

**BARRIER ANALYSIS OF
EXCLUSIVE BREASTFEEDING
IN RUYIGI AND CANCUZO PROVINCES,
BURUNDI**

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Acronyms

AED	Academy for Educational Development
BA	Barrier Analysis
DBC	Designing for Behavior Change
DHS	Demographic and Health Surveys
EBF	Exclusive Breastfeeding
FANTA	Food and Nutrition Technical Assistance
FH	Food for the Hungry
FFP	Food for Peace
HBM	Health Belief Model
IBF	Immediate Breastfeeding
IFPRI	International Food Policy Research Institute
LDM	Local Determinants of Malnutrition
MDG	Millennium Development Goal
OR	Odds Ratio
PPP	Purchasing Power Parity
TPB	Theory of Planned Behavior
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WAZ	Weight for Age Z-score
WFP	World Food Programme
WHO	World Health Organization

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Abstract

While the wide-ranging benefits of exclusive breastfeeding have been affirmed by UNICEF, only 45 percent of Burundian children are exclusively breastfed. Exclusive breastfeeding for six months is a key measure to combat the alarmingly high rates of childhood malnutrition in Burundi and accelerate child survival.

Objective To understand the key determinants of exclusive breastfeeding practices among mothers of children 0-11 months in the Cancuzo and Ruyigi provinces of Burundi.

Methodology Barrier Analysis, a rapid-assessment tool developed by Food for the Hungry, was used to discover key behavioral determinants of exclusive breastfeeding. Our team interviewed 45 mothers of children 0-11 months who practiced exclusive breastfeeding, and 49 mothers of children 0-11 months who did not practice exclusive breastfeeding in 16 different *collines* in Cancuzo and Ruyigi provinces. The questionnaire employed 22 closed and open-ended questions which corresponded to eight determinants: perceived severity, perceived susceptibility, perceived action efficacy, perceived social acceptability, perceived self-efficacy, perceived divine will, perceived positive/negative attributes, and cues for action. To analyze the data, aspects of the Academy for Educational Development's Doer/Non-Doer Analysis and Designing for Behavior Change Framework were used.

Results Seven key determinants exhibited statistically significant ($p < .05$) findings: perceived action efficacy (OR=.05), perceived divine will (OR=.06), perceived social acceptability (OR=3.1), perceived self-efficacy (OR=7.98), perceived negative attributes (OR=.14), and cues for action (OR=6.3).

Conclusion The most significant barriers were that mothers do not believe EBF to be effective in preventing malnutrition (perceived action efficacy), mothers believe that God does not approve of EBF (perceived divine will), and mothers do not believe that their key social networks approve of EBF (perceived social acceptability). Recommended behavior change activities may include positive deviance studies, peer-based lactation counseling, mobilizing of spiritual leaders, sermon guidelines addressing EBF, radio broadcasts featuring mothers-in-law, husbands, cousins, and mothers who support EBF,

and training of key social networks to be community-level health promoters. Formative research methods such as Barrier Analysis should be used to understand local determinants of desired behaviors in order to effectively inform behavior change messages and activities.

I. Introduction

Problem Statement: Malnutrition in Burundi

Burundi is a nation still recovering from fifteen years of civil war, which when combined with extreme poverty, a fragile political rebuilding process, and recurrent climatic shocks, has led to a grave 81 percent of the population as food insecure (WFP 2010). Additionally, these factors have had a strongly negative impact on Burundi's overall development and health indicators. According to the United Nations Development Programme, 93.4 percent of Burundi's population lives on less than \$2 a day (UNDP 2009). The hardships of Burundi's current economy are also related to low public expenditures on healthcare, with only US \$4 in purchasing power parity (PPP) spent per capita per year on health-related public expenditures (UNDP 2009). A mere 43 years of age is the healthy life expectancy (UNDP 2009), while the under-5 mortality rate is a lamentable 180 out of 1,000—the fifteenth worst in the world (World Bank 2009).

Further, the World Food Programme reports that 46 percent of Burundi's population is chronically malnourished (WFP 2010). The average per capita agricultural production is only 1,400 kilocalories per day, in contrast to the recommended minimum requirement of 2,100. Even during harvest seasons, typical Burundian households must spend up to 60 percent of their income on food (WFP 2010). Burundi has a Global Hunger Index (GHI)¹ value of 38.3, making it among six countries with the highest GHI and in the category of “extremely alarming” (IFPRI 2009, p. 4). This chronic malnourishment and food insecurity have taken their toll, particularly on Burundi's children. According to UNICEF, 39 percent of children under five years of age suffer from moderate and severe underweight (UNICEF 2004), and 53 percent of children under five suffer from moderate to severe stunting (UNICEF 2004). The provinces targeted by project *Tubaramure* (Cankuzo, Ruyigi, Kirundo, Muyinga) report an even higher stunting rate, of as much as 58 percent for children under five (UNICEF 2007).

¹ The International Food Policy Research Institute's Global Hunger Index (GHI) captures three dimensions of hunger: insufficient food availability, shortfalls in children's nutritional status, and child mortality.

Importance of Focusing on Nutrition in Under Twos and Exclusive Breastfeeding

This research will give particular emphasis to an important strategy in child survival, nutrition among children under two years of age, and a key health behavior which is associated with it, exclusive breastfeeding. Extensive literature exists which supports the importance of both nutrition in children under two years of age and exclusive breastfeeding. Notably, an evaluation study performed by the Academy for Educational Development's Food and Nutrition Technical Assistance Project (FANTA), using national data sets from 59 countries, gives the major conclusion that "changes in young child mortality over the past several decades were significantly related to changes in general malnutrition (Pelletier 2002, p. 12)." This statistically-significant relationship between nutrition and child survival was confirmed even after controlling for the substantial declines in child mortality which were the result of other social, economic and health-related factors. AED's FANTA program also asserts that the policy shifts toward selective child survival interventions in the 1980s may have been responsible for saving many lives and "this impact could be improved by intensifying efforts to ensure access to child survival interventions among the more malnourished populations (Pelletier 2002, p. 15-16)."

Secondly, there is convincing evidence that the first two years in a child's life—in addition to the prenatal period—is a key window of opportunity for nutritional interventions. Research shows that "this period is not only the time of greatest vulnerability and risk of possibly irreversible long-term physical and mental damage, but is also the period of greatest benefits from nutrition interventions. Consequently, there is increasing interest in developing, implementing, and assessing nutritional interventions to address childhood under-nutrition based on a preventive approach (Ruel, 2008, p. 588)." The Academy for Educational Development (AED) further identifies the key aspects of care and feeding in the vulnerable period of 0-23 months of age as breastfeeding, complementary feeding, and other preventive and curative health-related practices like good hygiene, timely immunization, appropriate home health care, and care-seeking during illness (Loechl 2003).

For the purposes of this research, we will focus on an important preventative health behavior: exclusive breastfeeding (EBF), defined as giving an infant only breast

milk—no other foods or liquids—up to six months of age. The World Health Organization (WHO) Expert Consultation recommends exclusive breastfeeding for six months, with introduction of complementary foods and continued breastfeeding thereafter (WHO 2001). The research supporting this practice and its many benefits is strong. According to UNICEF, “If every baby were exclusively breastfed from birth for six months, an estimated 1.5 million lives would be saved each year. And not just saved, but enhanced, because breast milk is the perfect food for a baby’s first six months of life – no manufactured product can equal it” (UNICEF 1999, p. 1). Additionally, studies have shown that the introduction of any fluids other than breast milk in the first six months of life is associated with increased risk of morbidity and mortality (Lauer 2004, p. 9). In developing-country settings, the most important potential advantage of exclusive breastfeeding for six months—versus exclusive breastfeeding for a shorter period of time—relates to infectious disease morbidity and mortality, especially that due to gastrointestinal infection (WHO 2001).

Despite the vast amount of data supporting the many health benefits of exclusive breastfeeding, exclusive breastfeeding rates worldwide remain strikingly low—at about 25% in Africa, 45% in Asia, and 31% in Latin America and the Caribbean. This amounts to an average of only 39% of infants ≤ 6 months of age being exclusively breastfed in developing countries (Lauer 2004). In light of this, it is important to investigate the potential barriers to the adoption of exclusive breastfeeding practices, and understand why women often do not always practice exclusive breastfeeding even though they may be aware of its benefits.

Need for more effective behavior change messages and activities

While DHS studies and other population-based studies routinely provide information to program decision makers on *what* needs to change in terms of behavior change (e.g., increase EBF rates), information on *why* people are not changing is scarce. Because many of these barriers to adoption may be specific to local populations’ perspectives and circumstances, it is vital to not rely solely on published literature from other contexts or on program managers’ “guesses” from previous experiences. Instead, it

is essential to systematically search for evidence-based solutions to making behavior change happen.

Among the many childhood malnutrition interventions, there is indeed a need for more focus on effective messages and activities that result in rapid and lasting behavior change. According to Tom Davis, Director of Health Programs at Food for the Hungry, “We need to operate more as teachers and persuaders rather than doctors and logisticians”(Davis 2007). In considering situations of malnutrition and child survival, there is a tendency to think that provision of greater commodities (e.g, food rations) will solve the issue, when in fact focusing on nutrition-related behavior change interventions may be a much more effective means of addressing long-term child survival. According to Marcia Griffiths, “Providing food has been the conventional treatment for malnutrition. Countries spend millions of dollars on food aid, with little impact on nutrition or health. There is a place for food aid, particularly in emergencies. However, the accumulating body of evidence suggests that with the proper guidance, the majority of families can meet the nutritional needs of their young children with their own resources”(Griffiths 2001, p. 2). Davis further asserts that rather than merely providing commodities and rehabilitating malnourished children, it is important to focus primarily instead at the household level to help people to change key values, motivations, and beliefs that affect their adoption of key health behaviors (Davis 2007).

For example, in a 2002 study conducted by Food for the Hungry in Cochabamba, Bolivia, mothers believed that the common cold was more serious than malnutrition (Davis 2002). Understandably, if basic beliefs about the severity of a condition are incorrect, it is very difficult to bring about sustainable behavior change. Further, in order to develop more effective behavior change messages and activities, it is essential to understand the key determinants as to why the target populations adopt or do not adopt the desired health behaviors.

This discovery of key determinants needs to be based on solid formative research methods *before* determining an intervention. The importance of such research is illustrated in a 1984 study performed by Food for the Hungry (FH) in the Dominican Republic to try to understand why mothers were not purifying their water (Davis 2004). Before the research, staff felt that the mothers had not adequately been transmitted the

current health messages about purifying water, and that the mothers were simply too lazy to purify their drinking water. FH staff decided to investigate this issue through the use of an earlier version of the Barrier Analysis methodology. Barrier Analysis (BA) is a methodology for investigating key determinants of a targeted health behavior which will be described later in this paper. After conducting the BA study of mothers not purifying water, FH staff found interesting results. Among them, mothers who saw that their water was clear believed that the water was already clean, and thus saw no need for purification. Additionally, among the purification methods introduced to them, mothers found boiling water too expensive and were unsure about the safety and taste of using chlorine. This example shows the importance of understanding the local situation and the key determinants of why the target population adopts or does not adopt the desired behavior, in order to inform effective behavior change interventions.

As a case study of using Barrier Analysis, this paper will focus on investigating some of the key determinants of exclusive breastfeeding among mothers in Burundi, based on a formative research study of mothers of children between 0-11 months in Cancuzo and Ruyigi provinces in December 2009. In doing so, we will also introduce the Barrier Analysis methodology as a means of understanding certain key determinants of health behaviors. Finally, this paper will discuss recommendations for how the discovery of these identified key determinants of exclusive breastfeeding in Burundi may be used to develop important behavior change communication messages and activities.

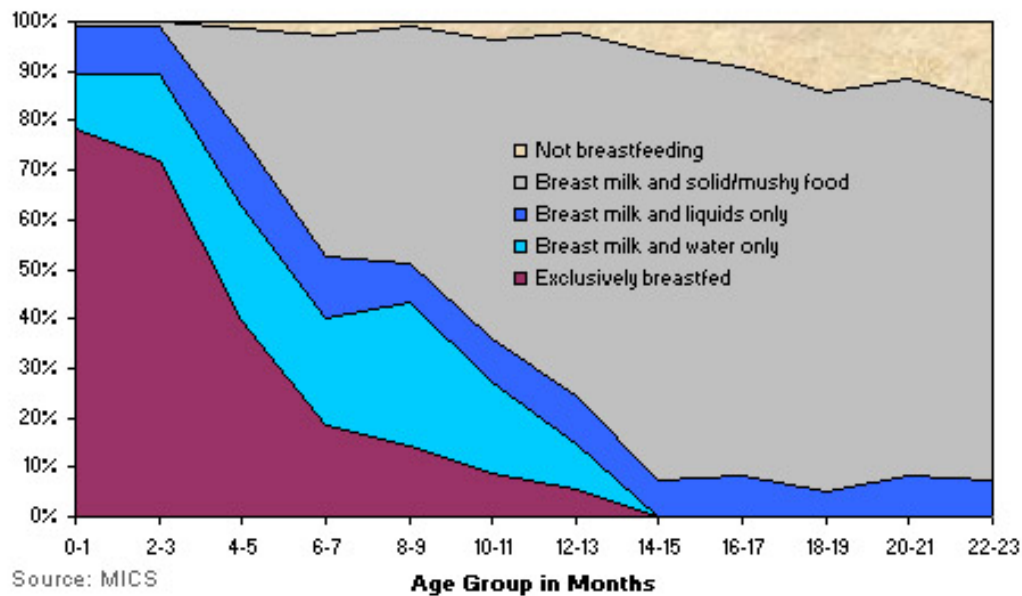
II. Background

Breastfeeding Practices in Burundi

In light of economic difficulties and food insecurity in Burundi, adequate breastfeeding practices are indeed a necessary measure to ensure the nutrition of Burundian infants. Unfortunately, while exclusive breastfeeding rates of Burundian children under four months of age is at approximately 74.3 percent (UNICEF 2000), this percentage greatly decreases between four and six months. According to UNICEF, only 45 percent of infants under six months of age are exclusively breastfed (UNICEF 2004).

The following graph shows the various breastfeeding practices by age in Burundi. It is notable that exclusive breastfeeding decreases significantly between four and six months (UNICEF 2000), a critical time period in ensuring infants' nutrition and health. The reasons for this dramatic decline in exclusive breastfeeding rates between the four and six months period merits further study in another body of research.

Figure 1: Breastfeeding Practices by Age, Burundi 2000



Determinants of exclusive breastfeeding in other international contexts

Researchers have attempted to understand determinants of exclusive breastfeeding in several other contexts, using varied research methods and with varied outcomes. This section will discuss some published studies of researchers who have explored determinants of exclusive breastfeeding in various international contexts. While there are some general themes which may emerge, it is important to note that the factors affecting exclusive breastfeeding rates vary greatly and may also operate differently in diverse contexts, and even during different periods of time. For example, the influence of a child's father may depend on the extent to which—in that society—a woman's male partner has control over her body. Interestingly, maternal education had formerly been associated with higher breastfeeding rates in industrialized countries and with lower rates

in developing countries, but more recently these trends have been changing with educated mothers in the industrialized contexts re-adopting breastfeeding (WHO 1998).

The vast majority of the literature investigating exclusive breastfeeding determinants appears to indicate certain demographic associations with breastfeeding. In a 1999 study of 34,435 children under six months of age living in 111 municipalities in the state of Sao Paulo, a survey was administered investigating feeding practices during the first year of life. The results of this study showed a greater chance of exclusive breastfeeding in women between 25 and 29 years of age, with tertiary education, who had female babies, and who had follow-up in a private healthcare facility (Venancio 2005). In another 2005 cross-sectional study of 376 women with infants 0–6 months attending maternal and child health clinics in Accra, Ghana, EBF was associated with delivery at hospital/polyclinic, the mother having secondary school education, intention to exclusively breastfeed prior to delivery, owning a home, and having a positive attitude towards EBF (Aidam 2005). In a 2009 study 1,142 mothers of children under 6 months in Ethiopia, EBF was associated significantly with maternal educational level, current marital status, child age, and economic status (Aleyemehu, et. al 2009).

The majority of the current literature on determinants of EBF, such as those aforementioned, appears to reveal general associations with the behavior. While such studies may help us to understand who in the target population is more likely to adopt EBF (e.g. mothers under 25 or older than 29, mothers with female babies), and the effectiveness of interventions which have already been carried out (e.g., promoting delivery at a hospital or clinic), these studies are not very helpful in understanding in-depth beliefs and perceptions that constrain the adoption of a desired behavior. Beliefs and perceptions can certainly be crucial in the adoption—or non-adoption—of a behavior. For example, according to interviews conducted in 2009 in Monrovia, Liberia where exclusive breastfeeding is practiced by only 35 percent of mothers, a number of breastfeeding myths have affected mothers' choices not to breastfeed. These myths include beliefs that children can get sick if they are breastfed while the father is having an affair, that women should not breastfeed if a previous child has died while breastfeeding, and that breastfeeding over time is dangerous as breast milk can mix with blood (IRIN 2009).

More helpful formative research attempts to understand key perceptions which are either barriers or incentives to adopting breastfeeding practices. For example, in 2008, Food for the Hungry conducted a BA study in Mozambique of 90 mothers of children 0-11 months of age—45 “Doers,” mothers who practiced exclusive breastfeeding, and 45 “Non-doers,” mothers who did not practice exclusive breastfeeding. In this study, the key determinants of EBF were perceived social acceptability (58% of Doers believed friends, aunts, sisters & parents would approve, as opposed to 24% of Non-doers); perceived advantages (42% of Non-doers expressed there were no advantages at all to EBF, as opposed to 0% of doers); perceived self-efficacy (84% for Doers, versus 42% for Non-doers); and perceived divine will² (69% of Doers, versus 29% of Non-doers). The results and longer-term outcomes of this Barrier Analysis study in Mozambique will be discussed further in the results discussion section of this paper.

Project Tubaramure overview

This research provides guidance to a project called *Tubaramure*, which means “Let’s help them grow” in Kirundi, the major language used in Burundi. The project’s title reflects the community’s central role in achieving the program’s objective. The main funding source for *Tubaramure* is the USAID Food for Peace (FFP) Office, which granted Title II funding for a five-year initiative to prevent maternal and child malnutrition. This new approach promoted by FFP, *Preventing Malnutrition in Children Under Two*, targets pregnant, lactating women, infants and children up to the age of two years. This preventative approach to malnutrition children under two years of age reflects a major shift in FFP’s focus, which had previously operated by identifying children under five years of age who are underweight and targeting interventions toward them. This policy shift was based primarily on evidence from a maternal and child nutrition study in Haiti conducted by IFPRI, Cornell University, World Vision-Haiti, and FANTA which revealed that preventative approaches for children under two was the most effective means of preventing childhood malnutrition (Ruel 2008). Project

² Defined here as the belief that God (or the gods) are in favor of doing the desired behavior. This determinant was added to the Barrier Analysis method by Food for the Hungry after seeing how religious beliefs affected behaviors in the communities where they worked, and is now always a component of BA studies.

Tubaramure is a Multi-Year Assistance Program Proposal awarded by USAID to the partnership between Catholic Relief Services, Food for the Hungry, and International Medical Corps. The project also receives technical and research assistance from the Academy for Educational Development's FANTA program, as well as from the International Food Policy Research Institute (IFPRI).

The overall goal of *Tubaramure* is to prevent malnutrition for children under age two in Burundi. Over five years, the project aims to target 57,195 mother-child units from pregnancy to age 23 months in Cankuzo, Kirundo, Muyinga and Ruyigi provinces, which have experienced increased food insecurity due to climactic anomalies, an influx of returned refugees from Tanzania following expulsion, and a lack of quality health and nutrition services. While the *Tubaramure* project is wide in scope, this paper will focus on behavior change as it relates to the adoption of positive feeding practices. In order to ensure that the *Tubaramure* project interventions will be effective in behavior change, the initial research described in this paper is focused on identifying the key determinants which influence why mothers of nutritionally at-risk children adopt or do not adopt the important nutrition-related behavior of exclusive breastfeeding.

III. Purpose and objectives of study

The main research question investigated in this paper is: ***What are the key determinants of exclusive breastfeeding practices among mothers of children 0-11 months in the Cankuzo and Ruyigi provinces of Burundi?*** More specifically, this research will investigate how certain beliefs and perceptions may affect a mother's adoption or non-adoption of EBF. The perceptions to be investigated are perceptions of susceptibility to malnutrition, severity of malnutrition, social acceptability of EBF, self-efficacy to perform EBF, action efficacy of EBF, divine approval in performing EBF, cues for action, and positive and negative attributes of EBF. The perceptions investigated are further defined in the Table 1.

Table 1: Key Determinants of Exclusive Breastfeeding Defined

Key Determinant	Explanation in the context <i>Tubaramure</i>
Perceived Susceptibility	To what extent a mother believes her child could become malnourished
Perceived Severity	To what extent a mother believes malnutrition is a serious problem
Perceived Social acceptability	To what extent a mother believes people important to her would approve of EBF
Perceived Self-efficacy	To what extent a mother believes she has sufficient knowledge, capacities, and resources to successfully perform EBF
Perceived Action-efficacy	To what extent a mother believes that EBF is effective in preventing malnutrition
Perceived Divine Approval	To what extent a mother believes God (or other divine being[s]) would approve of her practicing EBF
Cues for action	To what extent a mother believes she can remember to practice EBF
Positive & Negative Attributes	Perceived positive and negative attributes of practicing EBF

Main objectives of the study

- Identify key perceptions related to malnutrition and EBF that may determine the adoption of exclusive breastfeeding practices among women of children 0-11 months of age in the Cancuzo and Ruyigi provinces of Burundi
- Propose behavior change-related messages and activities, related to the key determinant findings, which could have the most potential to increase the practice of EBF in Cancuzo and Ruyigi provinces

Through the examination of the aforementioned research question, the Barrier Analysis methodology will also be presented as a helpful rapid-assessment tool for identifying key behavioral determinants of health practices. However, a more in-depth review of the Barrier Analysis methodology merits further discussion in another body of research.

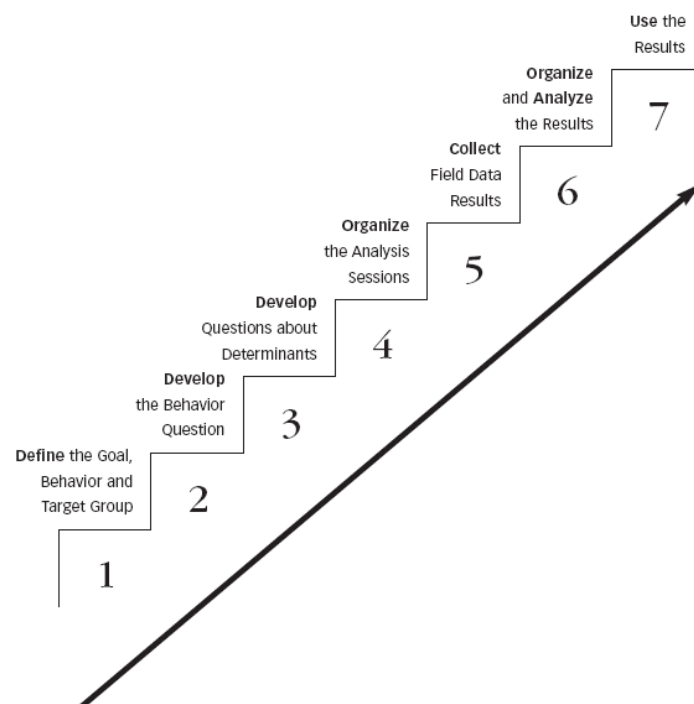
Study and Target Populations

This research supports UNICEF’s recommendations that EBF essentially should be practiced until a child reaches six months of age. However, the study population for this research was defined as mothers of children 0-11 months of age in Cancuzo and Ruyigi provinces in order to have a sufficiently large sample size of mothers who completed the full six months of breastfeeding in the research population. The target population for the corresponding behavior change messaging and activities is mother-child child units from pregnancy to age 23 months, consistent with USAID’s FFP recommendations of focus on preventative approaches for children under two years of age (Ruel 2008).

IV. Study Design and Methodology

While describing the study design used in the *Tubaramure* research performed in December 2009, this section will further explain the key steps in Barrier Analysis. Figure 2 illustrates the major steps in Barrier Analysis:

Figure 2: Steps in a Barrier Analysis Study



Discussion of Barrier Analysis Methodology

The methodology used in this research is known as Barrier Analysis (BA), a rapid assessment tool used in community health and other community development projects to identify behavioral determinants associated with a particular behavior so that more effective behavior change communication messages, strategies and supporting activities can be developed (Davis 2004). The major aim of BA is to help community-level staff members working to better identify barriers to behavior change that—if adopted—would have a significant positive impact on the health, nutrition, or well-being of target populations (Davis 2004).

Barrier Analysis focuses on eight behavioral determinants: perceived susceptibility, perceived severity, perceived action efficacy, perceived self-efficacy, cues for action, perceived social acceptability, perception of divine will, and positive and negative attributes of the desired behavior (*See Table 1 for examples of determinants, as they were addressed in the Tubaramure study*).

Significant scientific literature has revealed that knowledge alone is insufficient to change behavior. Two of the main social and behavioral theories that inform the BA method are the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB). *The Health Belief Model*, also known as a value expectancy model, refers to the assumption that “people will engage in healthy behavior if 1) they value the outcome related to the behavior, and 2) they think that the behavior is likely to result in that outcome (Edberg, 2007, p. 37).” *The Theory of Planned Behavior*, adapted from the formerly known Theory of Reasoned Action, asserts that “people move from attitudes and situations, to attitudes about specific behaviors, and assessments about how the behavior is viewed by others, before they do something. These various stages culminate in an intention to do the behavior (Edberg, 2007, p. 39).”

In order to effectively analyze and apply the research, Barrier Analysis also incorporates aspects of AED’s Doer/Non-Doer Analysis and the BEHAVE Framework. A Doer/Non-Doer Analysis compares people who perform a particular health behavior (“Doers”) with people who do not perform the behavior (“Non-Doers”), and investigates possible determinants as to why people are choosing to be Doers or Non-Doers, such as whether the behavior is perceived as easy or popular (Smith et. al). This particular type

of analysis is often used to identify specific factors which would be key in social marketing planning. The BEHAVE framework developed by AED is essentially a focused worksheet which helps program planners to break down reasons behind a behavior rather than simply relying on assumptions. The framework is based upon the assumption that *before* planning any kind of intervention, three essential questions must be asked: “1) *Who is the audience of the intervention, and what is important to them?*, 2) *What do we want the audience to do?*, and 3) *What are their perceptions about the behavior, and are these determinants that the program can act upon?*.” After answering these key questions, program planners can then ask the last key question of the BEHAVE framework: “*What interventions will you implement that will influence these determinants so that the determinants, in turn, can influence the behavior?*” (Smith, et. al., p.15). For a sample BEHAVE framework developed by the *Tubaramure* staff, see Appendix C.

Table 2 summarizes the key social and behavioral theories and tools which are an integral part of Barrier Analysis.

Table 2: Social & Behavioral Theories and Tools used in Barrier Analysis

SOCIAL & BEHAVIORAL THEORY/ TOOL	EXPLANATION
Health Belief Model	Focuses on six major determinants: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues for action, perceived self-efficacy (Edberg 2007)
Theory of Planned Behavior	Incorporates components such as attitudes, subjective norms, behavioral intentions, perceived behavioral control, and perceived power (Edberg 2007)
AED’s BEHAVE / Designing for Behavior Change Framework	Guides the development of behavior change interventions by clearly defining the target audience, actions, determinants, and activities (Hanlon et al. 200)
AED’s Doer/Non-Doer Analysis	Allows comparison between people who do a desired behavior and those who do not, by using determinants (namely, perceived consequences, self-efficacy, and social norms) in order to identify important differences that can be factors in social marketing (Smith et al. 2008)
FH’s Barrier Analysis	Incorporates all of the above. Has several similarities with AED’s Doer/Non-Doer Analysis, but focuses on a broader list of additional possible determinants and barriers (including perceived susceptibility, severity, divine will, and action efficacy) (CORE Group 2010)

Barrier Analysis was initially developed in the early 1990s using behavior change principles applied to a community-level child health project in the Dominican Republic. It was developed by Tom Davis of FH who felt that other existing formative research methods were too staff-, time- or technology-intensive, and did not explore important determinants of the HBM and Theory of Reasoned Action (a precursor to the TPB) models, and therefore not always practical or helpful in NGO-run field settings. The tool has since been adopted by other organizations such as Catholic Relief Services, Helen Keller International, JHPIEGO, and Medical Teams International. It has been implemented in at least 22 countries (Angola, Bangladesh, Bolivia, Burundi, DRC, Dominican Republic, Ethiopia, Guatemala, Guinea, Haiti, Indonesia, Kenya, Liberia, Mali, Malawi, Mozambique, Nigeria, Sierra Leone, South Africa, Uganda, the United States, and Zambia). In these varying contexts, BA has been used to discover key barriers to behavior change regarding behaviors such as breastfeeding, certain nutritional practices, latrine use, agricultural practices, HIV/AIDS behaviors, sanitation and hygiene practices, water purification, feeding frequency, feeding a non-hungry child, sexual abstinence, sexual faithfulness, use of maternal health services, infant and young child feeding practices, and use of insecticide treated mosquito nets (ITN)/long-lasting insecticidal nets (LLIN).

Perceived divine will in BA is an interesting addition to more commonly studied behavioral determinants, which often goes easily overlooked in other methodologies, but is a consistent component of BA studies. In support of this, a 2005 study performed by USAID's Displaced Children and Orphans Fund which sought to understand key components of successful psychosocial interventions in Ethiopia, discovered that promoting "faith in God" was among the most frequently stated key components of successful interventions (Shah et al. 2005, p.37). It is notable that in the Western world, incorporating spiritual development is often undervalued, while in many African societies, it is most frequently an assumed aspect of one's life. Particularly in Africa, where spirituality is central to most cultures, it "must be considered in the development of effective, culturally specific interventions (Berry 1992, p. 91)." Burundi is a strongly religious country, with estimates indicating that 60% of the country is Catholic, 10% Muslim, and the rest belonging to various other Christian religions or traditional

religions. The extent to which Burundians understanding of divine will actually affects their adoption of health behaviors is worthy of further investigation.

Data Acquisition in Tubaramure's Barrier Analysis Study

In preparation for the BA study, an intensive training was conducted December 1-4, 2009, for 22 project staff from Food for the Hungry, International Medical Corps, Caritas and Catholic Relief Services on behavior change, Barrier Analysis, and interviewing techniques. It was facilitated by Tom Davis, MPH, Food for the Hungry's Senior Director of Health Programs, and Josephine Francisco, MA, George Washington University MPH candidate, and International Rescue Committee-DC's Health Program Manager. (*See Appendix B for an overview of training objectives.*) The workshop content was designed to simultaneously train project staff on Barrier Analysis and allow a venue to work on components of two BA studies. After completing the workshop, participants displayed a 50 percent improvement in demonstrated knowledge of behavior change communication, Barrier Analysis, and interviewing techniques, based on pre- and posttests for 22 staff.

▪ Step 1: Define the Goal, Behavior, and Target Group

During this first step in the BA study, participants focus on choosing a behavior to investigate and a target group that is strategic in reaching their overall goal. The *Tubaramure* goal, in line with the USAID Title II funding, is to reduce malnutrition in children under two years of age. Before the *Tubaramure* BA study officially began, another formative research activity was conducted in order to better understand and address possible causes of malnutrition in the program areas. A Local Determinants of Malnutrition (LDM) Study was initially conducted in August 2009, facilitated by Tom Davis, FH's Senior Director of Health Programs, and Julie Hettinger, FH's Maternal and Child Nutrition Specialist. From this August 2009 LDM study (Davis et. al. 2010), ten local determinants of malnutrition were identified with significant or nearly significant results ($p\text{-value} < .06$), as described in Table 3 below.

Table 3: Local Determinants of Malnutrition Formative Research Findings, August 2009

1. Child feeding practices
2. Foods consumed by the mother during breastfeeding
3. Specific foods consumed by the child
4. Childcare practices
5. Healthcare seeking behavior and home management of sick children
6. Mother/caregiver's acceptance of (and responsiveness to) child
7. Mother/caregiver's support network
8. Hygiene practices
9. Consumption of particular nutrients
10. Mother's income-generating work

Initial findings from this study informed the choice of the focus for the two December 2009 BA studies on immediate breastfeeding (IBF)³ and exclusive breastfeeding. The LDM study found that mothers of children who were not malnourished (WAZ>-1) were much more likely to have breastfed their child within the first hour after birth (OR=0.34, p=0.03). While no statistically-significant association was found between EBF and malnutrition in this particular study, IFPRI recommended Food for the Hungry to conduct a BA study on EBF as well, given its association with good nutrition in many other contexts.

Exclusive breastfeeding and immediate breastfeeding were thus the two behaviors explored in the December 2009 BA studies in Burundi. The target group chosen for the initial research on EBF and IBF was women of children 0-11 months of age. (*For a description of target group in the Designing for Behavior Change Framework developed by program staff, see Appendix C.*) However, to simplify the presentation of the research, only EBF will be discussed in this research paper. Mothers of children ages 0-11 months comprised the study population, but corresponding interventions, which are related to additional child feeding practices other than just EBF, essentially will be targeted to pregnant mothers of and mothers of children 0-23 months.

▪ **Step 2: Develop the Behavior Question**

Clearly developing the behavior question is the next important step in Barrier Analysis because it helps us to define who would be a Doer and Non-doeer in the study.

³ Defined as putting a newborn baby to the mother's breast within 1 hour of birth

In the *Tubaramure* BA study, the behavior question was defined as: Women of children 0-11 months of age who give (or gave) only breast milk—no other food or liquids—to their infants below 6 months of age. Hence, Doers were identified as those who give (or had given) only breast milk—no other food or liquids—to their infants below 6 months of age. And Non-doers were defined as those who give (or had given) foods or liquids in addition to breast milk to their infants below six months of age.

▪ Step 3: Develop Questions about Determinants

In BA, participants are asked a series of questions to identify eight potential determinants (see Table 1, p.16) that can block people from taking an action that will improve their own or their children’s lives (e.g., exclusive breastfeeding to improve a child’s nutrition), or make it more likely that the person will do the healthy behavior (as in the case of the determinant “positive attributes of the behavior”). Specific questions are associated with each determinant. For example:

(*Susceptibilité Perçue*) [Perceived Susceptibility]

6. Si un enfant âgé de moins de 6 mois n’est pas exclusivement allaité(e) aux seins, pensez-vous qu’il/elle peut devenir malnutri?

Hamwe umwana afise amezi ari musu y’atandatu atokwonswa ibere ryonyene gusa, mbega wiyumvira ko ivyo vyoshobora gutuma afatwa n’ingwara zivuye ku gufungura nabi ?

[If a child 6 months or younger in age is not exclusively breastfed, do you think that he/she could become malnourished?]

- a. Oui (*Ego*) [Yes]
- b. Possible (*Birashoboka*) [Maybe]
- c. Non (*Oya*) [No]
- d. Je ne sais pas (*Sinzi*) [I don’t know]

Questionnaires combine closed-ended and open-ended questions, and gather information about mothers’ self-reported perceptions of the condition or problem (in this case, malnutrition) and the promoted behavior (in this case, EBF).

For the *Tubaramure* BA study, the questionnaires included a combination of writing new questions and adapting questions from previous BA studies. Questions were translated into both French and Kirundi. While this was primarily completed before the BA training, the training was also used as a forum for program staff to critique and

improve questions as well as translations. (See Appendix D for the EBF questionnaire used during December 2009 BA study in Burundi.)

The questionnaires also began with a brief informed consent, which included the goals of the research and the basic rights of the interviewees. The study design, questionnaire, and informed consent were reviewed and approved by the George Washington University's Office of Human Research (See Appendix E for IRB Approval.) The informed consent was translated into French and Kirundi, and program staff was trained on how to administer it appropriately.

▪ Step 4: Organize the Analysis Sessions

This step includes the logistics of how the data was collected and analyzed. For this study, Cancuzo and Ruyigi provinces were chosen, two of the most impoverished provinces of Burundi where the project would be intervening. FH Burundi staff facilitated details of travel of two teams of staff who normally resided in Bujumbura – one team to Ruyigi supervised by Tom Davis, and another team to Cancuzo supervised by Josephine Francisco. The project staff who served as interviewers for this study had not yet worked in these project communities, and had no previous relationships with the mothers with whom they interviewed. Health promoters from the communities who are part of project staff helped in recruiting and organizing mothers on the day of the sessions.



Provincial Map of Burundi, 2010

▪ Step 5: Collect Field Data for Barrier Analysis

Collecting field data for BA is done through individual interviews. BA studies usually include approximately 45 Doers and 45 Non-Doers. FH has found from experience that with approximately 45 Doers and 45 Non-Doers, at least 2-3 statistically significant findings are usually discovered with at least a 10 point difference or more between Doers and Non-doers (i.e., finding a statistically-significant difference between 45% Doers and 34% Non-doers), and avoids showing statistically significant findings on items wherein the difference between Doers and Non-doers is small and hence not very

notable (e.g., finding differences between 40% Doers and 44% Non-doers with an OR of 1.10) (Davis 2009, pers. comm., October 15, 2009).

The December 2009 fieldwork research included a survey of 45 Doers and 49 Non-Doers of exclusive breastfeeding in Cancuzo and Ruyigi provinces. While it was done simultaneously with a study on immediate breastfeeding (for which another 45 Doers and 45 Non Doers were interviewed) this research paper will focus only on the exclusive breastfeeding study and findings. In Cancuzo and Ruyigi provinces, a total of 16 *collines*⁴ were visited for the research study. Upon arrival on site at the *collines*, a pre-screening process was first conducted to determine whether mothers were part of the target population and whether they were Doers or Non-Doers of the behavior. Trained project staff conducted the interviews in Kirundi, separated from others for confidentiality, and had their results reviewed by a supervisor before submission.

▪ **Step 6: Organizing and Analyzing the Results**

Very soon after data is collected from a BA study, the results should then be organized and analyzed, and may be done with the help of trained field staff. In the *Tubaramure* BA study, data was first tabulated manually while in the field by trained project staff and health promoters during the two days immediately following data collection. Tom Davis and Josephine Francisco then compiled results from Cancuzo and Ruyigi provinces. Results discussed in this paper reflect data from the two provinces combined.

To analyze data in a BA study, percentages of responses of Doers and Non-doers should be compared for each response. If Doers and Non-doers have similar percentages for any item, the item is not likely to be a determinant of the behavior. For example, in the *Tubaramure* study, 93% of Doers and 94% of Non-doers said that they believed malnutrition was a very serious condition. Because these percentages are very similar, and the calculated p-value $>.05$ (indicating that the finding is not statistically significant), perception of the severity of the condition is most likely not a driver of the behavior. On the other hand, only 2% of Doers said that they do not think that a child who is not exclusively breastfed could become malnourished, as compared to 33% of the Non-Doers (p-value $<.001$). These notably dissimilar percentages imply that this item—perceived

⁴ Literally, “hill” in French; refers to a community smaller than the Burundian commune

action efficacy (i.e. the mothers' perception that EBF "works" to prevent malnutrition)—*is* likely to be an important determinant of the behavior.

BA data, when collected is then inputted into a Barrier Analysis excel spreadsheet which calculates odds ratios and p-values, and which in turn aids in identifying significant findings ($p < .05$) to study and interpret. (*See Appendix A for the BA spreadsheet used for this study.*)

▪ **Step 7: Use the Results of Barrier Analysis**

In BA, after organizing the data from the analysis, the final and crucial step is to decide how the results will help to inform program design, behavior change messages and activities, and target groups chosen for health promotion. For *Tubaramure*, project staff reconvened in Bujumbura immediately after the field work research, inputted their findings into Designing for Behavior Change (DBC) Frameworks, and discussed possible usage of BA results. As a group, the team identified possible key determinants of EBF based on their research, and discussed possible project activities and key messages. (*See Appendix C for a sample DBC Framework created collaboratively with Tubaramure staff.*)

V. Presentation of Results

A total of 94 respondents' answers were tabulated, 45 Doers and 49 Non-doers. Upon examining inputted results into the BA spreadsheet, the following items had significant findings ($p < .05$): perceived action-efficacy, perception of divine will, perceived social acceptability, perceived self-efficacy, perceived negative attributes of the action, and cues for action. Table 4 summarizes the statistically significant key determinant finding for this study.

Table 4: Statistically Significant Findings from Tubaramure’s Barrier Analysis study

Determinant	Question & Answer	% Doers	%Non-doers	Odds ratio
Perceived action efficacy	Q: “Do you think that exclusive breastfeeding a child until the age of 6 months could help him/her from becoming malnourished?” A: <i>No</i>	2%	33%	.05 (p-value < .001)
Perceived Divine Will	Q: “Do you think that God approves of mothers exclusively breastfeeding their children until the age of 6 months?” A: <i>No</i>	2%	29%	.06 (p-value < .001)
Perceived Social Acceptability (General)	Q: “In your opinion, would most of the people you know approve of you exclusively breastfeeding your child?” A: <i>Yes</i>	78%	53%	3.1 (p-value = .01)
Perceived Social Acceptability (Specific persons)	Q: “Who are the people who would approve of you breastfeeding your child?” A: <i>Mothers-in-law</i>	18%	2%	10.4 (p-value = .01)
	A: <i>Husband</i>	89%	55%	6.5 (p-value < .001)
	A: <i>Cousins</i>	20%	4%	5.9 (p-value = .02)
	A: <i>Mother</i>	58%	27%	3.8 (p-value = .002)
Perceived Self-Efficacy	Q: “With your current knowledge and abilities, do you think you would be able to exclusively breastfeed your next child until the age of 6 months?” A: <i>Yes</i>	87%	45%	7.98 (p-value < .001)
Perceived Negative Attributes of the Action	Q: “What are the disadvantages of exclusively breastfeeding your child?” A: <i>An exclusively breastfed child will always be hungry</i>	2%	14%	0.14 (p-value = .04)
Cues for action	Q: “If you wanted to exclusively breastfeed your child until the age of 6 months, would it be difficult to remember to not give your child other foods or liquids other than breast milk?” A: <i>Not at all difficult</i>	80%	39%	6.3 (p-value < .001)

These identified behavioral determinants are considered in our findings as the key determinants of exclusive breastfeeding for women of children 0-11 months in Cancuzo and Ruyigi provinces.

- **Key Determinant: Perceived action-efficacy:** 33% of Non-Doers, as opposed to only 2% of Doers responded “no” to the question, “*Do you think that exclusive breastfeeding until the age of 6 months could help your child avoid becoming malnourished?*” Non-Doers were 21 times less likely to say that a child who does not EBF will become malnourished.
- **Perception of divine will:** 29% of Non-Doers, as opposed to only 2% of Doers responded “no” to the question, “*Do you think that God approves of mothers exclusively breastfeeding their children until the age of 6 months?*” Non-Doers were 17.6 times more likely to say they think God does not approve of EBF.
- **Perceived social acceptability:** 78% of Doers, as opposed to 53% of Non-Doers, answered “yes” to the question, “*In your opinion, would most of the people you know approve of you exclusively breastfeeding your child?*” Doers were 3.1 times more likely to have a positive response than Non-Doers regarding whether or not they felt their social networks would approve of EBF. When asked the follow-up question, “*Who are the people who would approve of you breastfeeding your child?*,” Doers were 10.4 times more likely than Non-Doers to say that their mothers-in-law approved of EBF, 6.5 times more likely than Non-Doers to say that their husbands approved of EBF, 5.9 times more likely than Non-Doers to say their cousins approved of EBF, and 3.8 times more likely to say their mothers approved of EBF.
- **Perceived self-efficacy:** 87% of Doers, as opposed to 45% of Non-Doers, responded “yes” to the question, “*With your current knowledge and abilities, do you think you would be able to exclusively breastfeed your next child until the age of 6 months?*” Doers were 8 times more likely to say that they could practice EBF with the appropriate knowledge and abilities.
- **Perceived Negative Attributes of the Action:** Upon asking mothers the open-ended question of “*What are the disadvantages of exclusively breastfeeding your child?*” 14% of Non-Doers, as opposed to 2% of Doers, said that a child who is exclusively breastfed

will always be hungry. Non-Doers were 7.3 times more likely to say that a child who is exclusively breastfed will always be hungry.

- ***Cues for action:*** In response to the question, “If you wanted to exclusively breastfeed your child until the age of 6 months, would it be difficult to remember to not give your child other foods or liquids other than breast milk? Very difficult, difficult, a little difficult, or not difficult at all?” 80% of Doers, as opposed to 39% of Non-Doers said it would be “not difficult at all.” Doers were therefore 6.3 times more likely to say that it is not difficult at all to remember to practice EBF.

VI. Discussion of Results

The results of this research indicate that perceived action-efficacy, perception of divine will, perceived social acceptability, perceived self-efficacy, perceived negative attributes of the action, and cues for action may be the key determinants to mothers’ adoption of EBF.

First, the results indicate that most Doers possess certain perceptions not shared by most Non-doers, which are clues into Doers’ adoption of EBF. First, Doers were considerably more convinced certain significant persons in their lives approved of EBF. Doers were 10.4 times more likely to say their mothers-in-law approved of EBF, 6.5 times more likely to say their husbands approved of EBF, 5.9 times more likely to say their cousins approved of EBF, and 3.8 times more likely to say their mothers approved of EBF. These findings indicate that mothers-in-law, husbands, cousins, and mothers seem to be key people in supporting mothers’ beliefs about EBF being a socially acceptable practice. Their perception of social acceptability of EBF may be a causal factor of their choosing to adopt the behavior, being 3.1 times more likely than Non-doers to believe that their social networks in general would be supportive of EBF. Doers also were 8 times more likely to say they could practice EBF with the appropriate knowledge and abilities, self-reporting a significantly higher perception of their self-efficacy to practice EBF as compared to Non-Doers. Additionally, with Doers 6.3 times more likely to say that it is not difficult at all to remember to practice EBF, an evident barrier for

Non-Doers is that they seem to be simply forgetting to not give other foods or liquids to their babies.

Results also displayed that Non-Doers possess certain perceptions dissimilar from those of Doers which may be key barriers to their successful adoption of EBF. First, mothers who do not exclusively breastfeed were 21 times less likely to say that a child who does not exclusively breastfeed will become malnourished. They have a remarkably low perceived action-efficacy of EBF, meaning they do not seem to be making the link between malnutrition and not practicing exclusive breastfeeding, or they do not find exclusive breastfeeding to be effective in preventing malnutrition.

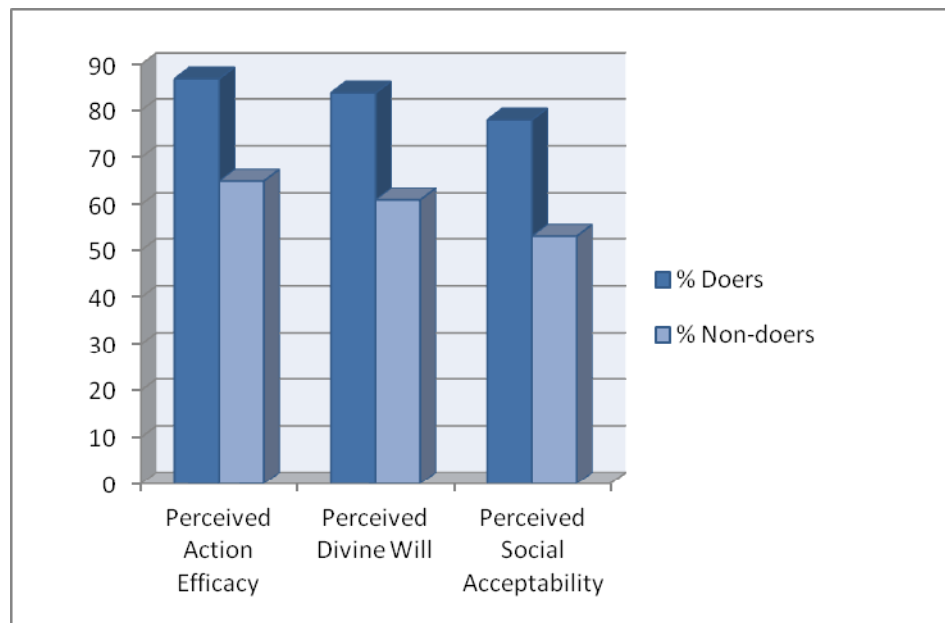
Interestingly as well, Non-Doers were 17.6 times more likely to say that God does not approve of EBF. Burundi is a deeply religious country and people's beliefs in God—including how they believe God wants them to behave—are not to be dismissed. However, changing people's perceptions of God's will is, of course, a delicate issue, particularly when the project staff must respect certain rules given the use of US government funding. Nonetheless, in speaking with Burundian staff, they found addressing the topic directly to not be offensive at all, as may be assumed in a Western context. This finding merits further research as to why so many Non-doers may believe God does not approve of EBF, in order to develop effective related activities. Finally, Non-Doers were 7.3 times more likely to say that a child who is exclusively breastfed will always be hungry. It is notable here that a frequently reported perceived disadvantage of EBF is an actually a false belief, namely the belief that EBF does provide fully sufficient nutrients for a baby.

Identifying key determinants in the *Tubaramure* project helps us to understand some of the key barriers women are facing in the adoption of exclusive breastfeeding, as well as other ideas that may be useful in promoting the behavior (e.g. targeting mother-in-laws). The results from this study are intended to have more immediate implications for informing *Tubaramure*'s programming, especially in terms of helping program staff to design behavior change messages and activities which effectively change the perceptions identified as the greatest barriers to adopting exclusive breastfeeding. While some of these perceptions are false (e.g., the belief that EBF does not help avoid malnutrition), many of the perceptions indicate the presence of very real situations in the mothers' lives (e.g., unsupportive family members) wherein mothers need additional

support to effectively adopt the behavior. Possible recommendations as to the use of the results will be discussed here.

While there were several statistically-significant findings from the study, in the next section we will focus on potential programming recommendations with relation to three of the determinants with odds ratios the furthest from 1.0, namely: perceived action efficacy (OR=.05), perception of divine will (OR=.06), and perceived social acceptability (OR=3.1). In each of these determinants, we also see the significant difference between the percentages of Doers and Non-Doers, as illustrated in Figure 3.

Figure 3: Select Key Determinants of EBF



Programming Recommendations based on Tubaramure’s Barrier Analysis Study

The following recommendations reflect the author’s recommendations, Food for the Hungry/US staff recommendations, and Burundian *Tubaramure* staff recommendations, whose experience and insight as to the appropriateness of certain interventions have been truly invaluable. The recommendations focus on suggested activities related to key factors: 1) to increase the percentage of mothers who believe that a child who is not exclusively breastfed can become malnourished, 2) to increase the percentage of mothers who believe that God approves of EBF, and 3) to increase the percentage of mothers who

believe that their mother-in-laws, husbands, cousins, and mothers approve of EBF. Additionally, this section will discuss recommendations based on frequently mentioned answers to open-ended questions, as well as recommendations for the further usage of Barrier Analysis. *(For the full Designing for Behavior Change (DBC) framework including Tubaramure staff's recommendations on possible activities related to the key determinant findings, see Appendix C.)*

Table 5: Summary of Findings, Key Factors, and Recommendations

KEY DETERMINANT	FINDING	KEY FACTOR	RECOMMENDATIONS
Perceived Action Efficacy	Mothers who do not exclusively breastfeed were 21 times less likely to say that a child who does not exclusively breastfeed will become malnourished.	Increase the % of mothers who believe that a child who is not exclusively breastfed can become malnourished	<ul style="list-style-type: none"> ▪ Track and expose to the communities positive deviants who faithfully practice EBF and who also have healthy, well-nourished babies. ▪ Provide peer-based lactation counseling to help women understand the importance of EBF in combating malnutrition. ▪ Utilize trainings of trainers to educate health promotion trainers on how to effectively demonstrate the link between EBF and good nutrition.
Perceived Divine Will	Mothers who do not exclusively breastfeed were 17.6 times more likely to say that God does not approve of EBF.	Increase the % of mothers who believe that God approves of EBF	<ul style="list-style-type: none"> ▪ Mobilize spiritual leaders, who are often leaders in many other ways, to show support for EBF practices. ▪ Give pastors and priests sermon guidelines related to breastfeeding practices and good nutrition.
Perceived Social Acceptability		Increase the % of mothers who believe that their mother-in-laws, husbands, cousins, and mothers approve of EBF	<ul style="list-style-type: none"> ▪ Use radio broadcasts featuring mothers-in-law, husbands, cousins, and mothers who support EBF. ▪ Train some of these key groups (mothers-in-law, female cousins, and mothers) to be health promoters for the community.

Recommendations for Targeting Perceived Action Efficacy of EBF

Key Factor: Increase the percentage of mothers who believe that a child who is not exclusively breastfed can become malnourished.

Suggested Activities:

- *Track and expose to the communities positive deviants who faithfully practice EBF and who also have healthy, well-nourished babies.* Positive deviance is based on the belief that, “in every community there are certain individuals or groups whose uncommon behaviors and strategies enable them to find better solutions to problems than their peers, while having access to the same resources and facing similar or worse challenges (Tufts University 2010).” By identifying and observing positive deviants of the EBF behavior, the community is then given the opportunity to together develop problem solving approaches. Positive deviance is “one of the most sustainable and culturally relevant ways to change behavior because it builds on existing strengths and resources within the community in which it is used” (Murphy 2005, p.13). A suggested activity using this approach is to highlight the behavior of positive deviants of EBF, and compare their weight for age with other babies who are not exclusively breastfed. The purpose of this activity would be to demonstrate the link between EBF and prevention of malnutrition.
- *Provide peer-based lactation counseling to help women understand the importance of EBF in combating malnutrition.* Several studies in the literature confirm the positive effects of various forms of lactation counseling in the adoption of EBF. For example, in a 2005 study in Ghana, results showed the positive effects of lactation counseling on the adoption of exclusive breastfeeding. In this study, 39.5 percent of the 79 mothers in the intervention group between 25 and 29 years practiced exclusive breastfeeding since birth, as opposed to only 19.6 percent of the 44 mothers in the control group. Thus, the lactation counseling intervention was associated with a doubling of EBF rates (Aidam 2005). In a 1996 community-based randomized trial of breastfeeding promotion of 130 women in Mexico which investigated the efficacy of home-

based peer counseling to promote exclusive breastfeeding, the duration of exclusive breastfeeding was significantly longer in intervention groups than in controls. Additionally, 12 percent of infants in the intervention group versus 26 percent of infants in the control group had an episode of diarrhea (Morrow et. al. 1999).

- *Utilize trainings of trainers to educate health promoters on how to effectively demonstrate the link between EBF and good nutrition.* For example, the Linkages Project's *Training of Trainers for Negotiating Sustainable Behavior Change* has a manual, "Behavior Change for Improved Infant Feeding," which provides health promoters with learning objectives, lesson plans, and activities to aid them in effectively training others on behavior change of infant feeding issues, including EBF (Linkages 2004). Some relevant activities include games to help understand child, mother, family and community benefits of breastfeeding, as well as role-plays to train health promoters how to counsel other mothers about the links between child health and proper breastfeeding practices. Another helpful training course is the 40 hour breastfeeding counseling course developed by WHO/UNICEF, which has shown proven means of increasing participants' knowledge of breastfeeding, as well as counseling skills (Rea et. al 1999).

Recommendations for Targeting Perception of Divine Approval of Exclusive Breastfeeding

Key Factor: Increase the percentage of mothers who believe that God approves of EBF

Suggested Activities:

- *Mobilize spiritual leaders, who are often leaders in many other ways, to show support for EBF practices.* The guidance of spiritual leadership is sought often not only in a religious context, but for other matters as well, including health decisions. Mobilizing spiritual support to show their support of EBF may be a key strategy in helping mothers to believe that God would indeed approve of EBF. Similar strategies have been proven to be successful in various other contexts, for example, with mobilizing religious leaders in addressing family

planning interventions in the Middle East. As another example, Family Health International's work in Cambodia with Buddhist monks and Muslim imams was particularly effective because of the monks' high esteem in Khmer culture (Sachs 24). It would be important in the context of *Tubaramure* to maximize networks in the faith community in order to show full support of EBF. As both CRS and Food for the Hungry are faith-based organizations with linkages to several networks in the Burundian faith community, it is important to mobilize these spiritual leader contacts in the effective promotion of EBF.

- *Give pastors and priests sermon guidelines related to breastfeeding practices and good nutrition.* Hearing about EBF in a familiar religious context (such as a Sunday sermon) may be a key way for mothers to have an improved perception of God's approval of EBF. This strategy has been successfully adopted by other USAID-funded projects, as seen in IMA World Health's Publications of: *Muslim Khutbah Guide to Save the Lives of Mothers and Newborns: A Toolkit for Religious Leaders* and *Christian Sermon Guide to Save the Lives of Mothers and Newborns: A Toolkit for Religious Leaders*. These publications give relevant sermon guides using contextualized religious stories to spiritual leaders with the aim of giving them the tools to mobilize their constituencies on safe motherhood. The basis of such publications is that faith communities have the widest reach of any social institution and are deeply embedded in the lives of the most remote, marginalized and poor communities (IMA 2009).

Recommendations for Targeting Perception of Social Acceptability

Key Factor: Increase the percentage of mothers who believe that their mother-in-law, husband, cousins, and mother approve of EBF.

Suggested Activities:

- *Use radio broadcasts featuring mothers-in-law, husbands, cousins, and mothers who support EBF.* Broadcasts may include songs, dramas, interviews, testimonies, etc. during which these key people describe why they support EBF. As an example of a similar intervention which was received with success, the Linkages Project worked closely with local broadcasters in Ghana to deliver

approximately 500 radio broadcasts about breastfeeding over the course of four years (Martin 2003). Messages should be developed to specifically call upon the unique roles and responsibilities of the key groups. Indeed, significant research on effective EBF interventions has shown the importance of focusing on communities, and not just the lactating mothers. For example, a study conducted on Honduran mothers' key perceptions of mothers related to EBF, corroborated the need for messages to target whole communities, not just mothers in order to effectively promote behavior change messages (Cohen, et. al. 1999)

- *Train some of these key groups (mothers-in-law, female cousins, and mothers) to be “Leader Mothers.”*⁵ These “Leader Mothers” would be key in not only modeling the behavior (if lactating), but also teaching mothers through workshops and possibly the use of counseling cards which have been effective in other African contexts to transmit key messages in pictures and simple stories (Martin 2003). These “Leader Mothers” would also be strategic in persuading mothers in regards to the first key determinant, that practicing EBF does indeed promote better nutrition, as well as provide mentoring and supervision to the mothers in the target population.

Additional Recommended Messages to “Sell” Exclusive Breastfeeding

In BA, the Doers' responses—particular the open-ended ones—may help to understand additional strategies on how to make the behavior easier or more appealing, and also could provide ideas for messages that could be effective with Non-Doers. The following are examples of open-ended responses which have given program staff keys into local perspectives: In Cancuzo province, 38% of Doers, as opposed to 13% of Non-Doers, said that having sufficient mother's milk was among the top things which make EBF easier. Based on this, a health communication message which may be effective would be to promote the idea that adequate breastfeeding practices are indeed within a mother's control, and that any mother can breastfeed a child, regardless of nutritional

⁵ *“Leader Mothers”*: the community-level cadre of health promoters in the Tubaramure project

status. Also, continual suckling and good hydration lead to more milk production. Additionally, staff can use local materials to illustrate to the mother how small the child's stomach is at each stage in development (e.g., an egg sized stone would represent the 70ml capacity of an infant's stomach at 10 days).

In Ruyigi province, 44% of Non-doers, as opposed to 14% of Doers, said that sickness of the mother was one of the things that make EBF difficult. A related health communication message here is to share with mothers that even sick mothers are capable of producing sufficient, nutritious breast milk. Other family members could be encouraged as well to regularly bring the child to the mother for breastfeeding when she is ill (if the child is otherwise not rooming with the mother during illness).

Use of Barrier Analysis in Behavior Change

While the longer-term outcomes of *Tubaramure's* BA research are still to be determined, other BA studies (e.g., the 2007 Mozambique study on EBF) show how BA research could guide efforts in promoting positive behavior change. At the start of the project in Mozambique in February 2006, 17% of infants 0-5 months of age were exclusively breastfed in the last 24 hours. The purpose of study was to help project staff, community members, and especially health promoters to discover behavioral determinants of EBF through interviews with mothers of infants in five districts of Sofala Province, Mozambique. The key determinants found in this study were: social acceptability, perceived advantages, perceived self-efficacy, and perceived divine will.

Behavior change messages and activities were then tailored to focus on the key determinants discovered in the BA study, and by December 2007, 95% of the women in Food for the Hungry's Child Survival project practiced EBF (per a follow-up population-based survey). Significantly as well, the prevalence of malnutrition among the project's target population also decreased, declining from 26.7% of the children underweight to 15.6% underweight in September 2008. With the exception of perceived advantages, the key determinants found in the Mozambique study were also found in the *Tubaramure* BA study. In the case of the Mozambique study, we see how the tailoring of behavior change messages and activities to the key determinants discovered in the BA research may have

been strategic in the subsequent outcomes of increased exclusive breastfeeding rates and decreased malnutrition rates in the target population. Accordingly, it would be important in the *Tubaramure* project to closely use the BA key determinant findings to choose behavior change messages and activities, and thus hopefully lead to the ultimate goals of increasing EBF rates and decreasing malnutrition rates.

As BA is emerging as a more widely used methodology in identifying key determinants in behavior change, follow-up research on its longer-term efficacy would be beneficial. For example, a cluster randomization trial could essentially compare behavior change outcomes in one set of communities (e.g., selected clusters of communities) where BA is used to drive behavior change messages and activities, with a separate set of communities where another traditional formative research method (e.g., focus group discussions) or no formative research, is used to drive behavior change. Alternatively, a rigorous literature review could potentially compare behavior change outcomes from interventions informed by BA, as opposed to other published studies of EBF determinants aforementioned in this report.

Study Limitations

Some of the *Tubaramure* study limitations include possible information bias due to self-reporting, selection bias, or recall bias.

First, the results of BA questionnaires are dependent on the accuracy of mother's self-reporting of their behaviors and perceptions, and furthermore may lead to selection bias or information bias. For example, in Cancuzo province, a number of mothers made reference to a recent radio program educating them about the importance of EBF. Perhaps due to the radio show's education about EBF, many mothers seemed to know that not giving their children breast milk before six months of age was the "correct" answer, and thus finding enough mothers in certain *collines* who reported themselves to be Non-doers in was difficult. Some mothers may have erroneously reported that they practiced EBF since they had heard it is a healthy practice, thus creating the possibility for selection bias. However, this self-reporting is the basis for most population-based data in developing countries, including most questions in the DHS (with a few exceptions

such as vaccination data and vitamin A supplementation data). Additionally, the recruitment and informed consent process made clear to mothers that their participation and responses would not in any way affect certain benefits that they would receive. Nonetheless, some mothers may have reported what they think the interviewers want them to say rather than what they actually do or believe.

While Bujumbura staff worked hard to provide accurate translation and interpretation of questions, certain ambiguities in translation may have led to information bias. For example, in the simultaneous study on immediate breastfeeding, in response to the open-ended question asking, “*What are the problems or illnesses a child could have if they are not put to the breast within one hour of childbirth?*” the Kirundi used by many women was literally translated as they would be “dying of hunger.” There was therefore confusion to categorize the response as “death” or “hunger.” Because the main supervisors of the questionnaire development do not speak Kirundi, detailed supervision of translation efforts was limited. The BA questionnaire, however, was translated by a professional translator with fluency in English, French, and Kirundi, and reviewed by the entire staff of interviewers, and corrections were made based on their input.

Next, choosing a sufficiently-sized target population was challenging without introducing too much potential for additional bias. For example, for mothers of children 6-11 months, reporting was subject to recall bias—mothers simply not being able to remember correctly if they practiced EBF. Realistically, it would be extremely challenging to find enough mothers in the 6.0m to 6.5m age group – which would minimize recall bias – since they represent less than 1% of all mothers of children under five years. Because the study was more concerned with finding differences between mothers who completed EBF through the first six months of their child’s life, the team decided to focus mostly on children 6-11 months of age where possible, and only accepted children under six months of age when very few mothers of children 6-11 months were available for interviews. Furthermore, 18 mothers of children 0-5 months (19% of the sample), and 76 mothers of children 6-11 months (81% of the sample) were included in the study, and thus the study population was generally more illustrative of mothers who at or beyond the 6 month mark. Nonetheless, WHO’s *Indicators for Assessing Breast-feeding Practices*, Wellstart International’s *Tool Kit for Monitoring and Evaluating Breastfeeding Practices*

and Programs, and the DHS reports all calculate EBF using the 24-hour recall method for children 0-5 months, which also may overestimate the proportion of mothers who will make it to the 6 month mark for exclusive breast-feeding.

Recall bias may have also affected mothers of children 6-11 months whose beliefs on certain issues such as advantages and disadvantages of EBF may have changed from when they were breastfeeding their child of 0-5 months of age. They may also incorrectly recall who supported or discouraged them from doing so at the time, or not accurately remember what their beliefs were when their child was less than 6 months of age. However, having a preference for mothers with children under six months of age would have the disadvantage of wrongly classifying a Non-doer as Doer, as the majority of Burundian children are indeed exclusively breastfed at a young age, but with rates dropping significantly between four and six months.

Finally, while one of the strengths of BA is that it is a relatively simple method of research which can easily be taught to program staff in a short amount of time, mistakes in interviewing techniques, how questions were administered to Doers vs. Non-doers, data collection, and errors in tabulation of results could have lead to lower-quality results and information bias. Nonetheless, to minimize this bias, techniques for minimizing bias in the interview process were rigorously taught during the training. Interview supervisors also directly observed some of the interviews and reviewed responses for completion and accuracy.

VII. Conclusion

As both international and local organizations continue to tackle the massive issue of childhood malnutrition in Burundi, it is indeed vital that the formation of effective behavior change messages and activities be based on a solid, locally-informed understanding of why target populations do or do not adopt certain behaviors. Beyond informing the *Tubaramure* project, this type of information is gravely needed in order to bring about the levels of change necessary to reach the Millennium Development Goals which heavily rely on changes in behavior (e.g., MDG #1 [Eradicate extreme poverty and hunger.] and #4 [Reduce childhood mortality.]).

Project *Tubaramure*'s Barrier Analysis research has provided some key insights into perceptions behind mothers' adoption of exclusive breastfeeding, and the next step is to closely link these research findings with solid behavior change activities. First, we see confirmed here the basic tenet that changing health knowledge is not always sufficient to create true behavior change. The key determinants discovered and discussed in this study of perceived action efficacy, perceived divine will, and perceived social acceptability illustrate the different layers of promoting sustainable behavior change. One must understand the unique circumstances and perspectives of an intervention's target population, and be ready to engage them concerning their beliefs and perceptions (both true and false). Additionally, one must be prepared to engage a target population's perceptions about both themselves and others, including their social networks and even their spiritual worldview. Further, behavior change interventions must be ready to lead people from basic knowledge, to supportive attitudes, to improved skills, to practice of the desired behavior, and finally to long-term maintenance of the behavior.

The Barrier Analysis methodology, as exhibited in this study, was an effective means for identifying key behavioral determinants of EBF for Burundian mothers, and has been emerging in various international contexts as a highly-effective program planning tool for the identification of behavioral determinants. BA allows for exploration of local beliefs and perceptions which may be pivotal in driving certain behaviors, thus making formative research not only relevant to the community, but also a community effort. Using formative research methods such as BA can better prepare governments, NGOs, and community-based organizations to assist mothers to overcome real and perceived barriers, and in turn help them in the adoption of life-saving behaviors such as exclusive breastfeeding.

Finally, this research continues to affirm that childhood malnutrition is indeed a crucial issue in the overall development of post-conflict Burundi, particularly as it relates to child survival. *The Lancet* series on child survival identified breastfeeding interventions as having the potential to prevent 13 percent of all under five deaths in developing areas of the world, ranking it as the most important preventative approach for saving child lives (Jones 2003). Additionally, research by FANTA suggests that "reducing the prevalence of low weight-for-age by five percentage points by 2005 could

reduce child mortality by about 30 percent and under-5 mortality by 13 percent” (Pelletier, 202, p. 15-16). In this way, by reducing general malnutrition through key breastfeeding measures, child survival as a whole could be accelerated. Through this research compilation, we furthermore affirm the importance of *Tubaramure*’s work not only in terms of breastfeeding, but on the larger scale of child survival in the rebuilding of post-conflict Burundi.

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Déterminants	Faiseurs : +Exp. (A)	Non Faiseurs: +Exp. (B)	Non-Doers: - Exp. (C)	Doers: - Exp. (D)	Non Doers %	Doers %	Diff.	OR	Interval de Config.		valeur-p
La mère ayant le stress	3	0	42	49	0%	7%	-7%				0.066
L'enfant qui ne réclame pas à manger / appétit de l'enfant	0	3	45	46	6%	0%	6%	0.00			0.092
Rien	4	5	41	44	10%	9%	1%	0.86	0.22	3.42	0.829
Conception (autre grossesse)	5	5	40	44	10%	11%	-1%	1.10	0.30	4.08	0.887
Instruction/conseils (mari)	0	2	45	47	4%	0%	4%	0.00			0.171
Indisponibilité de la mère	0	2	45	47	4%	0%	4%	0.00			0.171
Pauvreté	1	2	44	47	4%	2%	2%	0.53	0.05	6.10	0.608
14. Qui pourrait approuver:											
a. Mari	40	27	5	22	55%	89%	-34%	6.52	2.20	19.33	0.000
b. Mère	26	13	19	36	27%	58%	-31%	3.79	1.59	9.02	0.002
c. Cousines	9	2	36	47	4%	20%	-16%	5.88	1.20	28.88	0.016
d. Voisins	16	13	29	36	27%	36%	-9%	1.53	0.63	3.68	0.344
e. Amis	21	17	24	32	35%	47%	-12%	1.65			0.237
f. Autres	23	31	22	18	63%	51%	12%	0.61	0.27	1.38	0.234
Personel soignant, Infirmières	11	9	34	40	18%	24%	-6%	1.44	0.53	3.88	0.472
Belle-mère	8	1	37	48	2%	18%	-16%	10.38	1.24	86.69	0.010
Bon-père	5	#VALU E!	40	##### #		11%					
Autres mères allaitantes	2	4	43	45	8%	4%	4%	0.52	0.09	3.01	0.461
Les bien faiteurs [e.g., NGOs]	0	3	45	46	6%	0%	6%	0.00			0.092
Personne	2	12	43	37	24%	4%	20%	0.14	0.03	0.68	0.006
Beau-frère	0	1	45	48	2%	0%	2%	0.00			0.335
Grand-mère	1	1	44	48	2%	2%	0%	1.09	0.07	17.97	0.951
Tante	0	2	45	47	4%	0%	4%	0.00			0.171
15. Qui pourrait désapprouver:											
a. Mari	1	7	44	42	14%	2%	12%	0.14	0.02	1.16	0.036
b. Mère	1	6	44	43	12%	2%	10%	0.16	0.02	1.41	0.064
c. Cousines	2	4	43	45	8%	4%	4%	0.52	0.09	3.01	0.461

Déterminants	Faiseurs : +Exp. (A)	Non Faiseurs: +Exp. (B)	Non-Doers: - Exp. (C)	Doers: - Exp. (D)	Non Doers %	Doers %	Diff.	OR	Interval de Config.		valeur-p
d. Voisins	7	14	38	35	29%	16%	13%	0.46	0.17	1.27	0.130
e. Amis	6	10	39	39	20%	13%	7%	0.60	0.20	1.81	0.362
f. Autres	36	32	9	17	65%	80%	-15%	2.13	0.83	5.43	0.112
Personne	11	11	34	38	22%	24%	-2%	1.12	0.43	2.91	0.819
Les vieilles personnes	2	0	43	49	0%	4%	-4%				0.136
Mes ennemis	1	0	44	49	0%	2%	-2%				0.294
Les conseillers / autres femmes	1	1	44	48	2%	2%	0%	1.09	0.07	17.97	0.951
Les non-faiseurs	1	1	44	48	2%	2%	0%	1.09	0.07	17.97	0.951
Les non informés	0	1	45	48	2%	0%	2%	0.00			0.335
Belle mère	0	1	45	48	2%	0%	2%	0.00			0.335
Belle soeurs	0	1	45	48	2%	0%	2%	0.00			0.335
Infirmières	0	1	45	48	2%	0%	2%	0.00			0.335
Avantages:											
Bonne santé pour l'enfant	32	26	13	23	53%	71%	-18%	2.18	0.93	5.12	0.072
Pas/peu de maladies liées à la malnutrition, Protection contre la maladie	20	22	25	27	45%	44%	0%	0.98	0.44	2.22	0.965
Grandir bien (l'enfant), bonne croissance	14	13	31	36	27%	31%	-5%	1.25	0.51	3.06	0.624
Pas d'avantages	3	13	42	36	27%	7%	20%	0.20	0.05	0.75	0.010
Gagner le poids	3	5	42	44	10%	7%	4%	0.63	0.14	2.80	0.539
Augmentation de l'affection (entre l'enfant et la mère)	0	3	45	46	6%	0%	6%	0.00			0.092
20. Inconvénients											
Il n'y en a pas (pas d'inconvénients)	31	23	14	26	47%	69%	-22%	2.50	1.08	5.82	0.032
L'enfant devient malade, mauvaise santé de l'enfant	7	17	38	32	35%	16%	19%	0.35	0.13	0.94	0.034
Mausvaise croissance / perte poids	2	2	43	47	4%	4%	0%	1.09	0.15	8.10	0.931
L'enfant garde la faim	1	7	44	42	14%	2%	12%	0.14	0.02	1.16	0.036
Déshydratation / soif	0	2	45	47	4%	0%	4%	0.00			0.171

Déterminants	Faiseurs : +Exp. (A)	Non Faiseurs: +Exp. (B)	Non-Doers: - Exp. (C)	Doers: - Exp. (D)	Non Doers %	Doers %	Diff.	OR	Interval de Config.		valeur- de p
Ne sais pas	1	3	44	46	6%	2%	4%	0.35	0.03	3.48	0.349
Diminution du lait maternel	0	2	45	47	4%	0%	4%	0.00			0.171
Autres Déterminants											
Gravité Perçue											
6. Ce qu'elle pense de la gravité de la malnutrition											
Très grave	42	46	3	3	94%	93%	1%	0.91	0.17	4.77	0.914
Plus ou moins grave	1	1	44	48	2%	2%	0%	1.09	0.07	17.97	0.951
Un petit peu grave	0	2	45	47	4%	0%	4%	0.00			0.171
Pas du tout grave	0	0	45	49	0%	0%	0%				
(Très /plus ou moins grave [calc.])	43	47	2	2	96%	96%	0%	0.91	0.12	6.78	0.931
Manquant	2	0	43	49	0%	4%	-4%				0.136
7. Est-ce que les enfants peuvent mourir de la malnutrition?											
Oui	43	45	2	4	92%	96%	-4%	1.91	0.33	10.98	0.461
Possible	2	4	43	45	8%	4%	4%	0.52	0.09	3.01	0.461
Non	0	0	45	49	0%	0%	0%				
Je ne sais pas	0	0	45	49	0%	0%	0%				
Susceptibilité Perçue											
<i>(Not included -- worded as Action Efficacy)</i>											
Auto-efficacite Percue											
Pense qu'il/elle pourrait faire l'action préventive avec la connaissances/compétences actuelles											
Oui	39	22	6	27	45%	87%	-42%	7.98	2.86	22.29	0.000
Possible	1	7	44	42	14%	2%	12%	0.14	0.02	1.16	0.036
Non	5	19	40	30	39%	11%	28%	0.20	0.07	0.59	0.002
Ne sais pas	0	1	45	48	2%	0%	2%	0.00			0.335
(Oui/possible [calc.])	40	29	5	20	59%	89%	-30%	5.52	1.85	16.42	0.001
Non complété	0	0	45	49	0%	0%	0%				
Efficacité Perçue de l'Action											

Déterminants	Faiseurs : +Exp. (A)	Non Faiseurs: +Exp. (B)	Non-Doers: - Exp. (C)	Doers: - Exp. (D)	Non Doers %	Doers %	Diff.	OR	Interval de Config.		valeur-p
12. Pense qu'allaiter exclusivement peut aider son enfant à éviter la malnutrition											
Oui	39	32	6	17	65%	87%	-21%	3.45	1.22	9.78	0.016
Peut-être	1	4	44	45	8%	2%	6%	0.26	0.03	2.38	0.200
Non	3	11	42	38	22%	7%	16%	0.25	0.06	0.95	0.032
Ne sais pas	2	2	43	47	4%	4%	0%	1.09	0.15	8.10	0.931
(Oui/Peut-être [calculé])	40	36	5	13	73%	89%	-15%	2.89	0.94	8.90	0.058
Non complété	0	0	45	49	0%	0%	0%				
8. Un enfant non exclusivement allaité peut devenir malnutri											
Oui	39	22	6	27	45%	87%	-42%	7.98	2.86	22.29	0.000
Possible	3	9	42	40	18%	7%	12%	0.32	0.08	1.26	0.089
Non	1	16	44	33	33%	2%	30%	0.05	0.01	0.37	0.000
Ne sais pas	2	1	43	48	2%	4%	-2%	2.23	0.20	25.50	0.508
(Oui / Possible [calc.])	42	31	3	18	63%	93%	-30%	8.13	2.20	30.05	0.000
Non complété	0	1	45	48	2%	0%	2%	0.00			0.335
9. Pense que son enfant pourrait devenir malnourri s'il/elle n'était pas allaité exclusivement											
Oui	34	25	11	24	51%	76%	-25%	2.97	1.23	7.16	0.014
Peut- être	4	4	41	45	8%	9%	-1%	1.10	0.26	4.67	0.900
Non	5	16	40	33	33%	11%	22%	0.26	0.09	0.78	0.012
Ne sais pas	2	4	43	45	8%	4%	4%	0.52	0.09	3.01	0.461
(Oui/Peut-être [calc.])	38	29	7	20	59%	84%	-25%	3.74	1.40	10.05	0.007
Non complété	0	0	45	49	0%	0%	0%				
Acceptabilité Sociale Perçue											

Déterminants	Faiseurs : +Exp. (A)	Non Faiseurs: +Exp. (B)	Non- Doers: - Exp. (C)	Doers: - Exp. (D)	Non Doers %	Doers %	Diff.	OR	Interval de Config.		valeur- p
10. Pense que la plupart des personnes qu'elle connaît soutiennent sa décision de faire l'action préventive											
Oui	35	26	10	23	53%	78%	-25%	3.10	1.26	7.61	0.012
Possible	1	6	44	43	12%	2%	10%	0.16	0.02	1.41	0.064
Non	9	13	36	36	27%	20%	7%	0.69	0.26	1.82	0.455
Ne sais pas	0	4	45	45	8%	0%	8%	0.00			0.050
(Oui / Possible [calculé])	36	32	9	17	65%	80%	-15%	2.13	0.83	5.43	0.112
Non complété	0	0	45	49	0%	0%	0%				
Signaux Initiateurs d'Action											
11. Pense qu'elle peut se souvenir de l'action préventive la plupart du temps											
Très difficile	8	19	37	30	39%	18%	21%	0.34	0.13	0.89	0.025
Plus ou moins difficile	1	6	44	43	12%	2%	10%	0.16	0.02	1.41	0.064
Un petit peu difficile	0	5	45	44	10%	0%	10%	0.00			0.028
12. Pas du tout difficile	36	19	9	30	39%	80%	-41%	6.32	2.49	16.00	0.000
(Très / plus ou moins diff. [calc.])	9	25	36	24	51%	20%	31%	0.24	0.10	0.60	0.002
Non complété	0	0	45	49	0%	0%	0%				
Perception de la volonté Divine											
13. Pense que Dieu approuve l'allaitement exclusif											
Oui	37	30	8	19	61%	82%	-21%	2.93	1.13	7.62	0.025
Possible	3	3	42	46	6%	7%	-1%	1.10	0.21	5.73	0.914
Non	1	14	44	35	29%	2%	26%	0.06	0.01	0.45	0.000
Ne sais pas	4	2	41	47	4%	9%	-5%	2.29	0.40	13.17	0.341

Déterminants	Faiseurs : +Exp. (A)	Non Faiseurs: +Exp. (B)	Non-Doers: - Exp. (C)	Doers: - Exp. (D)	Non Doers %	Doers %	Diff.	OR	Interval de Config.		valeur-p
(Oui / Possible [calculé])	40	33	5	16	67%	89%	-22%	3.88	1.28	11.71	0.012
Non complété	0	0	45	49	0%	0%	0%				
14. Pense que Dieu approuve/pourrait approuver l'allaitement exclusif											
Oui	38	30	7	19	61%	84%	-23%	3.44	1.28	9.25	0.012
Possible	3	3	42	46	6%	7%	-1%	1.10	0.21	5.73	0.914
Non	1	14	44	35	29%	2%	26%	0.06	0.01	0.45	0.000
Ne sais pas	3	2	42	47	4%	7%	-3%	1.68	0.27	10.54	0.577
(Oui / Possible [calculé])	41	33	4	16	67%	91%	-24%	4.97	1.52	16.30	0.005
Non complété	0	0	45	49	0%	0%	0%				
Importance											
15. Que penses-tu de l'importance de l'action préventive?											
Très important	35	29	10	20	59%	78%	-19%	2.41	0.98	5.96	0.053
Important	1	10	44	39	20%	2%	18%	0.09	0.01	0.72	0.006
Moins important	4	1	41	48	2%	9%	-7%	4.68	0.50	43.58	0.139
Pas importants du tout	4	9	41	40	18%	9%	9%	0.43	0.12	1.52	0.184
Ne sais pas	1	0	44	49	0%	2%	-2%				0.294
(Tres Imp/Important [calculé])	36	39	9	10	80%	80%	0%	1.03	0.37	2.81	0.961
Non complété	0	0	45	49	0%	0%	0%				

APPENDIX B – BARRIER ANALYSIS WORKSHOP OBJECTIVES

LES OBJECTIFS DE L'ATELIER

D'ici la fin de l'atelier les participants auront :

1. Compris la théorie du Changement de Comportement et ce qui motive les gens pour changer.
2. Été capables d'expliquer quels comportements ont été choisis pour l'étude et pourquoi. (Résultats de l'étude des DLM, essentiels pour atteindre les objectifs du programme, et le besoin d'analyser et de créer une stratégie efficace pour le changement de comportement.)
3. Analysé les 4 différents composants de la Structure du Changement de Comportement
4. Praticqué le remplissage de chaque composant
5. Été capables d'exécuter la plupart des parties de l'étude d'Analyse des barrières (formation de personnel, collecte des données, saisie des données, analyse des données, et l'utilisation de tes résultats pour modifier ou influencer tes stratégies du programme. (Nous ne discuterons pas en détail la préparation du questionnaire.)
6. Analysé des données d'une Analyse des Barrières ou une Enquête des Faiseurs/Non-faiseurs afin d'identifier les facteurs clés ayant un effet sur le groupe prioritaire ou d'influence
7. Développé une stratégie de Changement de Comportement utilisant « la structure » basée sur les résultats d'une recherche qualitative
8. Donnés et reçu de la retro-information sur la qualité de leurs « structures » afin de les améliorer
9. Été capables d'utiliser un suivi et une évaluation réguliers des déterminants essentiels pour s'assurer que les interventions du programme sont entrain d'avoir l'impact désiré et d'améliorer les vies des bénéficiaires.

APPENDIX C – DESIGNING FOR BEHAVIOR CHANGE FRAMEWORK

Behavior	Priority Group	Determinants	Key Factors	Activities
<p><u>To promote this behavior:</u></p> <p><i>Exclusively breastfeed children to six months of age</i></p>	<p><u>among this audience:</u></p> <p>Les mères d'enfants de 0 à 11 mois</p> <p>Description : Mères 16-50 ans en milieu rural. Majorité analphabète. Travaillent dans leurs communautés.</p> <p>Comportements et pratiques partagés :</p> <p><input type="checkbox"/> Elles allaitent exclusivement jusqu'à 4 mois, puis elles donnent de la bouillie, de mais, purées d'aliments....</p> <p>Désires partagés :</p> <p><input type="checkbox"/> Désirent avoir un enfant gros, en bonne santé</p> <p>Barrières partagés :</p> <p><input type="checkbox"/> Après 3 mois, elles pensent qu'elles n'ont pas du lait maternel suffisant</p> <p>Stage de changement : Contemplation</p>	<p><u>we researched the following determinants:</u> (Determinants found to be important are checked)</p> <p><input type="checkbox"/> Perceived Susceptibility</p> <p><input type="checkbox"/> Perceived Severity</p> <p><input checked="" type="checkbox"/> Perc. Action Efficacy [1; NonDoers are 21X less likely to say that a child who does not EBF will become malnourished.]</p> <p><input checked="" type="checkbox"/> Perceived Social Acceptability [3; Doers are 10.4X, 6.5X, 5.9X, and 3.8X more likely to say mother-in-laws, husbands, cousins, and mothers approve]</p> <p><input checked="" type="checkbox"/> Perc. Self-efficacy [Doers are 8X more likely to say that they can EBF, but few difficulties mentioned. Change through improving soc. accept.]</p> <p><input checked="" type="checkbox"/> Cues for Action [Doers are 6.3X more likely to say that it's not at all difficult to remember.]</p> <p><input checked="" type="checkbox"/> Perceived Divine Will [2; NonDoers are 17.6X more likely to say that God does not approve of EBF.]</p> <p><input checked="" type="checkbox"/> Perceived Positive/Negative Attributes of the Action [5; NonDoers were 7.3X more likely to believe that a child who is EBF will always be hungry.)]</p> <p><input checked="" type="checkbox"/> Perceived Importance of the Action</p>	<p><u>and will address these key factors (priority benefits and priority barriers, in order of importance):</u></p> <ol style="list-style-type: none"> 1. Increase the % of mothers who believe that a child who is not EBF can become malnourished. 2. Increase the % of mothers who believe that God approves of EBF. 3. Increase the % of mothers (of children 0-23m) who believe that their mother-in-law, husband, cousins, and mother approve of EBF. 4. Increase the % of mothers who believe that a child will not be hungry or lacking in nutrition if they are EBF. 	<p><u>by implementing these activities:</u></p> <ol style="list-style-type: none"> 1. Invite mothers who have EBF and believe in EBF with children with good health/weight to give testimonies on EBF at meetings in the community/health facilities (following PNC and GM/P sessions). In HF meetings use growth charts to show the difference between several children growing well who are exclusively breastfeeding and contrast them to other children who are losing weight who are not EBF. 2. Give pastors/priests sermon guides on EBF. 3. Develop radio spots that feature mother-in-laws, husbands and cousins encouraging mothers to EBF. Have LMs include the mother-in-law, husbands, and the grandmother when teaching mothers of young children about EBF. Mention to husbands that EBF can save their family money. 4. Explain to mothers (via LMs and HF visits) that children cry for many reasons, and crying does <u>not</u> always mean the child is hungry. Use growth charts to show mothers that children who cry a lot (identify cases ahead of time) are still growing well and therefore are not lacking adequate nutrition.

APPENDIX D – EBF QUESTIONNAIRE

Questionnaire d'analyse des barrières sur L'Allaitement Maternel Exclusif Mères d'enfants de 0-11m, CRS/FH/IMC

Nom de l'interviewer: _____ Questionnaire No.: _____

Date: ____/____/____ Colline: _____

GROUPE: Faiseur NonFaiseur

Age de la mère bio Interviewée: ____ années Age de son plus jeune enfant : ____ mois

Le prénom du plus jeune enfant âgé de 6-11 mois : _____

SE REFERER TOUJOURS A CET ENFANT PENDANT L'INTERVIEW

Discuter de la CONFIDENTIALITE:

Vous êtes invité à participer à une étude de recherche sous la direction de <NOM> de la Food for the Hungry. Votre participation à cette recherche est entièrement volontaire. On ne refusera pas de vous rendre service, et vous ne serez pas discriminé en aucune façon, si vous décidez de ne pas participer.

Le but de cette étude est de comprendre pourquoi les mères font ou ne font pas certains comportements liés à la nutrition. Si vous choisissez de prendre part à cette étude, vous serez interrogé par un promoteur de la santé pendant environ 20 minutes. Vous ne courez aucun risque en participant à cette étude. Néanmoins, vous pouvez refuser de répondre à des questions ou d'arrêter votre participation à cette étude si vous n'êtes pas confortable.

Food for the Hungry espère utiliser cette recherche pour aider à lutter contre la malnutrition chez les enfants au Burundi, mais nous ne pouvons pas promettre que vous ou vos enfants bénéficieront directement de votre participation à l'étude.

Tout ce que vous direz sera tenue strictement confidentielle et ne sera pas partagée avec quiconque. Nous n'allons pas garder votre nom ou vos coordonnées à aucune des données que nous recueillons. Si les résultats de cette étude sont présentés dans des revues ou des réunions, les gens qui ont participé à cette étude ne sera pas identifié.

Demander à la personne si elle souhaite participer. Sinon, la remercier de son temps.

1. Quel est votre relation parentale avec cet enfant (Si mère, sonder si biologique ou adoptive?)
Mbega upfana iki n'uyu mwana (Asangwa ari nyina, mubaze utubazo kugira ngo umenye ko ari nyina amuvyara canke yoba ari umurerano)
 1. Mère Biologique **Continuer** (Nyina amuvyara **Shishikara**)
 2. Mère Adoptive → **Terminer questionnaire** (Nyina umureze **Ca ugarukiriza ngaho ibibazo**)
 3. Grand-mère → **Terminer questionnaire** (Nakuru **Ca ugarukiriza ngaho ibibazo**)
 4. Tante → **Terminer questionnaire** (Nasenge **Ca ugarukiriza ngaho ibibazo**)
 5. Autres (Spécifier: _____) → **Terminer questionnaire** (Ibindi [Tomora] : _____ **Ca ugarukiriza ngaho ibibazo**)

(Questions filtre des répondantes dont le plus jeune enfant est de 0-5 mois)

2. Are you currently breastfeeding (NAME)?
 a. Yes → **Continue with Question #3**
 b. No → **Mark as NonDoer → Continue at Question #6**
 c. Don't know/No Response → **END INTERVIEW**

3. Are you currently giving (NAME) anything other than breast milk, including water, other liquids or other foods?
- a. Yes → **Mark as NonDoer → Continue at Question #6**
- b. No → **Mark as Doer → Continue at Question #6**
- c. Don't Know / No response → **END INTERVIEW**

(Screening Questions for Respondents whose youngest child is between 6-11 months of age)

4. Quel âge avait (NOM) quand vous lui avez donné des choses à boire autres que le lait maternel pour la première fois?
Mbega [IZINA] yari afise amezi angahe aho watangura kumuha ubwa mbere ibindi bintu vyo kunywa bitari amata y'ibere ?
_____ mois
5. Quel âge avait (NOM) quand vous lui avez donné des choses à manger autre que le lait maternel pour la première fois?
Mbega [IZINA] yari afise amezi angahe aho wantangura kumuha ubwa mbere ibindi bintu vyo gufungura bitari amata y'ibere?
_____ mois

- Si la réponse aux questions #2 et #3 sont TOUTES 6 mois ou plus, alors marquer le répondant comme une FAISEUR au début de la 1ère page.
- Si la réponse soit à la question #2 soit à la question #3 est moins de 6 mois, alors marquer le répondant comme une NONFAISEUR au début de la 1ère page.

EXPLIQUER: Nous conduisons cette étude pour mieux comprendre pourquoi des mères font l'AME et d'autres pas. AME veut dire donner UNIQUEMENT du lait maternel, pas d'autres types de nourriture ou de liquide, incluant de l'eau, jusqu'à ce que l'enfant atteigne l'âge de six mois.
SIGURA : Iki cigwa turiko turagikora kugira ngo dutahure neza igituma abavyeyi bamwe bamwe batahura akamaro ko kwonsa ata kindi kiguherekeje, abandi nabo ntibabitahure. Kwonsa ATA KINDI KIGUHEREKEJE ni ukuvuga ko umwana ahabwa amata y'ibere rya nyina gusa, ntagaburirwe ubundi bwoko bw'ibifingurwa canke bw'ibinyobwa, harimwo n'amazi, gushika igihe umwana azoba amaze kugira amezi atandatu.

(Sévérité Perçue)

6. Selon vous, la malnutrition est-elle un problème de santé: Très grave, Plus ou moins grave, Un petit peu grave, ou Pas du tout grave?
Ku bwawe, mbega ingwara zivuye ku gufungura ni ingorane y'amagara: Ihambaye cane, Ihambaye atari cane canke buke, Ihambaye buke, Idahambaye na gato ?
- a. Très grave (Ihambaye cane)
- b. Plus ou moins grave (Ihambaye atari cane canke buke)
- c. Un petit peu grave (Ihambaye buke)
- d. Pas du tout grave (Idahambaye na gato)
7. Selon vous, un enfant peut-il mourir de la malnutrition?
Mbega ku bwawe, vyoshika ko umwana yohitanwa n'ingwara zivuye ku gufungura nabi ?
- a. Oui (Ego)
- c. Non (Oya)
- d. Je ne sais pas/Pas de Réponse (Sinzi/Nta nyishu)

(Susceptibilité Perçue)

8. Si un enfant âgé de moins de 6 mois n'est pas exclusivement allaité(e) aux seins, pensez-vous qu'il/elle peut devenir malnutri?
Hamwe umwana afise amezi ari musi y'atandatu atokwonswa ibere ryonyene gusa, mbega wiyumvira ko ivyo vyoshobora gutuma afatwa n'ingwara zivuye ku gufungura nabi ?
- a. Oui (Ego)
 b. Possible (Birashoboka)
 c. Non (Oya)
 d. Je ne sais pas (Sinzi)
9. Si (NOM) n'était pas exclusivement allaité aux seins, pensez-vous qu'il/elle aurait pu devenir malnutri?
Iyo [IZINA] ataza guhabwa ibere ryonyene gusa, mbega wiyumvira ko yari guhava afatwa n'ingwara zivuye ku gufungura nabi?
- a. Oui (Ego)
 b. Possible (Birashoboka)
 c. Non (Oya)
 d. Je ne sais pas (Sinzi)

(Auto-efficacité Perçue)

10. Avec vos connaissances et capacités actuelles, Pensez-vous que vous seriez en mesure d'allaiter exclusivement votre prochain enfant jusqu'à ce qu'il/elle ait 6 mois?
Wishimikije ubumenyi hamwe n'ububasha ufise gushika ubu, Mbega wiyumvira ko woba uzoshobora kwonsa ikindi kibondo uzoronka kw'ibere ryonyene gusa gushika gikwize amezi atandatu ?
- a. Oui (Ego)
 b. Possible (Birashoboka)
 c. Non (Oya)
 d. Je ne sais pas (Sinzi)
11. Qu'est-ce qui pourrait vous rendre (ou aurait pu vous rendre) facile la tâche d'allaiter (NOM) exclusivement aux seins?
Ni iki coshobora gutuma (canke cari gutuma) igikorwa co kwonsa [IZINA] kw'ibere ryonyene gusa kikworohera?
12. Qu'est-ce qui pourrait vous rendre (ou aurait pu vous rendre) difficile la tâche d'allaiter (NOM) exclusivement aux seins?
Ni iki coshobora gutuma (canke cari gutuma) igikorwa co kwonsa [IZINA] kw'ibere ryonyene gusa kikugora?

(Efficacité Perçue de l'Action)

13. Pensez-vous qu'allaiter exclusivement aux seins (NOM) avant l'âge de 6 mois pourrait aider (NOM) à éviter de devenir malnutri?
Mbega wiyumvira ko kwonsa [IZINA] kw'ibere ryonyene gusa mu kiringo cose c'imbere y'amezi 6 bishobora kumufasha kudafatwa n'ingwara zivuye ku gufungura nabi ?
- a. Oui (Ego)
 b. Possible (Birashoboka)
 c. Non (Oya)
 d. Je ne sais pas (Sinzi)

(Acceptabilité Sociale / Normes Sociales Perçues)

14. Selon vous, la plupart des gens que vous connaissez approuveraient-ils (**auraient-ils approuvé**) le fait que vous allaitez exclusivement aux seins (NOM)?

Mbega ku bwawe, benshi mu bantu uzi bogushigikira (**canke bari kugushigikira**) mu ngingo yo kwonsa [IZINA] kw'ibere ryonyene gusa ?

- a. Oui (Ego)
- b. Possible (Birashoboka)
- c. Non (Oya)
- d. Je ne sais pas (Sinzi)

15. Qui sont les gens qui pourraient **approuver** (ou **auraient approuvé**) le fait que vous allaitez exclusivement aux seins (NOM)?
Ni abahe bantu boshigikira (**canke bari gushigikira**) ko wonsa [IZINA] kw'ibere ryonyene gusa ?

- 1- a. Mari(Umugabo) 2- b. Mère(Mawe) 3- c. Cousines(Abavyara) 4- d. Voisines(Ababanyi)
- 5- e. Amis(abagenzi) 6- f. Autres Spécifier _____ (Abandi.Tomora abo ari bo _____)

16. Qui sont les gens qui pourraient **désapprouver** (ou **auraient désapprouvé**) le fait que vous allaitez exclusivement aux seins (NOM)?
Ni abahe bantu batoshigikira (**canke batari gushigikira**) ko wonsa [IZINA] kw'ibere ryonyene gusa?

- a. Mari(Umugabo) b. Mère(Mawe) c. Cousines(Abavyara) d. Voisines(Ababanyi)
- e. Amis(abagenzi) f. Autres, Spécifier _____ (Abandi.Tomora abo ari bo _____)

(Signaux initiateurs d'action)

17. Si tu aurais voulu allaiter exclusivement aux seins (NOM) jusqu'à ce qu'il/elle atteigne/ait atteint l'âge de six mois, serait-il difficile pour toi de te rappeler de **ne pas** donner à (NOM) des choses autres que du lait maternel, incluant de l'eau, pendant la journée? Très difficile, Plus ou moins difficile, un petit peu difficile, ou Pas du tout difficile?

Hamwe woba ugomba kwonsa [IZINA] kw'ibere ryonyene gusa gushika ashikiriye amezi atandatu, mbega vyokugora kuza uribuka mu gihe c'umusi kudaha [[IZINA] ibindi bintu bitari amata y'ibere, harimwo n'amazi?

- a. Très difficile (Biragoye cane)
- b. Plus ou moins difficile (Biragoye atari cane atari na buke)
- c. Un petit peu difficile (Biragoye buke)
- d. Pas du tout difficile (Ntibigoye na gato)

(Perception de la Volonté Divine)

18. Pensez-vous que **Dieu approuve** le fait que les mères allaitent exclusivement aux seins leurs enfants jusqu'à ce qu'ils aient six mois?

Mbega wiyumvira ko Imana ishigikiye ko abavyeyi bokwonsa abana babo kw'ibere ryonyene gusa gushika bageze ku mezi atandatu ?

- a. Oui (Ego)
- b. Possible (Birashoboka)
- c. Non (Oya)
- d. Je ne sais pas (Sinzi)

19. Pensez-vous que **Dieu approuve** (ou **approuverait**) le fait que vous allaitez exclusivement (NOM) aux seins jusqu'à ce qu'il/elle atteigne /ait atteint l'âge six mois?

Mbega wiyumvira ko Imana ishigikiye (**canke yoshigikira**) ko wonsa [IZINA] kw'ibere ryonyene gusa gushika ashikiriye/aho azoba ashikiriye amezi atandatu ?

- a. Oui (Ego)
- b. Possible (Birashoboka)
- c. Non (Oya)
- d. Je ne sais pas (Sinzi)

(Attributs Positifs et Négatifs de l'Action)

20. Quels sont les avantages (ou seraient les avantages) du fait d'allaiter exclusivement votre enfant jusqu'à ce qu'il/elle atteigne /ait atteint l'âge de six mois? (Ecrire toutes réponses ci-dessous)
Ni utuhe turusho (canke twoba uturusho) two kwonsa kw'ibere ryonyene gusa umwana wawe gushika ashikiriye/aho azoba ashikiriye amezi atandatu. (Ni wandike inyishu zose ngaho musu)
21. Quels sont les inconvénients (ou serait les inconvénients) du fait d'allaiter exclusivement votre enfant jusqu'à ce qu'il/elle atteigne /ait atteint l'âge de six mois? (Ecrire toutes réponses ci-dessous)
Ni izihe nkurikizi mbi (canke zoba ari inkurikizi mbi) zo kwonsa umwana kw'ibere ryonyene gusa gushika ashikiriye/aho azoba amaze gushikira amezi atandatu ? (Andika inyishu zose ngaho musu)
22. Selon vous, est-il important d'allaiter exclusivement aux seins les enfants pendant les 5 premières mois de la vie? Très important, Plus ou moins important, Un petit peu important ou Pas important du tout?
Ku bwawe, mbega birahambaye kwonsa abana kw'ibere ryonyene gusa mu mezi atanu yabo ya mbere yo kubaho ? Birahambaye cane, Birahambaye atari cane kandi atari buke, Birahambaye buke, canke Ntibihambaye na gato ?
- a. Très important (Bilahambaye cane)
 - b. Important (Bilahambaye atari cane kandi atari buke)
 - c. Moins important (Bilahambaye buke)
 - d. Pas important du tout (Ntibihambaye na gato)
 - e. Je ne connais pas l'importance (Sinzi agaciro kavyo)

**REMERCIER LA REPONDANTE POUR SON TEMPS
SHIMIRA UWO YARIKO ARISHURA IBIBAZO KU MWANYA WIWE YATANZE**

APPENDIX E – IRB APPROVAL

**THE GEORGE WASHINGTON UNIVERSITY & MEDICAL CENTER
OFFICE OF HUMAN RESEARCH
INSTITUTIONAL REVIEW BOARD**

EXEMPT FROM IRB REVIEW REQUEST FORM

Before completing this form, complete the Human Subject Research Determination worksheet to ensure that you are in fact required to submit your new study to the Office of Human Research. The OHR will only review studies deemed "human subject research."

INVESTIGATOR AND TEAM CONTACT INFORMATION			
IRB# (ADMIN USE ONLY - WILL BE ASSIGNED UPON SUBMISSION)	110713	VERSION DATE:	
TYPE OF HIPAA AUTHORIZATION REQUESTED:	- choose one -		
PROTOCOL TITLE AND SPONSOR:			
TITLE : Nutrition Barrier Analysis in Burundi			
SPONSOR : Food for the Hungry			
PRINCIPAL INVESTIGATOR INFORMATION (MUST BE GWU FACULTY)			
LAST NAME:	SHERRY	FIRST NAME:	JIM Degree: MD; PHD
DEPARTMENT	GLOBAL HEALTH	SCHOOL:	PUBLIC HEALTH
CAMPUS ADDRESS:	2175 K. ST, NW		
PHONE:	(202) 994-3799	EMAIL:	SHERRY@GWU.EDU
PRINCIPAL CONTACT IF OTHER THAN PI: (THIS MAY BE THE STUDENT/TRAINEE)			
LAST NAME:	FRANCISCO	FIRST NAME:	JOSEPHINE
CAMPUS ADDRESS:			
PHONE:	8587768261	EMAIL:	VALENCIA@GWMAIL.GWU.EDU

Recommendation:


Study Registered as Exempt. Category: 2

A HIPAA waiver of research subject authorization is justified for this study under 45 CFR 46 164.512 based on the following criteria:


1. The proposed uses and disclosures of protected health information (PHI) involve no more than minimal risk to the privacy of individuals.
2. The research could not practicably be conducted without the waiver.
3. The research could not practicably be conducted without access to and use of the PHI.

Please obtain permission from the privacy officer of the health care organization in which you will access protected health information before beginning your research.

This research does NOT meet the regulatory/institutional requirements for exemption from IRB review. To conduct this research you must complete an IRB submission package for IRB review. For more information on completing a research submission, contact OHR at 202-994-2715.



 Authorized Designee



 Signature

 11/20/09

 Date

This Exempt Registration does not expire nor does it require renewal.

Reporting Proposed Changes in Research

This exempt from IRB review determination only applies to this form/protocol, as currently proposed. Therefore, if there are any changes that increase the risk to subjects (e.g., methodology, data gathering instruments, type of information being accessed or disclosed, etc.) the changes must be submitted to the IRB/OHR for approval *PRIOR TO* implementation.

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