and thus, malnutrition is all too evident. The World Bank (2009) reported that, in Madagascar, 35 percent of child deaths are related to malnutrition, and UNICEF (2007B) reported that 17 percent of infants and 42 percent of under five year olds suffer from being moderately to severely underweight and 13 percent of under five year olds suffer from wasting. As well, less than 14 percent of rural populations have access to clean drinking water, and often this number drops to 0 percent (World Bank, 2009).

Despite malnutrition persisting countrywide, initiatives to reduce it have been made. In 1996, the SEECALINE (Education and Monitoring on Food and Nutrition Materials in Schools and Communities) Project established partnerships between community steering boards and local NGOs in various communities in order to improve children's nutritional status by educating women, increasing access to vaccines, and providing supplements (Marek, Diallo, Ndiayes & Rakotosalma, 1999). As well, the government created a National Office of Nutrition (ONN) in 2005 to help combat malnutrition amongst impoverished populations (MAP, 2007). A recent responsibility of the ONN is to assume management of SEECALINE, so that it can expand the project to a national level

(World Bank, 2006). Inspired by SEECALINE's success, non-governmental organizations (NGOs) have begun to aid this expansion by implementing similarly modelled projects. For example, the NGO, Azafady, created Project Votsotse that utilizes existing resources of and builds on SEECALINE (Azafady, 2007).

Aside from the creation of the ONN, the Government of Madagascar has acknowledged the importance of nutrition and health via their commitment to the MDGs and the creation of the Madagascar Action Plan (MAP) in 2005. MAP consists of eight Malagasy commitments that complement the MDGs and are to be achieved by 2012. More specifically, Commitment 4, "Rural Development and a Green Revolution", aims to alleviate poverty and malnutrition by promoting sustainable agriculture and improving rural financing. As well, Commitment 5, "Health, Family Planning, and the Fight against HIV/AIDS", aims to eliminate malnutrition and infectious disease by scaling-up safe drinking water resources and improving food security, hygienic practises, and health care accessibility (MAP, 2007). In line with these recent commitments, many nutrition-related initiatives have been planned for country-wide implementation. For example, the ONN plans to provide food to malnourished children and to integrate nutrition programs and health promotion into school activities (MAP, 2007). Funds to support such projects are being procured. For example, the World Bank recently contributed US\$10 million toward the creation of community nutrition sites (World Bank, 2009). While the political commitment and funds to realize MAP's health goals are present, few projects have actually been initiated in the Anosy

(Azafady, 2007). As such, a logical next step is to conduct health needs assessments in rural populations, so that projects can target the specific health needs of a community, and thus, MAP's policies can be evaluated and related programs can be implemented.

The Anosy Region & Project Votsotse

The Anosy region covers 25, 731 km² hectares of the Toliara province and is home to approximately 544,000 people. The Anosy region is divided into communes, which are then divided into fokontanys. Communes are a distinct group of fokontanys, and fokontanys are the smallest collection of a politically organized people, which comprises a women's community and is equivalent to a village (Ralison & Goossens, 2006) (See Appendix A for a map of the Anosy region). In March 2007, the Ministry of Agriculture, Farming, and Fishing (MAEP) workshop determined that seven communes within the Anosy region are amongst the most vulnerable to malnutrition and food insecurity (Azafady, 2007).

In response to MAEP's findings, the NGO, Azafady, became involved with community-based projects in the Anosy region (Azafady, 2007). In 2008, Azafady launched Project Votsotse, which aims to alleviate malnutrition in the Anosy region. Project Votsotse focuses on scaling-up child-monitoring systems and educating women on hygienic practises, as well as, educating on cooking and farming techniques that retain maximal nutritional value (Azafady, 2007). This paper reflects a health needs assessment that collected qualitative baseline data for the longitudinal evaluation of Project Votsotse. This project generated

suggestions to improve Project Votsotse and informed funders and development organizations of appropriate next steps to address local needs.

METHODS

Study Setting

The study was conducted in the seven most vulnerable communes of the Anosy region (See Appendix A) and in the Azafady office in Fort Dauphin, from April to July 2008. Eight focus groups were held in one fokontany of each commune, with the exception Tanadava, where two fokontanys hosted two different focus groups. Specific Fokontanys were selected on the basis of not having a National Programme on Community Nutrition (PNNC) site and being accessible with an all wheel drive vehicle. The discussion sites were chosen by finding shaded and relatively comfortable looking sitting areas; sites varied from being underneath trees to inside local buildings. Equipment included a recording device, notepaper, pens, the informed consent forms, and the moderator's guide (See Appendix B).

Participants

Participants were recruited by the Azafady field agents living in each commune. Focus groups consisted of 13 to 60 women and an occasional male. Permission to conduct focus groups was obtained from the Chef de Fokontany of each discussion site. Eligibility criteria included being female, being of child bearing age, and living in a PNNC site-absent fokontany. Informed consent was obtained from participants and no individuals refused consent. The study

received ethics approval by Simon Fraser University in British Columbia, Canada and Azafady, Fort Dauphin, Madagascar.

Team Member Roles & Contributions

Evelyn Dell

Evelyn designed the protocol and moderator's guide, analyzed results, and presented findings, as well as organized logistics such as vehicle hire, food supply, translator hire, and project funding. In the field, she worked with field agents to determine and set-up the discussion location, aided with participant recruitment, and answered participants' questions regarding the project. During the discussion, she controlled the tape recorder, took behavioural and social notes, attempted to ensure all moderator questions were asked and answered, kept an appropriate pace, helped maintain an appropriate discussion environment, encouraged participation from all women present, and ensured some form of validity check occurred. As well, Evelyn translated French into English during the transcription of focus groups.

Hangy Mamanevivoo

Hangy was the focus group moderator and translator. She introduced the project during each discussion, read the informed consent form aloud, explained the ground rules, fielded questions as necessary, and posed all questions during the discussion in Malagasy. As well, she helped maintain a friendly, open, and encouraging environment for the participants, flushing out as much information

from as many participants as possible. As the translator, she converted Malagasy into French as needed during the focus group and transcription.

Azafady Field Agents

Eight field agents were hired by Azafady to help implement Project Votsotse in each of the seven communes. Agents served as local contact persons and helped with logistics such as determining discussion location, informing eligible women of the discussion location and time, ensuring enough participants showed-up, locating the closest fokontany without a PNNC, and obtaining consent from the Chef de Fokontany. Agents were present during focus groups to clarify questions via the local dialect when necessary.

Data Collection

A list of *A priori* codes (See Appendix C) was generated by Evelyn and Azafady based on previous experience and discussions with the Azafady agents. For example, *A priori* codes included: Staple foods (stapl), Drinking Water (drik.wtr), Access (access), and Affordability (affdbil).

Aside from health oriented needs questions, such as “According to you, what is malnutrition?” and “Do you think handwashing is important? Why?”, data collection also involved questions regarding local perceptions of Azafady and Project Votsotse, so that Azafady could improve their local rapport and maintain strong participation in future projects. However, as this topic does not relate to malnutrition, it is not part of this health needs assessment, and therefore, is not

discussed here. The informed consent form (See Appendix D) and moderator’s guide (See Appendix B) were prepared in English, translated into Malagasy, and back-translated into English, and a focus group protocol was prepared. Questions highlighted both stated needs and identified needs. These two types of needs were distinguished because the accuracy in which they reflect women’s lived experience vary. Stated needs relate to questions such as, “What do you think you *need* in order to improve your children’s and community’s nutrition/health?”, whereby participants self-indicated a need. These needs directly reflect issues that the Anosy women perceive to be important, and thus, directly reflect their lived experience. Identified needs relate to questions such as, “Do you think it is important to boil your water before drinking it? Why?”, whereby participants did not self-indicate a need - instead, the need was inferred from participant responses, and thus, potentially reflect less accurately women’s lived experience. All forms needed in the field were laminated. The following focus group schedule was implemented:

DATE (2008)	TIME	COMMUNE	FOKONTANY	AGENT
Tues, May 13	pm	Analapats	Analapats I	Joée
Wed, May 14	am	Ambatoabo	Betamimena	Henri
Tues, May 20	pm	Ifotaka	Beraketa	Christian
Mon, May 26	pm	Andranobory	Anagnorasa	Angeline
Tues, May 27	am	Tanandava1	Bebea	Benedicte
Tues, May 27	pm	Tanandava2	Manintsevo	Randianasolo
Thurs, June 12	am	Ankariera	Ranomainty	Bien
Fri, June 13	pm	Ebelo	Ankaramangotroka	Florentin

Due to problems with the recording device, we used various recording methods in the eight focus groups. A mini disc recorder and two 75 minute discs were used in Analapats, Ifotaka, Tanandava1, and Tanandava2. In Ambatoabo, only handwritten notes were used, while a Flip Video recorder was used in

Andranobory and Ebelo, and a tape recorder was used in Ankariera. A week before each field trip, a vehicle and driver were booked. The day before each field trip, the vehicle rental was confirmed and all recording devices, consent forms, moderator guide, protocol, pens, paper, and extra batteries were packed.

Once in each commune, Azafady agents were located and the project's purpose, protocol, and agent's role were reviewed. The designated Fokontany and the Chef de Fokontany were located. The discussion site was selected and all interested participants were invited to sit in a semi-circular fashion, around Hangy and Evelyn. The project was introduced and the moderator's guide was followed. Focus groups took 1-1.5 hours. The participants, Chef de Fokontanys, and agents were thanked, and the site was returned to its original state.

Data Analysis

Table 1 provides a demographic description of focus groups. The population of each of the seven communes varied from about 3,300 to 22,500 people, and the total population was 90,500. The number of fokontanys within each commune varied from five to 18, and totalled 86. There were 13-60 women present during each focus group, totalling 373 women participants.

After each field trip, focus groups transcripts were translated, transcribed, and back-translated at the Azafady office in Fort Dauphin. A qualitative analysis was done, whereby transcripts were reviewed for key coding themes. Coding was initiated using the 24 *A priori* codes. *A priori* codes were modified and emergent codes were created, in order to create a finalized code list (See

appendix E) that more accurately represents the lived experience. The finalized code list consists of 22 categories of codes, 17 of which were further divided into subcategories, yielding 89 usable codes. The finalized code list consists primarily of emergent codes, most of which were developed by further clarifying or specifying an *A priori* code. For example, the *A priori* code “quality of eating” became the emergent code “FoodQual” that is broken into various subcategories representing *A priori* codes such as “meat”, “staple foods”, and “meals”. Codes were used to identify key ideas and points from each transcript, as they related to themes identified in the qualitative analysis.

Table 1. Demographic description of focus groups

Seven communes	Commune population	# fokontany in commune	Fokontany of focus group	# Of participants
Analapats	20,982	9	Analapats I	30
Ambatoabo	9,185	8	Betamimena	50
Ifotaka	18,934	18	Beraketa	60
Andranobory	4,730	7	Anagnorasa	13
Tanadava1	22,493	23	Bebea	60
Tanadava2	“	“	Manintsevo	50
Ankariera	3,297	5	Ranomainty	60
Ebelo	10,924	16	Ankaramangotroka	50
TOTAL	90,545	86	8	373

Source: Azafady, 2007

*Note: Two focus groups were held in two different fokontanys of the Tanadava commune.

RESULTS

Women's Hygienic Knowledge

Women's hygienic knowledge was assessed with the Key Questions, *"Do you think it is important to boil your water before drinking it? Why?"* and *"Do you think handwashing is important? Why?"* The codes DrinkWtr: good, micrb, DDsuprvsn, and DDtime were prevalent, showing that women recognize the importance of boiling water to make it safe for drinking, but are often unable to do so. Participants stated that they do not boil water because they do not have enough time to wait for the water to boil, or they are unable to supervise their children throughout an entire day, and thus cannot ensure that children drink the boiled water provided. The following quote illustrates this point:

"...It is good to boil water for the kids. The problem is that I boil the water in my house with the kids there and tell them not to drink the cold water and to drink the hot water, but then I have to leave to go and work out in the fields. Then there is no one there to supervise the children to make sure they drink the hot water." [No. 3, Ambatoabo]

The above Key Questions also yielded codes HandWsh: good, aftoil, b4eat, and DDtime. These indicate that participants understand the importance of handwashing, especially before eating and after defecating. However, handwashing is generally not feasible because travelling to water sources requires too much time and thus, there is not enough water available. In multiple discussions, women admit that they choose not to wash their hands because

they want to ensure there is enough water available for cooking and drinking.

One participant discusses her challenges:

“The main problem here is water...it is too far to go and get the water so we don't want to use up the water that we have to just wash our hands. It is our hygiene that is causing the health problems. When I go and work in the fields and I come back, I do not wash my hands and then I breastfeed my children whereby I am touching my breasts and the mouths of the children, and I think this is what can cause them to get sick...” [No. 1, Andranobory]

Overall, the female participants have a basic understanding of handwashing and water boiling, but are unable to do so due to barriers such as the distance to water sources and time required to boil water and supervise children. A summary of women's hygienic knowledge can be found in Table 2.

Table 2. Summary of women's hygienic and nutritional knowledge

	Water Boiling	Handwashing	Child Growth Supervision	Food Quality
Understand importance?	Yes	Yes	Yes	Yes
Put into practise?	No/Rarely	No/Rarely	No/Rarely	No/Rarely
Why/Why not?	A. Not enough time to wait for water to boil	A. Too much travel time to reach water source	A. Trained staff are too far away	A. Unsure of how to prepare 'right mix'
	B. Unable to supervise children throughout day to ensure boiled water is drank	B. Women want to ensure water available for cooking and drinking	B. Necessary equipment is not locally available	B. Do not have stable access to variety of foods

Note: The above information relates to women's identified needs.

Women's Nutritional Knowledge

The nutritional knowledge of women was assessed with the Introductory Question, *“What did you eat yesterday? If you have kids, what did they eat yesterday?”* The most frequently used codes were Carb: rice, mais, and cass, indicating that only staple foods such as rice, mais, and cassava are eaten the majority of the time. Protein sources such as meat and beans were not included as responses. Further, when times are difficult whether it be from drought or lack of funds, women implied they are lucky if they eat at all.

Nutritional knowledge was also qualified with the first three Linking Questions, *“According to you, what is good nutrition?”*, *“According to you, what is malnutrition?”*, and *“Do you feel that malnutrition is a problem here and why?”* The codes Carb: rice, mais, and cass arose frequently, indicating that participants understand the importance of rice, mais, and cassava to good nutrition and health. FoodQual: mixstap and mixmeat also arose, which shows that women understand the relevance of food quality and a ‘balanced diet’ to good nutrition. Women often implied that healthy eating involves the ‘right mix’ of foods and not just one staple food eaten alone. However, women are generally unsure of how to prepare this ‘right mix’ and often do not have access to a variety of foods. The frequency of the code FoodQual: desp suggests that despite cassava being an important food source, when eaten too often or alone, it leads to stomach pains. This code also indicates that it is common practise to eat a mixture of Tamarind seeds and ash in order to alleviate hunger pains, despite it resulting in diarrhoea. One participant demonstrates this point:

"We mix tamarind with ashes of wood when there is not enough food around. After that, my children have diarrhoea and so do I."
[Ebelo #11]

Lastly, the repetition of the code CropProb: drought implicates drought as a main agricultural barrier to good health.

Furthermore, nutritional knowledge was qualified with the Key Questions, "*What kind of meals and eating habits lead to being healthy/well?*" and "*Do you think it is important to supervise your children's weight and growth? Why?*" The codes Carb: rice, mais, and cass, as well as, FoodQual: mixstap, mixmeat, and desp were frequently used. These signify that rice, mais, and cassava are important local staple foods and that women understand the importance of food quality to good health, respectively. The repetition of these codes after various questions reiterates their relevance to identified needs. The appearance of the codes WhtGth: good, compslf, DDtime, and DDscale demonstrate that participants understand the importance of weighing and measuring their children in order to monitor health. However, women are often unable to do so because the trained staff, measuring equipment, and recording charts are too far away, or the equipment is simply not available.

Overall, women understand the importance of mixing various types of food, but are unsure of what should comprise this mixture and how to prepare it. Most meals consist of staple foods in the absence of a consistent protein source. Concerns of drought were expressed, alongside hunger desperation that leads to eating inappropriate food sources, such as mixing tamarind and ash, and consequently results negative health effects. Lastly, women understand the

importance of monitoring their children's health, but are often unable to do so due to the distance required to reach the necessary resources, or the lack of resources available. A summary of women's nutritional knowledge can be found in Table 2.

Women's Observations in the Context of Health Concerns

Women's observations relating to health were explored to help identify local needs. Observations were qualified with the Introductory Question, "*What are some of the major health concerns (needs) that you have?*" The codes HealthProb: malnut, diarr, and ID often appeared, indicating that the dominant malnutrition-related health concerns are diarrhoea and infectious diseases. The main infectious diseases identified were bilharzia, tuberculosis, mumps, typhoid, tetanus, and worms. The code HealthProb: cass was also common, as women observed the occurrence of stomach aches after eating cassava. One woman demonstrates this issue:

"When my children eat cassava, they get sick and develop diarrhoea." [No.8, Ifotaka]

Lastly, the code AccBarr: husbd occasionally surfaced, signifying that women observed a connection between gender and access to money and health care.

Furthermore, women's health related observations were depicted with the Key Question, "*What do you think you need in order to improve your children's and community's nutrition/health?*" and the Ending Question, "*If you could improve the health of people in your community right now, what is the first thing*

you would do (what would you need) and why?" The codes Need: food and basic were emphasized, indicating the need for food and basic household necessities such as pots, pans, utensils, and clothing. As well, the code Need: merch highlights women's abundance of entrepreneurial ideas to generate a steady income. The following quote illustrates this point:

"...I want to do some type of work like making muffins and selling coffee, but I do not have any money to start this up. If I had 1000 Ariary then I would buy coffee and start this up..." [No. 5, Ankariera]

In summary, women acknowledged pressing malnutrition-related health concerns to be diarrhoea, various infectious diseases, and the side effects experienced from eating too much cassava. Women observed that gender influences health in the Anosy region. Also, women expressed the need for more food, basic necessities, such as pots and pans, and a means to initiate activities to generate a steady income. Table 3 summarizes local health needs identified using women's knowledge and observations.

Table 3. Summary of health needs identified by women's observations

Need	Description/Explanation
Reduce prominent illnesses relating to malnutrition	This includes diarrhoea (*), infectious diseases (bilharzia, mumps, typhoid, tuberculosis, tetanus, and worms) (*), and side effects related to eating cassava (*, ☐)
Reduce/prevent the impacts of drought	Drought is a major source of crop destruction, which fuels food insecurity (☐)
Increase access to food, basic necessities, and a steady income	Major items discussed include meat, pots, pans, clothes, utensils, and a means to initiate entrepreneurial activities (*)

Note: * denotes a topic relating to stated needs
 ☐ denotes a topic relating to identified needs

DISCUSSION

This study reports on malnutrition related health needs of women and their communities in the Anosy region of Madagascar. As the Anosy region is extremely poor and continues to experience high rates of malnutrition (Azafady, 2007), this study is of value to Azafady and other organizations seeking to alleviate poverty and its effects. In the following discussion, needs are qualified within two categories.

Identified Needs: Women's Nutritional & Hygienic Knowledge

The first category relates to needs identified while qualifying women's nutritional and hygienic knowledge. Women recognize the importance of food preparation, but are unsure of how to do so to maximize nutritional uptake. As well, they understand the basics of good nutrition and hygiene, but are rarely able to implement their associated behaviours, such as handwashing, water boiling, and child health monitoring, due to various barriers. This suggests that educating on healthy food preparation is more useful than educating on handwashing, water boiling, and child monitoring, and that there is a need to reduce food insecurity and barriers, such as distances to water sources and child monitoring equipment. Projects that reduce such barriers have had visible success in other regions of Madagascar. For example, a project by the NGO,

BushProof, improved access to water in 12 rural villages by constructing 150 low-cost, locally manufactured and maintained wells (World Bank, 2009). Initiatives to reduce water boiling needs via purification tablets/droplets do not appear to be present in rural Anosy, despite their popularity and availability in urban areas. However, initiatives have commenced in other regions. For example, in January 2009, an organization called Population Services International (PSI) initiated an integrated approach to improving the health of children under-five, which includes the distribution of water purification droplets in isolated rural areas. As the project is in its infancy, outcomes are currently unknown (Clinton Global Initiatives, 2009). However, if outcomes prove successful, this project may be used to model similar programs in the Anosy region to improve access to clean drinking water. Solutions to increase daytime child supervision and the amount of time women spend working in fields do not appear well studied, which is likely because they do not have strong practical implications. This suggests that educating children on hygiene might be useful in encouraging the drinking of boiled water when unsupervised. As well, the reduction of barriers associated with child health monitoring, such as increased trained staff, scales, and growth and weight charts should be observed over the course of Project Votsotse, as this is one of the Project's objectives (Azafady, 2007).

Aside from handwashing, water boiling, and child monitoring barriers, women alluded to the rarity of meat and beans in their diets, despite the women wanting to mix them with staple foods. The lack of protein sources is not surprising as the price of an animal or beans are expensive compared with staple

foods. As there are few other protein sources in this region (Azafady, 2007), dietary insufficiencies are to be expected. This suggests there is a need to secure food sources, particularly sources of protein. As well, women demonstrated their desperation for food by admitting to intentionally eating stomach ache and diarrhoea inducing foods in order to alleviate hunger pains. Women also acknowledged their struggles with drought and agriculture. This again suggests there is a need to secure food sources, potentially by investigating methods to mitigate the occurrence or effects of drought. Such issues of food insecurity are well documented in the Anosy region, and addressing them is currently within the mandate of Project Votsotse (Azafady, 2007). These topics are not within the scope of this paper.

Stated Health Needs of the Anosy Women

The second category of needs relates to health needs directly identified by the Anosy women. Women identified major health concerns to be malnutrition, diarrhoea, and infectious diseases such as bilharzia, tuberculosis, mumps, typhoid, tetanus, and intestinal worms. As malnutrition and diarrhoea are a result of access barriers, they are addressed within the above section. The above infectious diseases are well documented in Madagascar (WHO, 2009C), and as their reduction falls under the goals of Project Votsotse and other projects in the area, they are not further discussed here.

Aside from identifying ailments relating to infectious disease, women identified the need to reduce the side effects of cassava. Cassava is a major

staple food in Madagascar, derived from a robust and drought resistant plant (El-Sharkawy, 2004) consisting of a starchy root and leaves that are a decent source of protein and vitamins (Bradbury & Holloway, 1988). Unfortunately, as a means to fend off insects, cassava plants contain a chemical that reacts to form cyanide when eaten. When consumed in abundance, the cassava cyanide results in a number of adverse effects in humans, including headaches, dizziness, vomiting, stomach pains, diarrhoea (Mlingi, Poulter, & Rosling, 1992), goitre and cretinism exacerbation, ataxic neuropathy (sensory loss), stunting of children, and Konzo (irreversible leg paralysis). Despite the creation of various methods to remove cyanide during meal preparation and genetically modifying cassava plants, there is currently no viable way to eliminate all adverse effects (Nhassico, Muquingue, Cliff, Cumbana, & Bradbury, 2008). This suggests that new means of reducing cassava toxicity are of extreme importance, especially amongst impoverished populations that often do not have the choice of other foods.

Furthermore, women alluded that a husband plays an important role in family health. This is not surprising, as male decision-making, social, and financial power has been linked to child and female health across the globe (Lillie-Blanton, Martinez, Taylor & Robinson, 1993). This suggests that understanding gender relations within the Anosy region may be essential to improving overall health.

Lastly, women reported the need for basic amenities such as food, pots, and clothing, and the desire to participate in income generating activities, which could afford them such items. Due to the high levels of poverty in Madagascar,

these needs are well recognized. The enhancement of female income is addressed in the fourth commitment of MAP, which aims to improve the current rural banking system by increasing the number of microcredit operations (MAP, 2007). However, these operations have yet to penetrate the rural fokontany of the Anosy region.

Limitations

First, this project does not attempt to meet the qualifications of a holistic needs assessment as described by Stevens & Gillam (1998), as it does not include thorough epidemiological and cost effective components. Secondly, it fails to address some important aspects of hygiene that may have shed light on other local needs. For example, the study does not investigate women's knowledge on the amount of time water should be boiled and how hands should be washed, which could provide valuable information for designing education programs. Also, it does not discuss waste disposal, and thus, it does not provide insight into local challenges associated with water borne illnesses and human waste. These limitations reflect the realities of research in a low-income setting, where research gold standards are not always feasible. Nonetheless, the results accurately reflect the lived experience of this representative group of Anosy women involved in discussions, and thus, are able to appropriately inform local organizations.

Thirdly, the study was unable to take into account the experiences and opinions of eligible women who did not attend the focus group and community

members that did not meet participation eligibility requirements. This includes men, children, and elderly women. This limitation makes the findings less generalizable than is ideal. However, the emphasis on women as participants over other community members is thoroughly outlined in the background section.

Excluding willing and enthusiastic participants is culturally inappropriate in the Anosy region. Therefore, participant recruitment was more successful than expected, and there was an abundance of women at each focus group. As such, almost all discussions consisted of over 30 women and some involved approximately 60. However, despite such large discussion numbers, an agreeable, open, and friendly atmosphere was maintained, and in general, there were five to eight main active participants.

A fifth limitation that arose relates to the involvement of men in the focus groups. Despite adamantly attempting to exclude men, it proved impossible for two reasons. First, the majority of Azafady agents are male, and their presence was required to translate necessary words into the local dialect and to provide an introduction. Secondly, the Chef de Fokontany is always male and often requested to be present, and to deny this request would have been insulting. However, the presence of these males did not appear to discourage or sway female participation, as indicated by the Malagasy Azafady agents.

A sixth limitation relates to the nature of recording devices, which inevitably resulted in the loss of bits of conversation because participants were sitting too far away, or there was too much overshadowing background noise. By holding the recording device out to the primary speaker, this effect was

minimized. As well, logistical issues led to the usage of three different recording devices over the course of the eight discussions. This likely resulted in a small variation of accuracy and detail between transcriptions. For example, for some focus groups a FlipVideo recorder was used, which in general, recorded sound more clearly than the tape recorder and mini disc recorder. There is a small chance this limitation makes the results less generalizable, but this possibility is unlikely as all recordings were of similar quality.

As well, during the discussions, participants were assigned numbers and when possible, distinguishing visual and vocal features were noted. This was helpful in placing voices with participants during the translations and transcriptions of focus groups that were not recorded with the FlipVideo. Despite doing so, it is probable that numbers assigned to participants were occasionally mixed up due to both random error and the ineffective selection of a distinguishing feature. Thus, some numbers may not represent the original participant.

The last major limitation of this project relates to language. As focus groups were translated from Malagache to French to English, it is likely that the richness of some information was lost. As well, inherent biases of both Evelyn and Hangy are likely present in the results and analysis. Such biases and translation inaccuracies were reduced by the back-translation of all data, as well as, by the validity cheques that were done throughout each focus group. Cultural differences and language barriers between Evelyn and Hangy resulted in questions occasionally being missed from the moderator's guide. To minimize

such errors, the moderator's guide was followed closely by both Evelyn and Hangy and constant communication between the two occurred.

RECOMMENDATIONS AND CONCLUSIONS

Azafady & Enforcing MAP

As this project demonstrates that women have a sound understanding of handwashing, water boiling, and child weighing, Azafady's Project Votsotse need not focus on these ideas within their educational activities for women. Instead, female education should focus on meal preparation and farming techniques that maximize nutritional gain, while reiterating the importance of hygiene and child supervision. However, educating children on nutrition and hygiene could prove useful in encouraging appropriate behaviours while children are unsupervised. Education should focus on the value of handwashing and clean drinking water.

Though this project identified needs beyond the scope of Project Votsotse, Azafady should hold responsibility in addressing them via other facets. By using this report, Azafady is equipped to partner with specialized organizations and inform them of the local health care barriers experienced by women in the Anosy region. For example, partnering with organizations such as BushProof and PSI could result in construction of wells and water purification projects to reduce clean water barriers. As Azafady has been working in the Anosy region for over ten years, they are well situated to determine potential contacts to begin addressing such health care barriers.

Furthermore, the Government of Madagascar should be held accountable to the commitments of MAP. By strengthening inter-organizational dialogue and

increasing stakeholder coordination, a collective voice can be formed. In creating a collective voice, it will become more feasible to address broader systemic health care barriers that extend beyond malnutrition in the Anosy region, such as waning traditional medicines, unaffordable and inaccessible allopathic medicines, and the need for rural microcredit systems, as well as, the reduction of health care worker shortages, user fees, and poorly equipped CSBs.

Future Research

Three major areas for future research have surfaced during this project. First, women of the Anosy region alluded to the idea that men play an essential role in their family's health. Thus, better understanding gender roles and their connection to the health of the Anosy people would be useful in designing health care projects in the region. Secondly, investigating the experiences of men would likely prove useful in shedding a more holistic light on the lived experience of people in the Anosy. Thirdly, though adverse health effects related to eating cassava have been relatively well studied, there is currently no effective, technologically appropriate, field-tested method for reducing cassava toxicity (Nhassico, Muquingue, Cliff, Cumbana, & Bradbury, 2008). Thus, there is a need for research to determine how to implement such a strategy to reduce the negative outcomes of regularly eating this critical staple food.

Overall, this study informs Azafady and other organizations of the health needs of the Anosy people and provides baseline qualitative data to evaluate Project Votsotse. The remaining phases of the longitudinal evaluation will be

crucial in determining the efficacy of Project Votsotse to reduce malnutrition.

Furthermore, the final evaluation phase will be well positioned to determine the impact of the Madagascar Action Plan in the Anosy region.

Appendix B: Focus Group Moderator Guide

Introductions

- Welcome participants to the group, encourage them to sit down, make themselves comfortable
- Introduce Hangy and Evelyn
- Explain the purpose of the focus group
- Answer any questions participants have
- Tell participants that the focus group will take between one and two hours
- Handout consent forms and read it out loud. Emphasize the voluntary nature of the focus group and that information discussed during the focus group will be private and that confidentiality will be maintained. Ensure that participants know their names will not be used.
- Outline what will happen during the focus group (“The moderator will ask questions and open discussion after each question”). Explain ground rules (All opinions are welcome, we are not seeking consensus, we are trying to stick to relevant topics, please don’t interrupt – let everyone share their opinions).
- Ask if there are/address any questions as necessary

BEGIN TAPE RECORDING

Opening Questions/Ice-breaking

- 1* *Go around the group and ask everyone to say their name, how many kids they have, where they are from (this may or may not work – gauge the situation)*

Introductory Questions

- 1* *What do you eat yesterday? If you have kids, what did they eat yesterday?*
- 2* *What are some major health concerns (needs) that you have?*
 - prompt for food related concerns [starvation, kwashiorkor, diarrhoea, lowered immune system – therefore increased susceptibility to other diseases (ie malaria, water borne illnesses)]

Linking Questions

- 1* *According to you, what is good nutrition?*
- 2* *According to you, what is malnutrition?*
- 3* *Do you feel that malnutrition is a problem here and why?*
 - prompt for drought, deforestation, affordability of foods and supplies, access to food and supplies
- 4* *How do you feel about ONG Azafady and their upcoming nutrition program (Project Votsotse)?*
 - prompt for usefulness, practicality, invasiveness, cultural concerns, Money and try to draw out how they truly perceive Azafady

5*How do other people (men, elders – anyone not represented in focus group) feel about Project Votsotse? (from conversations you have heard or had).

Key Questions

1*What kind of meals and eating habits lead to being healthy/well?

-can prompt for vegetables, meats, clean water

2*What do you think you need in order to improve your children's and community's nutrition/health?

-can prompt for clean water, farming equipment/techniques, specific foods

3*Do you think it is important to boil your water before drinking it? Why?

-can prompt for length of time (duration) they think is sufficient

4*Do you think handwashing is important? Why?

-prompt for usage of soap

5*Do you think it is important to supervise your children's weight and growth? Why or why not?

6*Do you think Project Votsotse will be able to improve the health of your community? Why or why not?

7*Do others in the community think it will be able to improve the health of your community? Why or why not?

Ending Questions

1*If you could (had the power, money etc) improve the health of people in your community right now, what is the first thing you would do (what would you need) and why?

-prompt for nutrition-related ideas

Validity Check/Summary Questions

*This is a summary of the focus group, highlighting the main points by quickly going over the questions we answered, briefly summarizing the main points

-ask participants whether they can confirm that these points are correct, whether there are additional comments

In brief:

-what good nutrition is, what malnutrition is & whether or not it is a concern,

-how you & the community perceive Azafady

-what makes a healthy meal

-what you think you need to improve health of the community

-water boiling, handwashing, child health monitoring

-your thoughts on how useful Project Votsotse will be

-what you would do to improve (what are the needs) the community's health

→add in anything else that stands out in your mind that we talked about

Conclusions/Closing Statements

- *Reiterate that the information collected was useful and will be used to evaluate Azafady's Program, and aims to help improve the health of the community
- * Thank participants for their time and for their contribution to our learning

Appendix C: *A Priori* Code List

*Denotes *A priori* codes that are NOT represented in the finalized code list. All other codes are represented, either directly or indirectly, by the emergent codes created.

Section A: Local Perceptions of Azafady and Project Votsotse:

1. *Resentment (**restmt**)
2. *Relief (**relf**)
3. *Indifference (**indiff**)
4. *Invasiveness (**invsv**)
5. Usefulness (**usflnss**)
6. *Cultural sensitivity (**cult.senst**)
7. Outcomes (**outcms**)
8. Previous experiences (**prevs.exp**)

Section B: Nutritional and Hygienic Knowledge and Needs

9. Meals (**meals**)
10. Quality of eating (**qual.eat**)
11. Quantity (**quant**)
12. Vegetables (**veges**)
13. Meat (**meat**)
14. Staple foods (**stapl**)
15. Drinking Water (**drik.wtr**)
16. Availability (**avail**)
17. Access (**access**)
18. Affordability (**affdbil**)
19. Time (**time**)
20. Children (**chldrn**)
21. Male influences (**male.infl**)
22. *Elder influences (**eld.infl**)
23. Tradition (**tradtn**)
24. Weather (**weathr**)
25. Crops (**crops**)
26. Sustainability (**sustabil**)
27. *Deities (**deit.**)
28. Transportation (**transprtn**)
29. Farming Equipment (**equip**)
30. Farming Supplies (**suppls**)
31. Diarrhoea (**diarrh**)
32. *Immune system (**imm.sys**)

Appendix D: Information and Consent From

Simon Fraser University & ONG Azafady INFORMATION & CONSENT FORM

What is the purpose of this focus group?

There are two reasons we are conducting this focus group. First, we aim to understand the current level of nutritional knowledge of the people in the Anosy region of Madagascar, and more specifically, people in your community. Azafady is starting a program to help combat malnutrition in your area, and we want to make sure that it helps your community become healthier and more informed about good nutrition and hygienic practices; throughout the duration of Azafady's project, we will continue having these types of focus groups to help measure such improvements. Thus, our ultimate goal is to help understand to what extent the nutrition program works for you and your community. Secondly, the focus group will serve to identify local perceptions of ONG Azafady, so that future projects can be better equipped to address the specific needs of local people and will involve an enhanced partnership with your community.

What do I have to do?

We will ask a series of questions and listen to participants' answers; the discussion will take approximately 1 to 2 hours. All opinions are welcomed, and we are not looking for everyone to come to a consensus – we just want to hear what you have to say – there are no right or wrong answers.

Why are you tape recording this? What will happen to the tape?

We are tape recording simply because it is difficult to record all of what is being said with the hand-written notes alone. Only the researchers present, Evelyn and Hangy, will listen to the tape, and it will be erased in approximately 9 weeks, once the project is completed.

Will anyone know what I said during the focus group?

Some parts of today's discussion will be transcribed from the tape, but names will be changed to hide your identity. While who said what specifically will remain anonymous, the main themes and ideas from today will be used in our final report. As well, by consenting to participate in the focus group, you confirm that any information you encounter will be kept confidential and not revealed to parties outside the focus group.

What risks am I taking and what do I get out of participating?

The risk of any type of physical harm or emotional harm is no different than that encountered in day to day life; thus, there are no associated risks. There is no compensation or payment for participating. What you do get is the opportunity to share your knowledge about nutrition and opinion about ONG Azafady.

What if I want to quit the discussion?

Your participation is completely voluntary. If you wish to end your participation, or leave the focus group, you may do so at any point in time. Let us emphasize that you can choose to NOT answer any question you wish. Though, we encourage you to share your opinions, as we are very interested in hearing what you have to say.

I have a question. How do I ask it?

You can ask questions at any point during the focus group process – now, during the discussion, or afterwards. Once the focus group is finished, you are welcome to contact Evelyn or Azafady if you have any questions. Below we have listed our contact information, and we will leave this information with you.

Evelyn: Email: emd4@sfu.ca
 Phone: +261 (0) 340 854 661

ONG Azafady: Email: gaby@azafady.org
 Mail: Gaby Smith, Project Development Coordinator, BP 318
 Fort Dauphin, Madagascar
 Phone: Orange +261 (0) 324 717 928
 Office Pac Telma + 261 (0) 209 290 268

**You do not need to sign this form. Your participation implies your consent.
Thank you for being part of this focus group!**

Appendix E: Finalized Code List

The following is a list of the finalized codes used to code the focus group transcriptions. The italicized font in brackets provides a brief explanation as to what each code represents; codes without any explanation in brackets are self-explanatory. Some of these codes will be further modified upon the completion of focus groups at various stages of the Project Votsotse evaluation.

Section A: Local Perceptions of Azafady and Project Votsotse

1. **2early2tell** (*Since it is just the beginning of Project Votsotse, it is too early to tell if progress is or will be happening*)
2. **CurrentContent** (*So far so good attitude / general acceptance / good things will come attitude / no real explanation given*)
3. **IncrsAwareness** (*Brings new & good ideas / helping educate villagers / promoting behaviour change*)
4. **Reassur** (*Reassurance of positive attitude toward Azafady*)
5. **ImprvHealth** (*Belief that will help improve the overall health of children and/or women and villagers*)
6. **Wait** (*Clear expression that people are getting tired of waiting for project to start & they want it to start soon*)
7. **Response** (*Explanation of why not all women are responding – either shyness or they simply agree w/ responses already given*)
8. **PrvsProj:** (*Previous projects or experience by other organizations or Azafady that contribute to the current perceptions of Azafady*)
positive (*Past development project left a favourable impression, so likely Azafady will also do good things*)
tentative (*Past development project have lead to disappointment, so are tentative to accept project*)

Section B: Nutritional and Hygienic Knowledge and Needs

1. **Carb:** (*Foods mainly comprised of carbohydrates – very starchy - & are mentioned alone OR the mix w/ something else is NOT implied. As well, these do not apply to discussion involving foods they feel they 'need', as this is coded elsewhere*)
mais
rice
cass (*Cassava as a good food source – * this code not used for discussion regarding the negative effects of cassava*)
sweetpot (*Sweet potato*)
squash
sorgum
2. **Fru/Veg:** (*Any type of food that falls under fruit and vegetable category*)

leaf (Leaves from some form of vegetable ie potato or cassava)
cacti (Cactus fruit)

3. Protein: bean (Any type of bean representing protein in the diet)

4. Water: boilwl (Discussion other than boiling or handwashing – water as food source from boiling plants-ie leaves- or rice)

5. HealthProb: (Specific health problems mentioned * issues relating to maternal health are coded under 'MatHealth'. The following symbols are used to clarify to whom the health problem is associated. women: Δ Children under 5: • newborn: ±)

ID (Any type of infectious or parasitic disease ie bilharzia, TB, cough, mumps, typhoid, tetanus, intestinal worms)

Malnut (Malnutrition indicated as a health problem/concern)

diarr (Diarrhoea given as a general problem)

cass (The upset stomach that arises after eating cassava)

stom (Upset stomach for reasons other than eating cassava)

vomit (Vomitin – source may or may not be listed)

head (Headache or fevers – source may or may not be suggested)

oral (Any tooth or oral related problem)

hgyne (Hygiene)

6. FoodPrep: (How certain foods are prepared *note this does not include preparation of plant medicines that are drunk as teas)

boil (Foods that are boiled)

mash (Foods prepared by being mashed)

grill (Foods prepared by being grilled)

7. AccBarr: (Barriers to access health care, food, resources – highlighted as a major area of concern)

distance (Cannot gain access because it too far away)

cost (Despite resource being available, cannot afford it)

resource (Resource is not readily / locally available)

husbd (Lack of husband=barrier: perceived importance of women to have male provider)

job (Lack of job opportunities)

8. FoodQual: (Codes pertaining to quality of foods eaten)

mixstap (Basic understanding of importance of food quality via general food or carb. variation—not just one staple alone)

mixmeat (Basic understanding of importance of food quality via carb & meat mixture)

likeable (Food choice for children based on idea that will be eaten because tastes good to them)

mixoil (Any discussion on the importance of oil in ones diet)

desp (*Desperation – eating foods that make them sick b/c that is all that's available – indicates hard times + poor quality food*)
dtknow (*Signifies someone admitting / stating that they do not know about this question and malnutrition*)
growth (*Touches on idea that need good quality foods to have good growth*)

9. Trtmnt (*This includes actual forms of treatment employed, it does not pertain to access and costs issues*)

plantmed (*Any type of plant component used to treat various ailments – representing traditional medicine*)

westmed (*Any type of typical western pharmaceutical used to treat various ailments – representing allopathic medicine*)

10. CropProb: (*Something that creates problems for crop growth and/or development*)

drought (*Lack of rain*)

insect (*Insect pest that feeds on plant*)

soil (*Soil is too saline or rocky for optimal/good crop production*)

11. Ask4help (*Women asks / implies for specific aid with a certain problem*)

peers (*Women asks for advice or item from other participants*)

vasa (*Women asks for advice or item from non-participants ie Evelyn*)

12. PeerSugg: (*Consult given by a participant*)

mathealth (*Suggestion that maternal health should be addressed to improve women and/or child health*)

doc (*Suggestion that women should see a health care provider*)

foodqual (*Suggestion that adjusting food types leads to improved health*)

watqual (*Suggestion that water quality is important – ie via treatment, boiling, ect*)

13. AgentSuggtn: (*Consult given by agent, Hangy, Agent of Chef*)

mathealth (*Suggestion that maternal health should be addressed to improve women and/or child health*)

foodqual (*Suggestion that adjusting food types will lead to improved health*)

doc (*Suggestion given that women should see a health care provider*)

14. Educatn: (*Situation that arises where education dominates the discussion*)

agent (*Similar to suggestion, expanded to become extended opportunity to educate participants*)

other (*Discussion where it is clear that outside education of some form has been previously provided*)

male (*Male –ie Chef or other male present- educates / shares opinion*)

- 15. DrinkWtr:** *(Discussion surrounding boiling drinking water)*
good *(A simple statement demonstrating that they know it is good, but without a reason why)*
saline *(Problems associated with having overly saline water source)*
micrb *(Discussion / implication that boiling water kills of microbes)*
trtmnt *(Discussion on importance of water treatment ie sur eau)*
sooth *(Suggestion that drinking boiled water has soothing health effects)*
boiltime *(Discussion on amount of time drinking water is boiled)*
***DD:** *(DD= Don't Do – reasons as to why women do not do certain activities – these codes overlap slightly with access barriers, but are coded here to be more specific)*
DDsuprvsn *(Too busy to supervise children to enforce the drinking of boiled water)*
DDtime *(Too busy to collect and boil water)*
DDLazy *(Too lazy to collect and boil water)*
DDnoreas *(No reason given as to why do not boil water)*
- 16. HandWsh:** *(Discussion surrounding handwashing)*
good *(A simple statement demonstrating that they know it is good, but without a reason why)*
b4eat *(Suggestion that it is good to do before eating)*
Aftoil *(Suggesting that it is good to do after using the toilet)*
Micrb *(Discussion on handwashing and reducing microbes)*
***DD:** *(Represents the same as listed above)*
DDsuprvsn *(Too busy to supervise children to enforce handwashing)*
DDtime *(Too busy in the day to spend time washing hands)*
DDnoreas *(No reason given as to why do not wash hands)*
DDhab *(Do not wash hands because are not used to doing it – it is habit for them to NOT do it)*
- 17. WhtGth:** *(Discussion surrounding children weight and growth supervision)*
good *(S simple statement demonstrating that they know it is good, but without a reason why)*
compslf *(Monitoring child is good - can follow their health via comparison to over time)*
compoth *(Monitoring child is good - can follow their health of your child via comparison to other children)*
***DD:** *(Represents the same as listed above)*
DDtime *(Too busy to monitor child health)*
DDnoreas *(No reason as to why do not monitor child health)*
DDscale *(Do not monitor child health - no access to trained staff or equipment)*
- 18. Need:** *(Things women need / want at this point – they are not necessarily asking for these, but saying that is what they need)*

food (Includes basic foods such as rice, beans, cassava, meat, fish that are for family & children – food to eat)
animal (This includes a zebu or goat – larger animal to render milk and meat)
basic (Basic necessities other than food items such as clothes, house, pots, and utensils)
med (Anything health related: seek medical care, buy medicines, nutritional aid, and information to improve health)
hygne (Products that relate to improving personal hygiene)
lux (Items that are luxury and not necessity ie jewellery, fancy home)
merch (Merchandise - includes food or other items that can be bought and resold to generate income)
equip (Various farm equipment, seeds, or plants)
eductn (Education related - school or learning how to read & write)

- 19. MatHealth:** (Maternal health issues not discussed in the form of a consult – ie major health concerns or food types eaten during pregnancy)
preg (Topics relating to health during pregnancy)
brstfed (Topics relating to breastfeeding)
- 20. SeekCare** (Discussion on seeking a health care provider: (+) know / want to seek care, (-) do not know / want to seek care)
- 21. MaleConsult** (Discussion on women consulting men in order to obtain money for family and individual needs)
- 22. FemaleEmp** (Display of female empowerment / realisation of equity with gender roles)

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