

CHAPTER 1

INTRODUCTION

Appropriate feeding practices play a crucial role in preventing mortality and in achieving optimal health outcomes for infants and young children. During the first 6 months of life, exclusive breastfeeding, followed by continued breastfeeding into the second year of life, prevents a large proportion of morbidity and mortality among infants and young children (World Health Organization, 2002).

Over the last several decades, great progress has been made in the promotion of breastfeeding and, more recently, in the duration of exclusive breastfeeding (World Health Organization, 2001a). Multiple factors have contributed to the success of efforts to reverse the decline of breastfeeding previously observed in most developing countries from the 1950s through the 1980s (UNACC/SCN, 2000). These include the extent to which maternity settings support successful initiation and establishment of breastfeeding, regulations governing the marketing practices of the infant food industry, and counseling at the individual level. Improved knowledge about the factors that facilitate and constrain breastfeeding, and the utilization of this knowledge in the design of programs, in identifying policy needs and in advocacy has been an important factor in enhancing rates of breastfeeding.

Current knowledge about the factors that constrain and facilitate breastfeeding has been obtained through various types of research, ranging from randomized controlled field trials to epidemiological and social science research. Ethnographic, sociological and psychological studies have been particularly helpful for developing an understanding of infant feeding behavior in communities throughout the world.

Previously, research on the social and epidemiological aspects of infant feeding focused mainly on the determinants of the decision to breastfeed or bottle feed and on the factors that influenced the total duration of breastfeeding, such as the role

of women's work (UNACC/SCN, 2000). Prior to the demonstration of the value of exclusive breastfeeding there was little attention to the social factors involved in exclusive breastfeeding, as distinguished from any breastfeeding. More recently, attention has been directed to understanding the determinants of exclusive breastfeeding and, as the knowledge base about the social dynamics of exclusive breastfeeding expands, a measure of exclusive breastfeeding is increasingly included in programs designed to improve early infant feeding.

One aspect of infant feeding that requires extensive understanding of behavior and household socio-cultural contexts is breastfeeding within the context of HIV. The discovery in 1985 that the virus could be transmitted through breastmilk created a major crisis for the promotion of breastfeeding—particularly in conditions where large proportions of the population are infected with the virus, and where breastfeeding is the cultural norm (UNAIDS, 1998). However, the finding that exclusive breastfeeding carries a lower risk of transmission compared to mixed feeding, gave new hope and new challenges for promoting exclusive breastfeeding (Coutsoudis, 1999) and has stimulated increasing attention to the social and cultural factors that affect HIV positive mothers' infant feeding decisions and behaviors.

Another "special circumstance" that warrants particular attention to the social context is infant feeding during the newborn period (the period from birth to the first 28 days of life). Cultural beliefs such as the ritual pollution of mothers during the early postpartum period, as well as elements of the prohibitive costs of delivering with the help of medically trained professionals for most mothers, are some of the examples that illustrate the need to investigate the social and cultural context of infant feeding during the newborn period.

Until fairly recently, the early postnatal period had not been recognized as an area that requires special attention (Knippenberg et al., 2005). Previously much of the

research on infancy has simply regarded the first days of life as part of infancy, rather than separating this critical period from other phases in the infant's first year of life. Consequently, there is a dearth of knowledge about the neonatal period that can be drawn on to design interventions. This generalization applies to many aspects of household neonatal care, including specific behaviors related to feeding during the neonatal period, and the cultural context within which these occur.

As Huffman (2001) has proposed, the timing of neonatal deaths has important implications for the potential impact of improvements in breastfeeding on neonatal mortality. She notes that mortality during the first week of life is primarily associated with poor infant health at birth (prematurity, low birth weight and congenital abnormalities) and to complications of delivery (cord infections and birth trauma or asphyxia), and that, for this reason, improving breastfeeding practices has relatively little impact on mortality in the first week of life. She proposes, however, that beyond one week of age, over half of deaths are due to infection and that, with the exception of tetanus, most of these deaths may be prevented by breastfeeding. Huffman's argument has drawn attention to the importance of investigations of infant feeding during the newborn period.

The objective of this dissertation is to describe infant feeding behaviors and their socio-cultural context with respect to: (a) HIV/AIDS and (b) newborn care. In the dissertation, I draw on a range of social science theories, and primarily on ethnographic techniques that were utilized in field work conducted in two sites in sub-Saharan Africa: Kwa-Zulu Natal in South Africa, and Pemba Island in Tanzania. In the descriptions, I pay particular attention to variations in beliefs and practices within and across the three study sites in which I conducted empirical research. The results of the three studies provide useful information for breastfeeding promotion activities, particularly those focusing on the first six months of infant life.

Dissertation outline

In chapter 2, following a review of current global definitions of infant feeding terms, I outline the crucial role that appropriate infant feeding practices play in achieving optimal health outcomes, particularly during the first six months of infant life. I also review common infant feeding patterns in sub-Saharan Africa. Finally, I present a conceptual framework linking infant feeding behavior to social and cultural factors at various levels, including the individual, inter-personal and the health care organization. The framework emphasizes the importance of the cultural *embeddedness* of infant feeding behavior.

In chapter 3, I discuss infant feeding in relation to HIV and neonatal health management. In reviewing HIV and breastfeeding, I discuss infant feeding methods recommended for HIV infected mothers—including the use of animal milks and infant formula—and the challenges that these pose for infant nutrition and health. In reviewing neonatal management, I focus on issues related to the initiation of early and exclusive breastfeeding—including the feeding of colostrum—and its importance for newborn health and survival.

In chapter 4, I describe the theoretical and methodological approaches that used to investigate infant feeding in the three field studies. In particular, I describe the ethnographic approach and its techniques of data collection—including free listing, pile sorting, participant observation and key informant interviewing. I discuss techniques of ethnographic data analysis, including a “grounded” approach to text analysis, and the use of Multi-Dimensional Scaling (MDS) for the analysis of pile sort data. Following this description I also discuss the weaknesses of relying exclusively on ethnography for the purposes of public health and nutrition, including the problem of “exotic selectivity.” I conclude by discussing the “Trial of Improved Practices,” (TIPS) an approach developed by Griffiths et al. (1997) and which is inspired by

ethnography and social marketing. TIPS are characterized by “dialogue” between the people whose health is at stake, and the researcher whose knowledge is often based on scientific analysis.

I present the results of the research in chapters 5 to 8. The first study, the subject of Chapter 5, is an investigation of infant feeding (breastfeeding and replacement feeding) within the context of HIV infection. It was conducted in Hlabisa district in KwaZulu Natal, an area of high HIV prevalence in rural South Africa. In the study, I draw on a small sample of HIV positive mothers who had previously received in-depth, personalized information about exclusive breastfeeding. After a description of the objectives, methods and results of the study, I discuss beliefs related to the transmission of HIV through breastmilk and socio-cultural constraints faced by HIV-positive women in South Africa in carrying out their chosen method of infant feeding.

The second and third studies reported in this dissertation were conducted in Pemba Island, Tanzania. Pemba has relatively low HIV prevalence, but it has high rates of newborn mortality. Both studies in Pemba investigate infant feeding within the context of newborn care. The initial study in Pemba utilized a small sample of mothers to whom we had not provided any prior instruction or advice about infant feeding. In chapters 6 and 7, I present the objectives, methods and results of the investigation of infant feeding in relation to routine care of the newborn in the community.

Chapter 6 presents the results from a thematic (text) analysis in which I discuss women’s beliefs about the vulnerability of the newborn, and the implication of these for newborn care. Chapter 7 reports the results of a formal ethnographic, cognitive mapping technique, analyzed with a multi-dimensional scaling approach. Here, I discuss the organization of women’s perceptions (the cognitive map) of newborn care

practices and how feeding “fits” within local understandings about the best strategies to enhance survival of the newborn.

The third study in the dissertation draws on a small sample of Pemban mothers for whom we provided in-depth, personalized information about exclusive breastfeeding using an approach inspired by the “Trial of Improved Practices.” In Chapter 8, I highlight the practices that women found most difficult to adopt following recommendations for behavior change and those that fitted well with local cultural understandings.

Chapter 9 provides a discussion incorporating the findings of all three studies. I discuss differences and commonalities across sites, highlighting the influence of socio-cultural factors on infant feeding behavior and the constraints and motivations for women to practice appropriate infant methods behaviors. Examining feeding practices from the perspective of the women who carry out these practices confirms some aspects and refutes other aspects of research conducted in sub-Saharan Africa. While recognizing the limitations of the three studies, I conclude the chapters with a discussion of the programmatic implications of the three field studies for improved infant feeding practices in sub-Saharan Africa.

CHAPTER 2

BREASTFEEDING AND CHILD HEALTH AND SURVIVAL: A SOCIAL PERSPECTIVE

1. Defining infant feeding terms

In the first year of life, breastfeeding is one of the most important strategies for improving child survival (Black et al., 2003; Jones et al., 2003; Bellagio Child Survival Study Group, 2003). As a global public health recommendation, with the exception of very few medical conditions, infants should be exclusively breastfed for the first six months of life (WHO WHO Global Strategy on infant feeding, 2002).

Within the large body of published research studies on breastfeeding, which has helped to shape breastfeeding knowledge, attitude, practice, and policy throughout the world, there are, inevitably, some conflicting findings. For the most part the ambiguities and apparent contradictions can be attributed either to inadequacies in study designs, and/or to varying definitional schemes for breastfeeding behaviors. Increasingly, researchers and policy makers realized that a single global term, “breastfeeding,” is inadequate to describe the numerous patterns of breastfeeding behaviors.

Apart from creating ambiguities, the imprecise categorization of feeding has led to an underestimate of the protective effect of breastfeeding on infant mortality (Labbok and Krasovec, 1990; Labbok, 1997). Consistent and valid definitions of breastfeeding were needed not only to ensure accurate conclusions by policy makers, but also to increase comparability of data collected from several countries or regions and to improve communication between programs (Coffin et al., 1997). In the present era of HIV/AIDS, the finding that the pattern of infant feeding may influence rates of HIV transmission through breastmilk from the mother to the child has provided

additional incentive for consistent and strict definitions of infant feeding patterns (Greiner, 2002).

In order to resolve definitional issues, the World Health Organization and its partner agencies, UNICEF and UNAIDS (1998) developed a definitional schema for use in research, education, and training on breastfeeding. These definitions, which will be used in this dissertation, are quoted in Table 2.1 below.

Table 2.1: WHO/UNICEF/UNAIDS definitions of infant feeding terms (Source: UNAIDS/UNICEF/WHO, 1998).

Pattern of feeding	Description of pattern
(Any) Breastfeeding	“An infant who receives breast milk, either directly from the breast or expressed, is considered to be breastfed. Breastfeeding practices are further described according to timing and frequency. In terms of timing, breastfeeding is described as on-demand (by the infant) or on schedule (determined by a schedule or work/separation demands of the mother).”
Breast milk substitute	“A breast milk substitute is defined as any food marketed or otherwise presented as partial or total replacement from breastmilk, whether or it is not suitable for that purpose.”
Exclusive breastfeeding	“With the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines, an infant who receives only breast milk from his/her mother or a wet nurse; or expressed breast milk from his mother, a breast milk donor or from a milk bank and no other liquids, or solids, is considered exclusively breastfed.”
Predominant breastfeeding	“When an infant’s predominant source of nourishment is breast milk, but the infant receives water or water-based drinks (e.g. sweetened or flavored water, teas and infusions); fruit juice; Oral Rehydration Salts (ORS); drop and syrup forms of vitamins, minerals, and medicines; and folk fluids (in limited quantities), the infant is considered to be predominantly breastfed. With the exception of fruit juice and sugar-water, no food-based fluids are allowed under this definition. Folk fluids are defined as liquids used for non-nutritional purposes such as oil to relieve constipation or tea to relieve colic.”
(Mixed) Partial breastfeeding	“When an infant is given some breastfeeds, and some artificial feeds, either milk or cereal, or other food, the infant is defined as mixed fed.”
Replacement feeding	“If an infant does not receive any breast milk, but receives a diet that provides all of the infant’s nutrition (whether or not this is nutritionally adequate), the infant is considered replacement fed.”

2. Importance of appropriate infant feeding practices

For a long time, the risks of replacement feeding for child health and survival have been well documented (see for example Jelliffe and Jelliffe, 1978; Popkin and Latham, 1973). Compared to replacement feeding, exclusive breastfeeding protects infants from infection, in part by limiting orally introduced pathogens, and in part because the anti-infective properties of breastmilk inhibit bacterial and viral growth. To paraphrase the American Dietetic Association (James and Dobson, 2005), because exclusive breastfeeding delays menstruation through its inhibitory effect on ovulation, it serves as a “natural form of birth control.” Pregnancies that are too closely spaced are deleterious for both the mother and the infant’s health (Perez et al., 1993).

Based on a review of current knowledge about breastmilk, James and Dobson (2005) note that breastmilk is specifically tailored to meet the nutritional needs of the infant, because it has the appropriate balance of nutrients, and because these are provided in a form that is easily digestible and bioavailable for the infant, making breastmilk superior to all other milk substitutes. The authors explain that the protein in breastmilk’s is mostly α -lactalbumin, a whey protein that forms a soft, easily digestible curd. Because there are only small quantities of this protein, the amount of nitrogen presented to the infant’s immature kidney matches what the infant can handle. They also explain that breast milk has low quantities of sodium, allowing the fluid requirements of the exclusively breastfed infant to be met, while keeping the renal solute load low. Further, the minerals in breast milk are mostly bound to proteins, making them highly bio-available to the infant. Some of the minerals are also balanced according to a ratio that is ideal for their absorption. For example, the ratio of calcium-to-phosphorus (2:1) is ideal for the absorption of calcium, phosphorus, and magnesium. In addition to minerals and proteins, breastmilk also

provides generous amounts of carbohydrates, essential fatty acids, saturated fatty acids, medium-chain triglycerides, long-chain polyunsaturated fatty acids, and cholesterol.

Artificial feeding increases the risk for a large number of acute and chronic diseases. These diseases include: diarrhea and gastrointestinal illnesses; lower respiratory infection; otitis media; bacterial meningitis; necrotizing enterocolitis; malocclusions or misalignment of teeth; allergic diseases; childhood asthma; childhood leukemia; childhood obesity; and Sudden Infant Death Syndrome (James and Dobson, 2005). Artificial feeding has also been linked with the risk of lower cognitive development—this risk may increase with the duration of artificial feeding and may extend through the school-age years (James and Dobson, 2005).

a. Importance of appropriate infant feeding practices for infant health and survival

The benefits of breastfeeding may depend on the type of breastfeeding (i.e. exclusive, predominant or mixed) and also on the age of the child. As summarized by Kuate Defo (1997), within the first 4 to 8 months of life, the benefits of breastfeeding are more pronounced in exclusively breastfed infants compared to infants who are mixed fed. Infection rates for infants who are partially breastfed are “halfway” between those who are exclusively breastfed and those who are artificially fed. This suggests a dose-response effect. Kuate Defo (1997) argues that introducing other foods and liquids into the infant’s diet may reduce the “dose” of host-resistant factors found in breastmilk or, if the foods and liquids contain infectious agents, increase the infant’s exposure to pathogens. Other foods and liquids could also alter the gut flora, making the growth of pathogenic organisms easier.

A pooled analysis shows the effect of any breastfeeding on infant mortality due to infectious diseases in the developing countries (WHO, 2000). The analysis excludes deaths during the first week of life because these are thought to be related to

conditions determined before and during delivery, and on which breastfeeding has little or no impact. Additionally, because infants who are seriously sick from birth may be unable to breastfeed in the first place, excluding deaths during the first week of life avoids problems due to reverse causality. The analysis also excludes deaths from non-infectious causes, on which breastfeeding is not likely to have an impact.

Results showed that, between 0 and 6 months of age, infants who are not breastfed are four times more likely to die compared to those are breastfed. Results also confirm that the relationship between breastfeeding and infectious diseases depends on the infant's age. In other words, the younger the infant, the more the benefits of breastfeeding are pronounced. For example, compared to breastfed infants of the same age, infants under 2 months of age who are fed artificially are six times more likely to die. In contrast, compared to breastfed infants of the same age, artificially fed infants who are 2-3 month old are four times more likely to die. Finally, compared to breastfed infants of the same age, artificially fed infants who are 4-5 months olds are 2.5 times more likely to die.

Because many of the studies included in the pooled analysis did not provide any information about the pattern of breastfeeding (whether exclusive, predominant or mixed), it does not highlight the importance of exclusive breastfeeding. Subsequent studies have shown the importance of the pattern of infant feeding. In a multi-center cohort study (Ghana, India and Peru), Bahl et al. (2005) show that, excluding deaths within the first week of life, compared to those who are predominantly breastfed, infants who are mixed fed are 2.5 times more likely to die. The risk of dying for infants who are artificially fed is even higher: compared to infants who are predominantly breastfed, artificially fed infants are almost 9 times more likely to die. There were no significant differences in mortality between infants who are predominantly breastfed, and those who are exclusively breastfed. However, other

studies have provided convincing evidence on the impact of exclusive breastfeeding on morbidity and mortality. Exclusive breastfeeding has been demonstrated to reduce morbidity attributable to diarrhea (Bhandari et al., 2003); and to prevent deaths due to diarrhea and acute respiratory infections (Arifeen et al., 2001; Betran et al., 2001). In sum, there is conclusive evidence that exclusive breastfeeding prevents morbidity in infants, and a growing body of knowledge indicating the impact of exclusive breastfeeding on infant mortality due to infectious diseases.

b. Importance of appropriate infant feeding practices for mothers, families and society

Although the health benefits for infants are widely recognized and have been extensively reviewed in the literature, benefits to breastfeeding mothers, to their families and to the society have received less attention (WHO Global Strategy on infant feeding, 2002; Labbok, 2001; James and Dobson, 2005).

According to James and Dobson (2005) by increasing oxytocin levels, breastfeeding protects the mother from postpartum hemorrhage. Additionally, because it results in increased uterine contraction, breastfeeding allows the uterus to return to its pre-pregnant size more quickly. By delaying the resumption of the menstrual cycle, breastfeeding causes less menstrual blood loss, which conserves iron stores. The authors note that, for the mother, other benefits of breastfeeding include: a decreased risk for hip fractures to occur in the period after menopause; a level of bone remineralization that may exceed pre-pregnancy levels; an improved glucose profile for mothers with gestational diabetes; a decreased risk of type 2 diabetes; a decreased risk of ovarian cancer; and a decreased risk of breast cancer occurring prior to menopause.

Supporting the view of previous authors (see for example: Latham, 1977), the position of the American Dietetic Association (ADA) also emphasizes that breastfeeding provides significant economic benefits to the family and society (James

and Dobson, 2005). Breastfeeding allows the family to save the money that otherwise would be spent on infant formula, other milk substitutes, and feeding equipment. It also improves household food security and saves the family's disposable income for food for older children and adults. For example, in the United States, families that do not breastfeed spend close to \$700 for standard formulas in the first year. In this author's opinion, for many families in the developing nations who survive on less than a dollar a day, spending \$700 on infant food can be prohibitive.

The ADA also emphasizes that breastfeeding contributes to the health of the environment. This is because breastmilk milk is a natural resource that is renewable with each pregnancy, which is produced and delivered to the consumer (the infant) without using and wasting other resources, and which does not create pollution. In contrast to infant formula for example, breastmilk does not require manufacturing, packaging, shipping, disposing used containers, or even advertising. Breastmilk also conserves natural resources which would have been used during the manufacturing of replacement feeds (such as fossil fuels) and, through its effect on postpartum amenorrhoea when mothers breastfeed exclusively, it suppresses fertility and increases birth spacing, thus improving the health of the mother and the child while limiting population growth.

c. Breastfeeding: best practices

International agencies recommend breastfeeding initiation within less than 2 hours after delivery (see for example: WHO Global Strategy on Infant Feeding, 2002; WHO, 1998). According to Hartmann et al. (1985) following birth, the breast produces a thick, yellowish fluid which is primarily colostrum. The authors explain that colostrum is formed from the mixture of materials which are present in the mammary glands and ducts at delivery and which are progressively mixed with the milk that is newly secreted. They note that colostrum differs in composition from

mature milk: proteins, fat-soluble vitamins and minerals are present in higher concentrations, while fat and lactose are present in lower concentrations. They argue that, because the resulting solution is richer in immunoglobulins (especially IgA and antibodies), it provides protection against bacteria and viruses which may be present in the birth canal or which may be associated with human contact. The solution also contains antioxidants, which may function as traps for free radicals.

According to the American Dietetic Association (James and Dobson, 2005), because colostrum has a high content of anti-infective agents and growth-promoting factors, its role in fighting infections and in promoting growth and development of the newborn has been investigated, and is now widely acknowledged. The ADA notes that feeding colostrum reduces the risk of gastroenteritis; diarrhoeal disease; respiratory infections; ear infections; and influenza. Presumably, these benefits arise from both the passive immunity conferred through colostrum, and from the reduction or elimination of unsafe prelacteal feeding practices.

The World Health Organization and UNICEF (1992), describe breastfeeding “on demand” as follows:

“Mothers of normal babies...who are breastfeeding should have no restrictions placed on the frequency or length of their babies’ breastfeeds...they should breastfeed their babies whenever they are hungry or as often as the baby wants.”

In their review of the available evidence, Weigert et al. (2005) note that milk production is dependent on a physiological feedback mechanisms determined by the rate at which the breast is emptied. If the infant is breastfed according to a rigid schedule, rather than “on demand,” the breast may be emptied less often. This may, in turn, lead to problems such as “impaired milk production,” breast engorgement, sore nipples, and even to the development of mastitis. Breastfeeding “on demand” now constitutes the 8th step to successful breastfeeding and is one of the criteria for the

Baby Friendly Hospital Initiative which was launched in 1991 (WHO, 1998).

In addition to early initiation of breastfeeding and breastfeeding on demand, the WHO emphasizes the need for mothers to breastfeed exclusively. For the first six months of life, infants should not receive anything else apart from breastmilk and medical prescriptions, even water. According to Almroth et al. (2000), although the practice of giving water to infants is based on pervasive beliefs such as the need for infants to drink water so that they do not become “thirsty” or that water is “necessary for life” or even that water “prevents constipation” physiological and experimental evidence indicates that breastfed babies do not need any additional water. If an infant is exclusively breastfed, the water contained in breastmilk is adequate for meeting the infant’s requirement for water. For newborns, although colostrum contains less water compared to mature milk, because the infant is born with extra water, he does not require any supplement. Additionally, because breastmilk is low in solutes, an exclusively breastfed infant does not need water to help in evacuating any excess solutes. Even where temperatures are high and where humidity is low, exclusively breastfed infants maintain solute levels which are within the normal ranges, indicating that they receive sufficient water. According to Almroth et al. (1990), giving infants water may have adverse consequences. Firstly, although it has little or no nutritional value, by filling up the infant’s stomach, water serves to “reduce” the infant’s appetite for breastmilk and may lead to malnutrition. Secondly, as with other supplements, unclean water may contain pathogens which may, in turn, lead to infant illness.

d. Infant feeding options in situations where breastfeeding is not beneficial

Despite the many benefits of breastfeeding, there are a few medical conditions in which the infant should not be breastfed. According to the American Academy of Pediatrics (1997), these conditions include a) when the infant has severe galactosemia, and is therefore unable to metabolize galactose contained in milk products b) when the

mother is using illegal drugs and c) when the mother's immune system is compromised by diseases such as tuberculosis, infection with the human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS). For resource poor settings, the possibility of HIV transmission through breastmilk has led to renewed interest in alternative methods of infant feeding. These infant feeding options are reviewed in chapter 3.

3. Current Patterns of infant feeding in sub-Saharan Africa

In many parts of sub-Saharan Africa, breastfeeding is a strong cultural norm. However, while the advantage of exclusive breastfeeding are now well known, the primary pattern of infant feeding is one in which mixed feeding is the norm, but exclusive breastfeeding is not. This situation is not specific to sub-Saharan Africa: worldwide, less than 35% of infants under 4 months of age may be exclusively breastfed (WHO Global Data Bank, 2003). This estimate is based on data from the World Health Organization Global Data Bank. The data bank includes 94 countries, and it covers roughly 65% of the world's population of infants aged under 12 months. According to the data bank, with the exception of Sweden, Egypt and Saudi Arabia, whose rates of exclusive breastfeeding range from 50 to 60%, in many countries around the world, the rates of exclusive breastfeeding are well under 10%. Studies focusing specifically on Sub-Saharan Africa show confirm that the continent is no exception and that, while the practice of breastfeeding is common, infants are rarely exclusively breastfed (see for example: Semega-Janneh et al., 2001; Sellen, 2001; Earle, 2002).

Many years ago Jelliffe and Bennett (Jelliffe and Bennett, 1961) proposed a classification of traditional or folk practices in which they distinguished between harmful, neutral, and helpful practices, and practices whose efficacy, from a biomedical standpoint, is unknown. Many of the infant feeding practices that have

been reported in sub-Saharan Africa, and which are summarized below, can be classified as harmful, neutral, helpful or unknown with respect to their consequences for infant health. However, from the perspective of exclusive breastfeeding, with the exception of medically prescribed drops or syrups, any practice that results in the introduction of any substance orally should be classified as harmful, even if the specific substance is not toxic or otherwise dangerous.

a. Feeding prelacteals

In some sub-Saharan settings, before lactation is established, it is common to give infants other substances to drink within the first days of life. Prelacteal fluids that are commonly given to infants include: water (plain or sweetened with glucose or sugar); cow's milk (plain or sweetened with sugar); goat's milk; infant formula and; to a lesser extent, honey, herbal teas and a mixture of hot ash and water (see for example: Akuse and Obinya, 2002; Agnarsson et al., 2001; De Paoli et al., 2001; Okolo et al. 1999; Semega-Janneh et al., 2001; Sellen, 2000; Tschida, 2004).

As described and classified by Akuse and Obinya (2002), in Nigeria giving infants prelacteals is motivated by various beliefs including: the perception that her breastmilk is insufficient; beliefs that the newborn will suffer from dehydration, hypoglycaemia and neonatal jaundice; or traditionally motivated beliefs such as "cleansing and preparing the baby's gastrointestinal tract for digestion", "flushing the bladder", "resting the mother", providing variety in the baby's diet" or that colostrum is "too strong for the baby." In Tanzania, Sellen (2000) described common beliefs and motivations for giving newborns prelacteals, the most common of which were the beliefs that colostrum is "too heavy" for the infant's stomach and would therefore cause problems for the infant's digestion. Colostrum was also perceived to be "rotten" or "dirty" and was suspected to cause ill health for the infant.

As various authors have argued (see for example: Blomquist et al., 1994; Hossain et al., 1995), prelacteal feeds may lead to lactation failure for various reasons. Firstly, during the first three days or so following birth, milk production is hormone dependent, thereafter it depends on infant suckling. Giving an infant prelacteal feeds may therefore delay the onset of lactation dependent on infant suckling. Secondly, if the mother's breasts are not emptied relatively often, they risk becoming engorged. Thirdly, when an infant is given prelacteal feeds (or later feeds) from a bottle with a rubber teat, he is likely to develop "nipple confusion" and to fail to suck effectively from his mother. Fourthly, if they are contaminated, prelacteal feeds may also cause infectious diseases such as diarrhea. It is for these reasons that, unless medically indicated, the WHO and UNICEF (1990) discourage prelacteal feeds.

b. Giving breast milk substitutes to infants before they are six months of age

After breastfeeding is initiated, throughout Africa infants are typically supplemented with foods and liquids well before they are six months of age. Common foods and liquids include: water; milk (commercial infant formula, fresh or soured goat or cow's milk and home prepared modifications of evaporated or powdered milk); tea and herbal drinks; porridge (made of maize-meal, millet, sorghum or other locally available grains); commercially prepared infant cereal (common brands include Nestle, Purity and cerelac); eggs; fruits and vegetables (see for example: Papathakis and Rollins, 2004; Mamabolo et al., 2004; Poggensee et al., 2004; Sellen, 2000; Tschida, 2004).

Giving foods and liquids is motivated by well-established beliefs about the inadequacy of breastmilk for sustaining infants (as evidenced by the infant crying a lot or when the infant does not gain weight) or beliefs that the infant is "old enough to begin eating other foods." The need to go back to work or pressure from relatives and spouses may also contribute to the incentive to add other foods and liquids to the

infant's diet. The specific type of food or liquid given to infants depends on the infant's age; the type of products that are locally available; and the family's economic status. For example, infants in urban areas are more likely to receive commercial infant formula or commercially prepared cereals, while those in the rural areas are more likely to receive thin porridges and animal milk (see for example: Mamabolo et al., 2004; Semega-Jalleh et al., 2001).

c. Feeding infants during episodes of illness

In sub-Saharan Africa, cultural beliefs related to the management of illness may have important influences on infant feeding practices. Studies present conflicting results with regard to the influence of cultural beliefs and perceptions about infant illness on the practice of any breastfeeding. For example, in a study in rural Zimbabwe, Cosminksy et al. (1993), report that diarrhea in an infant was sometimes thought to be caused by contaminated breastmilk from a mother who had become pregnant again. The authors argued that, for this reason, if a breastfeeding infant had diarrhea, and if the infant's mother was pregnant again, the mother would respond to the disease by stopping breastfeeding, and by using an herbal home remedy. Conversely, some studies suggest that women tend to breastfeed more when their infants are ill and, especially in the case of diarrhea, to withhold foods believed to be responsible for the disease from the infant's diet (see for example: Bentley 1988; Nichter 1988; Rice 2000; Mull 1992).

Little is known about the composition of substances given to infants when they are perceived to be ill. As Varga et al. (1997) have proposed, this may be in part because people are often reluctant to discuss their use of traditional medicine. In our exploratory research in Pemba, respondents indicated that "gripe water" may be given to a baby who is perceived as having stomach problems; or to relieve gas after the baby eats. This gripe water is commercially made, it is bought in small bottles and is

often packaged in the same way as industrially made medicinal syrups, directions on most packages indicate that the water is destined to relieve colic. The composition of other locally prepared mixtures such as *muthi wenyonzi*, a traditional herbal mixture generally obtained from traditional healers among the Zulu South Africa which is sometimes given to infants (Bland et al., 2002), would need to be investigated.

4. A conceptual framework linking infant feeding behavior to the broader social, economic and political context

Following the social science tradition, in this dissertation, I draw from the ecological framework to link infant feeding behavior to the broader social, economic and political context in which the behavior occurs. The ecological framework recognizes the importance of cultural, environmental, and social systems on human behavior. Although ecological models vary in some respects (e.g. in terminology and areas of emphasis), they all make the point that in order to fully understand human behavior, one must understand the context in which that behavior occurs (Pelto and Pelto, 1975, Bronfenbrenner, 1979; McLeroy et al., 1988).

Adapted from the physical sciences to explain human behavior, Bronfenbrenner's ecological model (Bronfenbrenner, 1979) conceptualizes ecological space as operating on different levels of systems, each of which is incorporated within the next. At the most basic level is the individual, whose behavior is influenced by the interaction with the proximal context (family members, social acquaintances, work groups etc), or with the larger social system (economic forces, cultural beliefs and values, political actions) in settings such as the household, the hospital or the school (Bronfenbrenner, 1979).

In this framework, although proximal and distal contexts are kept separate in order to illustrate how each contributes to our understanding of behavior, these domains overlap to a certain extent and reciprocally influence each other (Eaton et al.,

2002). For example, a high level of unemployment among youth means that young people lack the resources to form their own independent households and are more likely to live with their parents, which may, in turn, increase their parents' influence on infant feeding decisions. Various authors have made the case that the ecological model is difficult to test. However, they have found it to be particularly useful in organizing factors associated with complex social problems, allowing better conceptualization and knowledge-building, while directing interventions at the appropriate system level (see for example: Bentley et al., 1999; Eaton et al., 2002).

The ecological framework has been used to investigate human behavior in various contexts, including smoking (Nigg et al., 2005); asthma (Alacci, 2005); unwanted pregnancies and sexually transmitted diseases (Bull and Shlay, 2005; Meade and Ickovics, 2005); physical activity (Pikora et al., 2003) and many others. It has also been used in various investigations of infant feeding (see for example: Tiedje et al., 2002; Bentley et al., 1999) in which it has been used to draw attention to the importance of directing interventions at levels including the individual and beyond

I found Figure 2.1 to be the most succinct way of presenting an ecological model. In the figure, social, cultural and political factors have been broadly grouped at different levels as follows: individual, interpersonal settings in which the individual operates, and the legal, political, economic or organizational elements of the society. Personal factors include cognition and feelings related to infant feeding as well as individual characteristics, such as "self efficacy" age or employment status. The proximate context comprises interpersonal relationships (with the infant, the partner, the family or with health care providers) and the physical and organizational settings in which these occur. The distal context includes structural factors i.e. the legal, political, economic or organizational elements of society, both at the national and at the international levels.

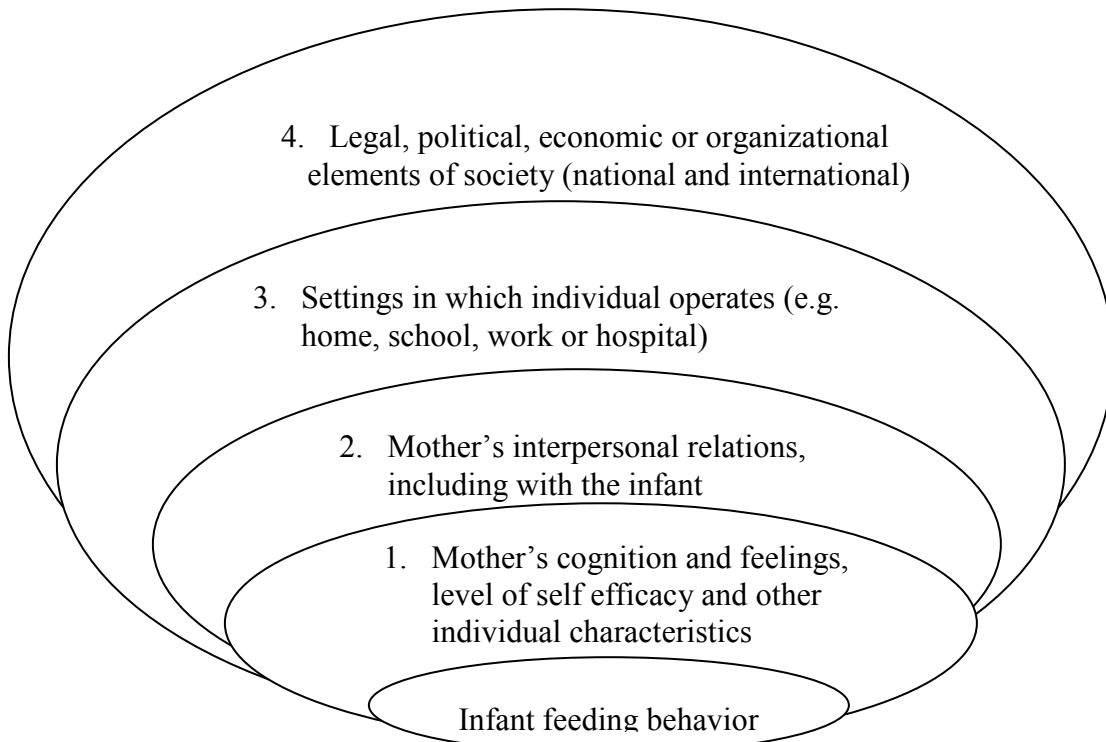


Figure 2.1: Ecological framework and broad categorization of factors influencing infant behavior.

In the following section, I provide examples of the specific factors that have been shown to influence infant feeding behavior at each of the levels 1) the individual; 2) interpersonal relations; 3) settings in which the individual operates and; 4) the legal, political, economic or organizational elements of society. These examples are not intended to be exhaustive, rather, they are meant to introduce the reader to the multiple factors that can influence infant feeding behavior at various levels defined in the ecological model. The examples focus on sub-Saharan Africa, as this is the geographic region in which the ethnographic research reported in this dissertation was conducted.

1. Individual level

a) Cognition, feelings and self efficacy

Various studies have documented women's perceptions and feelings about infant feeding and, consequently, how these perceptions influence infant feeding

behavior. For example, in sub-Saharan Africa, negative perceptions related to feeding colostrum have been reported in various settings (see for example: Akuse and Obinya, 2002; Davies-Adetugbo, 1997; Sellen, 2000). Other examples include beliefs about the inadequacy of breastmilk to satisfy the nutritional needs of the infant (see for example: Kiarie et al., 2004; Semega-Jalleh et al., 2001) or the belief that artificial feeding is “better” than breastfeeding (Elliott et al., 1985).

Applying Bandura’s social cognitive theory in breastfeeding, “self efficacy” is defined as the mother’s confidence and belief in her ability to successfully breastfeed (Dai et al., 2003). “Self efficacy” has often been associated with success in initiating and maintaining breastfeeding (Dai et al., 2003). Conversely, lack of “self efficacy” in breastfeeding has been associated with perceptions of insufficient milk which may in turn lead to the supplementation of breastmilk or even a complete cessation of breastfeeding (Hill et al., 1996). A woman’s own past experience with breastfeeding (which is related to her age); her physical and emotional health; her experiences with other breastfeeding women in the community; and the influence of significant others on her infant feeding behavior may exert an important influence on the woman’s breastfeeding “self efficacy” (Dennis, 1996).

b) Mother’s health status

The mother’s health status is a common reason for stopping to breastfeed (Drejer, 1980; WHO, 1989; Winikoff et al., 1988). Howard and Howard (2004) recommend that, with the exception of situations where the mother is incapacitated or in situations where the mother’s treatment procedure (e.g. surgery) is not compatible with breastfeeding, the mother should continue to breastfeed. The authors note that breastmilk pumping and other simple measures such as indicating the desire to continue breastfeeding to the health care provider may allow the mother to continue breastfeeding successfully, even when she is ill.

While the issue of breastfeeding for mothers who are infected with HIV has been widely discussed, it has often been investigated in relation to the infant's (potential) HIV infection, rather than concern for the mother's health (Sedge et al., 2004). A recent study suggested that breastfeeding when HIV infected may lead to a quicker progression from HIV to AIDS in the mother (Nduati et al., 2001). However, subsequent investigations have indicated inconclusive evidence (Coutsoudis et al., 2001; Sedge et al., 2004).

c) Other maternal characteristics

Other characteristics of the mother which may affect her infant feeding behavior include her age (see for example: Bentley et al., 1999), her level of education (see for example Duong et al., 2005) and, where possible, her choice to work part time or not at all (see for example: Duong et al., 2005; Rea and Morrow, 2004).

2. Interpersonal level

a. Maternal responses to infant's cues

Piwoz (1994) states that, although social and cultural influences on infant feeding practices and decisions have been studied for many years, until recently, most studies assumed a simple causal relationship between maternal and household socio-economic circumstances and feeding decisions. She notes that the issue of infant feeding was often approached from "a narrow viewpoint in which the infant is seen as a passive receiver of food and the mother as the "giver of food" and in which the "mothers' age, education, attitudes, knowledge or time availability were considered to directly influence how she feeds her children." In this viewpoint, mothers were assumed to have preconceived notions about infant feeding (such as beliefs about breastfeeding, or bottle feeding) and to make changes to the pattern of feeding based on their personal experiences and circumstances (such as the demands of paid labor).

Piwoz proposes that, in reality, the decision-making process may not be so one-sided and that mothers make feeding decisions in response to their infants' perceived needs, health and behavior. She provides the example of perceptions about insufficient milk, which is commonly reported as a reason for supplementing or abandoning breastfeeding, and which is often based on the infant's "fussy" behavior during and after feeding, particularly crying. She also proposes that the infant's health could affect breastfeeding behavior and that, for example, children in ill health may change their feeding behavior, cease to breast-feed as a result of their inability to suckle, or be weaned by the mother based on her decision regarding the appropriate feeding method for the illness that the infant is suffering from.

b. Maternal responses to advice from family, relatives, traditional birth attendants and health care providers

As mentioned above, beliefs about the mother's "insufficient milk" often motivate the addition of other foods and liquids into the infant's diet and may even lead to the discontinuation of breastfeeding, well before the infant is six months of age (Greiner et al., 1981; Piwoz, 1994; Latham, 1981). In the developing nations, when a mother complains about her infant's "fussy" behavior, and suspects that this is the result of her milk being "insufficient" or inadequate for the infant's needs, friends, relatives, health care providers and others who she consults may encourage her to introduce other foods and liquids into the infant's diet (Latham, 1981). In particular, as various authors have argued, mothers are particularly susceptible to prescriptive advice from older women such as the infant's grandmother or traditional birth attendants (Bentley et al., 1999; Aubel et al., 2004) and from formal health care providers such as pediatricians (Latham, 1981).

3. The home, the health care setting and the workplace

For a long time, the negative impact of health care settings on the initiation and the establishment of breastfeeding have been well known. As Elliott et al. (1985) suggested based on a survey of Kenyan mothers who had delivered in hospital settings, the following hospital practices discouraged breastfeeding: providing samples of free infant formula to new mothers; separating the mother from the baby; scheduling breastfeeding sessions; and providing supplementary infant formula and water. Similar reports served as the impetus for the establishment of the Baby Friendly Hospital Initiative in 1992 (WHO, 1998). A review of the available evidence conducted 6 years after the establishment of the BFHI has drawn attention to the importance of appropriate hospital practices in positively influencing breastfeeding (WHO, 1998).

Within the home, various conditions may encourage or constrain her ability to breastfeed. For example, in many settings in the developed nations where the female breast often has sexual connotations, the presence of male relatives in the home may discourage mothers from breastfeeding (see for example: Wiemann et al., 1998; Swanson, 1988). When large, extended families live together, the possibility of interference with the mother's infant feeding practices is real, both in the developed nations (see for example: Bentley et al., 1999) and in the developing nations (see for example: Deang et al., 1988; Espinoza, 2002). Sometimes, extended families may provide support for the mother, allowing her to breastfeed her infant (see for example: Espinoza, 2002) while, at other times, family members may encourage the mother to introduce other foods and liquids to the infant's diet in response to infant crying or failure to gain weight (see for example: Bentley et al., 1999).

The need to return to formal employment has often been cited as a reason for supplementing the infant with other foods and liquids, or even for weaning infants

well before six months of age (see for example: Lindberg, 1996; Visness and Kennedy, 1997). In the United States for example, continued breastfeeding is often a luxury that is only available to women who are not formally employed outside of the home, often because they are sufficiently well off (Ryan, 1997; Wright, 2001). To address the needs of women who work for pay outside of the home, the International Labor Organization has proposed the following to promote breastfeeding in the workplace: paid leave; providing facilities where mothers can express breastmilk and/or breastfeed their infants (restrooms are not considered acceptable); allowing mothers to take breaks during the working day to express breastmilk and/or breastfeed their infants; and allowing mothers to work part-time; and encouraging a supportive environment in which mothers who choose to breastfeed are not discriminated against (ILO, 2000).

4. Legal, political, economic and religious aspects of society

On a more distal level, as proposed by Sellen (1998), social, economic and political phenomenon, such as migration, famine and employment opportunities have significant influences on feeding practices. For example, the absence of infant formula could constrain adopting this method of infant feeding, while the ready availability of animal milks and related products may be an incentive for their use. In this regard, the establishment of the International Code of Marketing Breastmilk Substitutes, and the subsequent adoption of the code in various countries, led to a change in the larger, more distal levels, which, in turn, influenced infant feeding practices, particularly in countries such as Papua New Guinea which actively enforced the code (Marshall, 1984).

Marshall (1988) has argued that, in addition to their involvement in economic activities such as domestic work, subsistence food production and petty commerce, a large number of women in the developing countries also work outside of the home for

pay. Marshall proposes that more and more families in developing countries rely on the women of the household for cash income, in part because employment opportunities for men are fewer, and in part because men have abandoned their households. She notes the incompatibility of most of the economic activities in which women participate with infant care. She suggests that a) because formal employment may result in a loss of child care time, the mother is less available for breastfeeding and b) the rigidly scheduled nature of most paid work and the long periods of physical separation make continued breastfeeding difficult and conflict with the ideal of breastfeeding “on demand.” She suggests that these factors probably explain the negative association observed in the developing countries between maternal employment and the prevalence of breastfeeding.

5. Summary

In sum, there is strong empirical evidence to support the generalization that infant feeding behavior is affected at multiple levels, from individual to societal. In emphasizing the embeddedness of infant feeding behavior in cultural contexts, Krumeich et al. (2001) provide a particularly illustrative example:

“In Dominica, women generally head their own households or live in their mother’s household. They have to make a living for themselves and their children. Female status in Dominican society is closely linked to the number of children women have and to their ability to permanently hold on to a partner. Men’s status strongly depends on their virility, the number of sexual partners they can conquer, and the number of children they are able to procreate. On the other hand, being able to resist marriage is a proof of masculinity, for it reveals that a man does not let himself be captured by tenderness toward a woman. Thus, for men, there is a need to have many female partners who cannot claim him to be theirs. At the same time, he must show the community that he is the father of the children born out of these relationships. He does so by providing infant

formula to the mothers of his children. This publicly shows which children are his and offers him the opportunity to evade marriage ... women generously accept. Since the formula can be used for other children as well, it is a welcome contribution to the household. This explains why Dominican women and men do not always share primary health care's preference for breastfeeding."

The authors' example illustrates the possible link between women's economic autonomy, the importance of motherhood and the ability to attract men—which are features of the society in which the men and women live—and the use of infant formula instead of breastfeeding (i.e. infant feeding behavior).

5. Conclusion

In this chapter I have outlined the crucial role that appropriate infant feeding practices play in achieving optimal health outcomes, particularly during the first six months of infant life. I have also reviewed common infant feeding patterns in sub-Saharan Africa, and presented a conceptual framework linking infant feeding behavior to social and cultural factors at various levels, including the individual, inter-personal and the health care organization. The next chapter is devoted to a general literature review of the two subjects that are the specific foci of my studies – infant feeding within the context of HIV and infant feeding within the context of neonatal care.

CHAPTER 3

INFANT FEEDING IN SPECIAL CIRCUMSTANCES IN SUB-SAHARAN AFRICA: HIV AND CARE OF THE NEWBORN

I refer to “normal circumstances” as situations when both the mother and the infant are in good health, and when the environment in which the mother-child dyad find themselves does not warrant particular concern (for example, when the country is not at war). Although infant feeding practices have often been investigated in “normal circumstances,” they have less commonly, been investigated in “special” circumstances. In this dissertation, I have chosen to focus on infant feeding in the context of two “special circumstances.” The first one is an investigation of infant feeding when the mother is ill. Within the repertoire of possible investigations of infant feeding during episodes of maternal illness there are a large number of potential topics one could investigate (such as feeding when the mother has galactosemia or when she has tuberculosis). I have chosen to focus on HIV/AIDS.

The second “special circumstance” is infant feeding during the newborn period. One could argue that the newborn period does not constitute a “special circumstance.” However, in my view, because the newborn period (from birth to the first 28 days of life) is characterized by rapid changes, both physiological and behavioral, it should be considered a special circumstance. Additionally, the importance of establishing appropriate infant feeding practices almost immediately after birth warrants the consideration of this period as a “special circumstance.”

This chapter therefore focuses on infant feeding within the context of HIV and in relation to neonatal care. In reviewing HIV and infant feeding, I highlight infant feeding methods recommended for HIV infected mothers—including the use of animal milks and infant formula—and the challenges that these pose for infant nutrition and health. In reviewing problems specific to the newborn, I draw attention

to issues related to the initiation of early and exclusive breastfeeding, including the feeding of colostrum and its importance for newborn health and survival.

Part I. Infant feeding and Mother-to-child transmission of HIV (MTCT)

Mother-to-child transmission of HIV (MTCT) accounts for the vast majority of pediatric HIV-1 infection (UNAIDS, 2000). It is an important problem in sub-Saharan Africa where at least 90% of the world's HIV-infected children live (Dabis, 2000). In this region of the world, 4.5 million children are reported to have been infected since the beginning of the HIV-1 pandemic (UNAIDS, 2000). In the absence of any medical intervention, about two-thirds of MTCT probably occurs during pregnancy or at delivery, and about one-third through breastfeeding (DeKock et al., 2000).

Although breastfeeding accounts for only part of mother-to-child transmission of HIV, in countries where both fertility and rates of HIV infection among pregnant women are high, particularly in sub-Saharan Africa, the issue of HIV transmission through breastfeeding is of public health importance (DeKock et al., 2000; UNAIDS, 1998).

1. Infant feeding options for mothers with HIV: the dilemma

As previously discussed, breastfeeding has been shown to improve child survival by protecting against diarrhoeal diseases, pneumonia and other potentially fatal infections, while also enhancing quality of life through its nutritional, psychosocial and other benefits. The discovery that HIV can be transmitted through breastmilk has precipitated a public health dilemma, particularly in countries where HIV affects significant proportions of the population and where breastfeeding is the cultural norm (DeKock et al., 2000; UNAIDS, 1998). Further compounding the dilemma is the observation that most breastmilk transmission of HIV-1 may occur in the first few months of life, a time when the benefits of breastfeeding are highest in resource poor settings, and when replacement feeding is most risky (WHO, 2000; Nduati et al., 2000).

The risk of mother-to-child transmission of HIV through breast milk poses unique challenges for infant feeding, and is now one of the very few medical conditions in which breastfeeding may not be recommended. Based on a meta-analysis of studies investigating MTCT, Dunn et al., (1992) estimated the overall risk of MTCT to be 44%, and the risk attributable to breastfeeding to be 14%. Subsequent studies have confirmed that about a third of HIV transmission from the mother to the child occurs through breastfeeding (see for example Coutsoudis et al., 2001). There is conclusive evidence that, for infants born to infected mothers, replacement feeding (i.e. no breastfeeding) coupled with anti-retroviral therapy for the mother can prevent deaths due to HIV. As Gaillard et al. (2004) conclude, the rate of HIV transmission from the mother to the child can be reduced from around 44% to 1% when HIV positive women are provided with antiretroviral therapy during the last trimester of pregnancy and with good obstetric care during delivery; and when the women avoid any breastfeeding. The authors note that, because this complex and expensive intervention requires that all of the five conditions for replacement feeding (commonly referred to as AFASS: Affordable, Feasible, Accessible, Safe and Sustainable) are met, it is not suitable for most resource poor settings.

The few studies which have investigated the effect of anti-retroviral therapy provided to breastfeeding mothers and/or their infants have indicated that breastfeeding reduces the efficacy of anti-retroviral therapy (Gaillard et al., 2004). There is no definitive estimate for the rate of MTCT through breastmilk when infants and/or their mothers are provided with anti-retroviral therapy (Shapiro et al., 2005a). The recent finding in Botswana that, compared to infants who are formula fed, infants who were provided with AZT and who were breastfed had a higher risk of mortality (Shapiro et al., 2005b) warrants further investigation.

2. Biological and behavioral determinants of MTCT through breastmilk

According to the World Health Organization (2001), high maternal viral load measured during pregnancy or after delivery and a low T-cell helper/suppressor (CD4/CD8) ratio is associated with an increased rate of MTCT through breastfeeding. Inflammatory conditions such as mastitis, fissures and breast abscesses, which may be caused by poor breastfeeding techniques (e.g. poor attachment) or by poor vitamin A status may also be responsible for increased rates. A suggested mechanism for the associated increased risk of transmission is that inflammation-induced openings in the mammary epithelium allow plasma constituents, including HIV, to enter breastmilk. A new pregnancy while breastfeeding may also be associated with increased risk of MTCT for the breastfed infant.

The World Health Organization also notes that increased rates of MTCT through breastfeeding are associated with the infant's age and that, although the risk persists as long as breastfeeding continues, it is greatest in early infancy (i.e. before 6 months of age). Rates may also depend on the volume of milk ingested. Presumably, the more milk the infant ingests, the more he is exposed to the virus. Other considerations include infant oral thrush before the infant is 6 months of age and pre-term delivery.

3. Infant feeding options for HIV infected mothers

UNAIDS and its two partner agencies, UNICEF and WHO, stress that the risk of infants dying from causes linked to malnutrition and inappropriate hygienic practices are highest in resource poor settings(UNAIDS, UNICEF and WHO, 2004). In these settings, the risk of transmission of the virus needs to be balanced against the increased risk of morbidity and mortality from infectious diseases and other negative consequences when infants are not breastfed. The agencies propose that recommendations for HIV-infected mothers to artificially feed their infants should

only be made when the following conditions apply: a) there is an uninterrupted, accessible supply of formula feeds for at least 6 months; b) there is access to safe drinking water and; c) there are means to boil water for use in formula preparation and sterilizing utensils. The conditions for the avoidance of all breastfeeding for HIV-infected mothers are commonly referred to as “AFASS.”

The World Health Organization currently recommends the following options for HIV-infected mothers to consider: exclusive breastfeeding, wetnursing, the use of milk banks, heat treated expressed breastmilk, infant formula, animal milks such as cow or goat’s milk.

a) Exclusive breastfeeding

In the absence of anti-retroviral therapy, the finding that, compared to mixed feeding, exclusive breastfeeding carries a lower risk of MTCT of HIV and that it may carry a similar risk compared to replacement feeding (Coutsoudis et al., 1999) raises new hopes that MTCT can be reduced in conditions where safe and nutritionally adequate replacement feeding is difficult to achieve. A recent study conducted in Zimbabwe (Iliff et al., 2005) found similar results for the lower risk of exclusive breastfeeding, and suggests a dose-response effect. In the study, it was found that, at 6 months, compared to exclusive breastfeeding, mixed feeding was associated with a 4-fold greater risk of HIV transmission, while predominant breastfeeding was associated with a 2.6-fold increase.

There are plausible biological mechanisms for the observation that exclusive breastfeeding is better than mixed feeding. As proposed by Smith and Kuhn (2000) and Rollins et al. (2001), the first is a mechanism through which dietary antigens and pathogens provoke inflammatory responses or alter the infant’s gut integrity. The second is a mechanism through which the components of breastmilk promote beneficial intestinal microflora, which in turn increases resistance to infection. The

third is a mechanism through which breastmilk modulates anti-microbial, anti-inflammatory and immunological processes and the fourth is a mechanism through which exclusive breastfeeding maintains breast health in the mother, thus reducing the virus shed into breastmilk.

Both the Coutsoudis and the Iliff studies were observational studies in which mothers “self-selected” in to their preferred mode of infant feeding. Because mothers who were in good health may have chosen to breastfeed exclusively, there may be a problem of reverse causality. This limits the extent to which these studies can provide the basis for conclusive evidence.

To develop fully convincing evidence would require randomizing individual HIV positive mothers to a given infant feeding behavior (exclusive or replacement) and assuring compliance to the assigned mode of infant feeding.

Ross and Labbok (2004) have argued that random assignment may be justified on the basis of uncertainty concerning risks of each infant feeding mode. However, they emphasize that it is unethical to assign replacement feeding without, at the same time, improving the “health environment” in the environment (such as hygiene, sanitation, water supply and health care) and economic conditions (by providing free or subsidized supplies of replacement feeds). But such improvements would limit the applicability of the trial results to real conditions. In this author’s view, further compounding the issue of random assignment is the difficulty of *compliance* for mothers randomized to any mode of infant feeding. To date, there has been only one study in which HIV-infected women were randomized to two infant feeding arms: infant formula or exclusive breastfeeding (Nduati et al., 2000). In the study, the difficulty of compliance was well noted.

Even before the advent of the HIV pandemic, the risks of transitioning from breastmilk to replacement feeds were widely discussed (see for example: Rowland et

al., 1978; Mockenberg, 1973; Pelto et al., 2004). As described by Jelliffe and Jelliffe (1978), up to six months of age, breastfeeding provides considerable benefits for infant health, however, thereafter, breastmilk is no longer a completely adequate source of nutrition, and it needs to be supplemented with other foods and liquids. With the introduction of weaning foods, infants experience an increased risk of morbidity, particularly when the transition is not well managed, putting them at a high risk of malnutrition and/or infection. The authors coined the term “weanling dilemma” to describe this problem.

As proposed by the WHO/UNICEF/UANAIDS (1998), in general, HIV infected mothers who have chosen to breastfeed should breastfeed their infants *exclusively* from birth to 3 or 4 months of age. Thereafter, because the risk of HIV transmission may outweigh the protective benefits of breastmilk, mothers should quickly transition from breastfeeding to replacement feeding. In the HIV and infant feeding literature, this “quick transition” is commonly referred to as “rapid weaning.” To this author’s knowledge, there have been no studies investigating the issue of rapid weaning for HIV infected mothers, even in poor families in sub-Saharan Africa. Anecdotal reports suggest that rapid weaning is associated with increased infant morbidity and mortality, particularly for mothers who do not have adequate weaning foods.

b) The use of modified breastmilk

a. Breast milk obtained from wetnurses

Historically, wetnursing seems to have been a long established practice in many developing countries (Riordan and Auerbach, 1993). Traditionally, a child whose mother had died or whose mother was unable to breastfeed was either fed by women who were also breastfeeding their own infants, or who was adopted by a lactating mother whose child had recently died (Counts, 1984). Marshall (1984) reports that, in some communities, wetnursing an infant during the mother’s absence

was an alternative to the use of the bottle or the cup for providing milk. For example, after the Papua New Guinea government enacted legislation in 1977 to make feeding bottles available only by prescription from authorized health personnel, access to a convenient substitute for breastfeeding became limited. In addition, because various educational programs in the country promoted breastfeeding, and training programs for health personnel emphasized breast milk as proper infant food, the wetnurse became a “natural” alternative to the use of the bottle or the cup for providing milk to an infant during the mother’s absence.

There are, however, challenges to the use of wetnursing. According to Lawrence (1994), there is the potential risk of HIV transmission from the wetnurse to the infant if the wetnurse is infected, or from the infant to the wetnurse if the infant is infected and the wetnurse has cracked nipples. There may also be interruption of the mother’s own milk supply, a difference in milk composition if the babies are of different ages, failure of the mother to “let-down”, refusal of the infant to breastfeed, and possibly a negative impact on other children in the household. For wetnursing to be successful, Lawrence recommends that the wet-nursing mother should be healthy and well-nourished, she should not have any general or local infection, and she should not take any medications or smoke. She advises that, if the wetnursing woman is also breastfeeding a child of her own, the two infants should be close in age and should be free of infection, especially thrush.

UNAIDS, UNICEF and WHO guidelines (UNAIDS, 1998) recommend that, if a family considers wetnursing as an infant feeding option: a) the wetnurse should be offered counseling and testing b) she should be able to practice safe sex in order to remain HIV negative as she breastfeeds the infant and c) as with breastfeeding in normal circumstances, she should breastfeed the infant “on demand.” The guidelines stipulate that no payment should be involved in the arrangement. Baumslag and

Michel (1995) propose that payment discourages the “commercialization of wetnursing,” which was observed in the 17th and 18th centuries in Europe. “Commercialization of wetnursing” was hypothesized as having contributed to adverse infant health outcomes, either for the wetnurse’s own child, who was abandoned for another, or for the wetnursed child who was competing for breastmilk with other children “paying” for the wetnurse’s services.

A significant body of literature points to the variety of beliefs related to wetnursing in sub-Saharan Africa (see for example: Cosminksy, 1993; Dettwyler, 1987; Mabilia, 1996; Tietjen, 1984; Thairu, 2002). In a study investigating infant feeding decisions in the context of HIV in Zimbabwe, Gavin and colleagues (1999) report that interviewees usually noted that wetnursing was “practiced in other cultures” and not in their own. Women were concerned about having a stranger wet nurse a baby because of the chance that the wetnurse may be HIV positive. For my Master’s thesis research (Thairu, 2002), I found that questions about wetnursing elicited a complex and diverse set of beliefs. Beliefs which indicated the cultural acceptability of wetnursing included notions about the quality of breastmilk. While beliefs that may prevent women from considering this as an infant feeding option were related to concerns about breastmilk being a “conduit” of kinship, notions about cultural norms that prohibited wetnursing, concerns about the wetnurse being “*sick*”, and concerns that the milk would not be “*the same*. ” Clearly, considerations of wetnursing as an infant feeding option for HIV-infected mothers would require attention to these cultural issues.

b. Breastmilk obtained from milk banks

As Lawrence (1994) proposes, historically wetnursing was an immediate alternative to replace mothers’ milk both in developed and developing nations. Before and during the 19th century, the medical profession (in Europe and in the United

States) wanted to remove the control of infant feeding from wetnurses, especially as wetnurses became increasingly difficult to locate, and those available tended to be in poor health. This partly contributed to the collection and the storage of donated human milk.

Lawrence (1994) notes that, worldwide, donated and “banked” human milk is generally used for infants who are premature, and thus whose nutritional requirements exceed those available with breast milk which has not been supplemented. She explains that, in such cases, donated breastmilk often added to the mother’s own milk to increase the calorie and nutrient content that would match the requirements of these high-risk infants. She notes that donor milk may also be used when the mother is unable to breastfeed her infant (e.g. when she is severely ill), or in extreme cases when the older sibling can only survive on breastmilk.

In her review of the use of milk banks for the La Leche League (a breastfeeding support group that operates in most industrialized countries and in some developing countries), Arnold (2000) cautions the informal sharing of milk between nursing mothers, mostly because of the potential risks of HIV transmission, hepatitis and other viruses through breastmilk. Various authors have noted that careful selection and screening of donors removes the concerns about the transmission of disease (Orloff et al., 1993; Welsh et al., 1979; Wills et al., 1982). They also note the need to pasteurize donated milk before feeding it to infants to avoid the transmission of any infective organisms.

Henderson et al. (1998) and Wardell et al. (1981), note the risk of losing variable amounts of important components of breastmilk during pasteurization, including immunoglobins (IgA, IgM and IgG), lactoferrin, certain vitamins, linoleic and linolenic acids in milk. According to Henderson et al. (1981), pasteurization may even destroy milk lipases completely. Arnold (2000) concludes that, in comparison to

the mother's own milk, pasteurized donated milk has a lower nutrient content and is less preferable. However, in comparison to replacement feeds such as infant formula or animal milk, which do not contain these nutrients in the first place, Tully (2000) argues that donated and banked milk is the next best feeding method for infants after a mother's own milk.

According to Tully (2000), donor milk banking is a labor-intensive operation that includes the following: recruiting and screening donors; collecting donated milk; storing and processing the milk; and distributing it to recipients. Additionally, if donated breast milk is fed with a bottle, some of the dangers of artificial feeding, including an increased risk of infection if the bottle used is not properly cleaned, may still be present. Arnold (2000) argues that it is partly for these reasons that donor milk banking has been negatively affected and that the use of milk banks has declined in many countries. She notes, however, that the decline has not been universal and that, in some countries such as Brazil, India, Britain, China, Japan, France and the United States, new donor milk banks have been opened, while old ones continue to operate. She notes that, in the United States in particular, milk banks have been more receptive to clinical uses considered as "alternative medicine," and have cooperated with government agencies to develop standards for safety.

In many parts of the world, strong cultural beliefs and expectations may run counter to the use of milk banks (Maher, 1992). For example, in Kuwait, Al-Naqeeb et al. (2002) note that "*donor milk banking as conducted in western society is not considered to be ethical in Muslim society, where the milk donor and the recipient are required to know each other.*" Another example illustrating cultural barriers to the use of banked milk is a study conducted in Jos (Nigeria) where 71% of women interviewed would not use banked milk to feed their infants if they tested positive for HIV, primarily because they feared the transmission of diseases from milk donors to

their infants (Ighogboja et al., 1995). In my own research for the Master's thesis (Thairu, 2002), I found that respondents expressed beliefs related to wetnursing that were strikingly similar to those for milk banks. These included: restrictions on using donor milk either only among close kin (sisters) or not at all because of fear that breastmilk is a "conduit" of kinship; and the fear of disease transmission, particularly from the donors. As with wetnursing, there appear to be strong cultural beliefs related to the use of milk banks, these would need to be addressed if this option was to be considered for HIV infected mothers.

c. The use of heat treated breastmilk

Initially, after the discovery that breastmilk contained infective HIV, a few authors believed that letting a mother's expressed breast milk stand at room temperature could inactivate the HIV and could be a viable infant feeding option for HIV infected mothers (Isaacs, 1990; Orloff, 1993; Thormar, 1987). The authors hypothesized that human fatty acids became incorporated into the lipid membranes of the virus, thus destabilizing the membrane, making it rupture, destroying the virus. Medium chain saturated fatty acids (i.e. fatty acids which have no double bonds, and which contain 10-16 carbon atoms) and long chain unsaturated fatty acids (which have 16-28 carbon atoms) were believed to be responsible for the inactivation.

However, Chantry and colleagues (2000), found that, even after allowing HIV infected milk to stand at room temperature for six hours, the virus was still not inactivated. But directly heating infected expressed breast milk and bringing it to a boil (for instance over a cooking fire) resulted in decreased HIV-1 infectivity. However, the difficulty of controlling the temperature without a thermostat while boiling and, consequently, the potential loss of important components in breastmilk presented serious challenges. The possibility of bacterial contamination of expressed breastmilk milk brought to a boil over a cooking fire was an additional consideration.

In justifying the need for an effective, low cost method, Jeffery and Mercer (2000) note that, although the Holder pasteurization method (submerging bottles in a shaking water bath carefully maintained at a temperature of 62.5°C for 30 minutes) has been shown to inactivate the virus, the method requires sophisticated equipment, plus heating the milk for as long as 30 minutes. This makes Holder Pasteruziation difficult to use in a domestic setting.

The authors then devised a simple and inexpensive method by which a mother's own expressed breastmilk can be pasteurized to inactivate the virus, while preserving the nutritional content and most of the immunological factors in the milk. This method can also be easily carried out in a domestic setting. The authors named their technique "Pretoria pasteurization" probably because they conducted most of their experiments in Pretoria, South Africa. The method, which is now commonly referred to as "heat treating expressed breastmilk", is based on the principle of "passive heat transfer" and on the consistent observation that, with the exception of very high altitudes, the boiling point of water is constant within a narrow range. This latter principle obviates the need for using a thermometer or thermostat. The procedure is as follows: a) place the expressed breastmilk in a container b) place the secondary container in a large (primary) container holding water c) bring the water to a boil (e.g. over a cooking fire). Jeffery and Mercer found that the best results are obtained when the primary container of water is an aluminum pot, and the secondary container of expressed breastmilk is a glass peanut butter jar—which are both easily accessible to women, even in resource-poor areas. With this equipment, Jeffery and Mercer were able to maintain milk at temperatures between 56°C and 62.5°C for up to 15 minutes.

A year later, Jeffery et al. (2001) investigated whether the method could reliably inactivate HIV in breast milk. They collected specimens of expressed breast

milk from women who were known to be HIV-positive, used standard laboratory procedures to co-culture and pasteurize the samples, and conducted molecular tests to determine whether any viable virus remained in the samples. They compared each of the sample with a control portion of the same specimen which had been co-cultured without pasteurization. They found no evidence of viral replication in any of the aliquots which had undergone pasteurization, and concluded that the method effectively inactivates HIV in human milk. Two years later, they found no evidence of bacterial contamination for samples of previously infected breastmilk which had been pasteurized (Jeffery et al., 2003).

Although Holder pasteurization has been shown to destroy some of the nutrients and the anti-infective properties of breastmilk, further research is needed to determine whether the new method developed by Jeffery and Mercer leads to loss of important nutritional components. Latham (personal communication) proposes that, as with banked milk, heat treated expressed breastmilk may contain less nutrients than fresh breastmilk, but it still remains preferable to other alternatives such as infant formula or cow's milk, which often contain none of these nutrients in the first place.

In this author's view, cultural acceptability is an additional consideration. Firstly, mothers have to be willing to express their breast milk. Secondly, mothers have to be willing to pasteurize it. Results from the field indicate that there are strong cultural beliefs that would run counter to heat treating expressed breastmilk. For example, in an unpublished study in Zambia, NFNC (1999), note that "*although some women may be willing to express their breastmilk, from time to time, suggestions that it could be boiled were met with surprise and disbelief.*" In Zimbabwe, Gavin et al. (1999) state that many women in their sample "considered expressing an unsanitary practice." In South Africa, Chopra et al. (1999) note that mothers "*found it too*

difficult to express and store their milk [...] even for women who successfully expressed their breastmilk, the idea of bringing it to a boil was dismissed."

d. Use of other types of milk to feed infants

d-1) Infant formula

The risks of using infant formula in the developing nations have long been recognized but, until the 1970s, they were not well articulated. As reported by various authors (Bischoff, 1988; Bronson, 1980; Chetley, 1994; Jelliffe and Jelliffe, 1978; Vlahou, 1994; Walker 1993), in the 1970s, Nestle and other infant-formula makers were heavily criticized about their marketing tactics in the developing world. In particular, the manufacturers routinely bombarded developing countries with ads featuring fat, formula-fed babies and distributed free samples in maternity wards to attract women to their product. By the time the samples ran out, women's own breastmilk had usually dried up. But because few of the women could afford to purchase any formula, they diluted it to make it last longer. Women may also have used contaminated water to prepare the formula. For these reasons that increasing rates of infant morbidity and mortality observed in many developing countries were attributed to the use of the infant formula. The abusive practices, and their deleterious consequences for infant health and survival, led to the creation of the World Health Organization's "International Code of Marketing of Breast-milk Substitutes" to guide the conduct of infant formula makers, particularly in the developing nations (WHO, 1981).

More recently, the HIV/AIDS pandemic poses increasing challenges to the use of infant formula in developing countries. According to the Joint United Nations Program on HIV/AIDS (UNAIDS, 1998) even when widely available, the cost of infant formula is often beyond the means of poor families. Furthermore, many women in developing countries lack easy access to safe, clean water and fuel to prepare infant

formula safely, or simply have no time to prepare formula feeds. This often precludes the use of infant formula for mothers living in poor households, even if they are infected.

The risks of using infant formula are also recognized in the developed nations where, presumably, mothers can afford infant formula and can prepare it safely. For example, Baumslag and Michels (1995) note that, even when a safe can of formula is used with safe water, if formula is not mixed as instructed on the label, it can cause serious health problems. Mothers may add “extra scoops” or use a “heaping scoop” feeling that this will be “a treat for the baby” or that it will help the baby to “sleep more soundly, cry less, grow faster, or happier.” In these situations, there is a high risk of hypernatremia (too much sodium) which might cause convulsions or even death.

Baumslag and Michels (1995) also note that the composition of formula, a chemical preparation, is subject to human error. The authors note that, even in the developed world where there has been little adverse press on infant formula, formula has not always been safe. For example, in the United States, between 1983 and 1993, formula was recalled twenty two times due to safety problems. In 1979 there was a problem with alkalosis caused by a batch of infant formula deficient in chloride. In 1985, deaths of two infants were reported who were diagnosed with aluminum intoxication from powdered formula. In 1986, a factory had to be shut down because persistent salmonella in the powdered milk could not be eliminated. In 1990, gallons of a liquid soy concentrated formula were recalled for contamination when FDA inspectors noticed that the cans were swollen, some ready to burst—indicating potential contamination. Further investigation showed that all the swollen cans were from the same production run.

The manufacturing and the preparation of infant formula is not the only concern. While the composition of breastmilk varies according to the infant's age, infant formulas are standardized with regard to composition and, for this reason, formulas can never acquire breastmilk's nutritional adequacy (Udall and Suskind, 1999). In addition, most commercial formulas contain more protein and more ash content (Na, K, Ca, P and other minerals) compared to breastmilk (Udall and Suskind, 1999); and formula contains the same allergenic proteins as raw untreated cow's milk, which can trigger an allergic reaction, particularly in babies who have a family history of allergies (Riordan and Auerbach, 1998). It is for these reasons that, even in the developed nations, compared to breastfed babies, formula fed babies suffer from increased rates of morbidity and mortality (Cunningham et al., 1991; Beaudry et al., 1996).

d-2) Unmodified animal milk

A substantial body of literature has documented the use of animal milk as a breast milk substitute in sub-Saharan Africa (Almedom, 1991; Hayes et al., 1994; Van Esterik and Elliott, 1986; Thairu, 2002, Darling, 1998; FAO, 1994; Jelliffe, 1968; Maree and Schweizer, 1978). In the sections that follow, I have not reviewed milks such as camel milk and buffalo milk, in part because the compositions of these milks are not well known, and in part because they are not widely used in many parts of the world. Rather, I have chosen to focus the review on the more common animal milks: cow and goat's milk.

d-2-1): cow's milk

Compared to infant formula, one of the major advantages of cow's milk is that it is relatively cheap and, for this reason, substituting formula with cow's milk can result in substantial savings (Yeung and Zlotkin, 2000). Even in developed countries, the cost of whole cow's milk remains significantly lower compared to that of infant

formula. While the lower cost of cow's milk makes it seem an attractive option for replacement feeding, unmodified cow's milk is not ideal for feeding infants especially if it is used to replace either breast milk or formula in the first six months of life (Yeung and Zlotkin, 2000).

Various studies indicate that children fed with whole cow's milk before 6 months of age are more likely to develop iron deficiency anemia compared to exclusively breastfed children (Freeman et al., 1998; Morton et al., 1988; Oti-Boateng et al., 1998; Tunnessen, 1987). Iron deficiency anemia is caused in part by gastrointestinal bleeding resulting from proteins in bovine milk (such as lactoglobulin, casein, bovine serum albumin and lactalbumin) which act as allergens, irritating the infant's immature gastro-intestinal wall and provoking bleeding; and in part by the low iron content and low bioavailability of iron in cow's milk (Riordan and Auerback, 1998). Yeung and Zlotkin (2000), argue that, after 6 months of age, as long as infants who are fed with cow's milk also consume foods that provide an adequate source of iron, iron deficiency anemia is no longer of much concern. Stoltzfus (personal communication), highlights the difficulty for most mothers in sub-Saharan Africa to find iron-rich foods to complement their infant's diet.

Because the composition of unmodified cow's milk differs from that of breastmilk, cow's milk may be less easily digestible, and its nutrient composition may be less well suited to the infant's needs. For example, the amino acids methionine and phenylalanine, which are difficult for the infant to metabolize, are present in higher amounts in cow's milk protein than in breast milk proteins (Smolin and Grosvenor, 2000). Because higher protein content increases fluid needs (protein requires about seven times more water for metabolism than does carbohydrate or fat) and because urea, which is produced from the breakdown of amino acids, requires large amounts of water for excretion in the urine, feeding an infant cow's milk (which is higher in

protein than human milk) that is too concentrated, can increase fluid losses and lead to dehydration (Smolin and Grosvenor, 2000). Further compounding this problem is the mineral content of cow's milk (higher sodium and phosphorous levels) making it less digestible in comparison to breastmilk (Udall and Suskind, 1999). Unmodified cow's milk has lower contents in some important nutrients. In particular, the following micronutrients have all been found in lower concentrations: cholesterol; the essential fatty acid linoleic acid; the long chain polyunsaturated fatty acids (arachidonic acid and docohexanoic acid), which are essential for normal brain development, eyesight, and growth; vitamins A, C and D; and iron (Maree and Schweizer, 1978; Riordan and Auerbach, 1998).

Cow's milk has been implicated in causing allergies in early infancy. As explained by (Maree and Schweizer, 1978) cow's milk may cause allergies in infants for the following reasons: a) infants have an immature gastro-intestinal tract which has limited defenses against food proteins and other antigens, this is partly because their own secretory IgA, which later "paint" the mucosa and bind sensitizing proteins, are not yet functioning effectively, and partly because the IgE system is defective at birth b) infants have an intestinal tract that is more permeable to macromolecules which, if absorbed from the bowel, may trigger a variety of secondary allergic responses (such as eczema, bronchitis, or asthma). The authors explain that cow's milk allergies are not benign, they may predispose the infant to immune-complex diseases which may result in serious damage for the organ in question, they may also be responsible for the development of life-long food allergy. They propose that, because infant formulas are often developed from cow's milk, they may be responsible for many of the same problems (including allergies).

d-2-2): goat's milk

In comparison to cow's milk or even to infant formula, in many parts of the world, goat's milk is not readily available and, for this reason, it tends to be relatively expensive. To illustrate the difference in costs, I compare the costs of different milks in one local grocery in Ithaca, New York, the place from which I wrote this dissertation. Feeding an infant with goat's milk for six months costs almost six times more than using cow's milk, and almost twice as much as infant formula.

There has been relatively little research on the use of goat's milk for infants under six months of age. Some research indicates that, because goat's milk contains low levels of folic acid and vitamin B12, it has been implicated in the development of hyperchromic megaloblastic anemia (Taitz and Wardley, 1985; Maree and Schweizer, 1978). This association was first observed in Europe during the 1920s and 1930s, where children fed with whole goat's milk before 6 months of age often developed hyperchromic megaloblastic anemia (Taitz and Wardley, 1985).

It is unclear whether, like cow's milk, goat's milk causes animal milk allergy in infant. According to a popular infant nutrition resource (Pediatric nutrition consultation online, 2001), because goat's milk contains only amounts of an allergenic casein protein (alpha-si), found in cow's milk, it may be a better substitute than cow's milk, particularly for allergic infants. On the other hand, because goat's milk contains similar levels of beta lactoglobulin (an allergenic protein) compared to cow's milk, it may be argued that goat's milk is just as allergenic. At present, there is no conclusive evidence showing the direction of any association between goat's milk and infant allergy.

Because the symptoms of animal milk allergy are varied and nonspecific (vomiting, diarrhea, colic and bleeding if the milk affects the gastrointestinal tract of allergic infants; runny nose, cough and asthma if it affects the respiratory tract;

dermatitis and urticaria if it affects the skin) the diagnosis is often mistaken or missed (Bahna, 1989). As Riordan and Auerbach (1998) have argued, compared to the use of animal milk, breastmilk facilitates the early maturation of the intestinal barrier. At the same time, until the baby's own natural barriers develop, it constitutes an external barrier to potential allergens through its anti-allergic components. For this reason, exclusively breastfed infants have fewer allergies compared to babies who are fed with animal milk or with infant formula.

4. Best practices for the preparation of other milks for infant consumption

1. Modifying the composition

UNAIDS/UNICEF/WHO guidelines (1998) recommend that infants fed with animal milk be supplemented with the following micronutrients: iron, vitamin A, C and folic acid. The concentrations of these micronutrients have been found to be less than in breastmilk. To reduce the greater concentration in protein, sodium, phosphorous and other salts, UNAIDS recommends diluting with boiled water. However, because dilution reduces the energy concentration, sugar must also be added. To make up 150 ml of home-prepared formula, the agency recommends mixing milk, water and sugar in the following proportions: 100 ml of milk, 50 ml of boiled water and 10g (2 teaspoons) of sugar. This solution should then be boiled.

2. Ensuring hygiene

According to UNAIDS/UNICEF/WHO (1998) guidelines, when preparing other milks for infant consumption, hygiene is absolutely essential, especially because infants have immature immune systems, making them particularly vulnerable to pathogens. Additionally, milk is an ideal breeding ground for bacteria that can cause gastroenteritis, an illness that can be life threatening for infants. For this reason, the introduction of prepared feeds often increases the risk of infection, particularly

diarrhea. The increased risk of infection is related to the greater likelihood of milks being contaminated during mixing and/or being fed from a contaminated bottle or cup.

To ensure adequate hygiene practices when preparing bottles, teats and caps, the agencies recommend that, immediately after each feed, the feeding utensils should be washed thoroughly using detergent and water. The equipment needs to be sterilized after it has been cleaned. The agencies recommend sterilization using boiling for most people in developing countries. To do this: a) caregivers should use a sauce pan that is specifically for sterilizing only the baby's utensils and for no other purpose b) during sterilization, the utensils should be placed in a saucepan, covered with water and brought to a boil c) bottle teats should be boiled for approximately 3 minutes. The agencies advise caregivers to always wash their hands before handling any of the sterilized utensils and, if utensils are not used within 3 hours, to re-sterilized. Ideally, the water used to make up any foods or liquids for the infant should always be boiled until the child is over six-months-old. Storage is also essential: if a day's supply of feeds is made, the feeds must be refrigerated as soon as they are made, leaving the feeds at room temperature would allow the bacteria to quickly multiply.

Given the difficulty of keeping bottles clean, and evidence that bottle feeding may make the baby less eager to suck at the breast, the agencies recommend that prepared formula and breastmilk substitutes be fed with a cup and spoon. Cups and spoons are thought to be easier to clean and, for this reason, to be safer microbiologically than feeding with a bottle and artificial nipple.

5. Mothers' rights to fully informed and free choice of infant feeding method and challenges for the informed approach

In the present situation of incomplete knowledge about the safety of exclusive breastfeeding and solid knowledge about the risks of replacement feeding in environments with poor sanitation and economic constraints, HIV positive women

face difficult choices about how to feed their infants (Latham and Preble 2000). The basic principle of “informed choice” requires that HIV positive women are provided with adequate information about their options reviewed in the section above (United Nations’ Convention on the Rights of the Child 1990). In line with this principle, guidelines prepared jointly by UNAIDS, UNICEF and WHO promote fully informed and free choice of infant feeding methods for HIV positive mothers (UNAIDS 1998). Counseling HIV-infected women should include the best available information on the benefits of breastfeeding, on the risk of HIV transmission through breastfeeding, and on the risks and possible advantages of alternative methods of infant feeding.

In most countries in sub-Saharan Africa, the vast majority of pregnant women are not being tested for HIV, so their status is unknown either to themselves or to the health worker (UNAIDS, 2000). Even when women do get tested, some studies indicate that health care providers do not have accurate information to share with HIV positive mothers (Chopra et al., 2000; Kuhn et al., 1999; NFNC et al., 1999) and may convey a lesser risk for formula feeding than for breastfeeding (Chopra et al., 2000; Kuhn et al., 1999). The importance of accurate information is illustrated by Seidel et al. (2000) in a study in Kwa Zulu Natal, South Africa. In this study, a woman was reported to have said:

“I was never told anything about HIV and breastfeeding. I breastfed my baby for 11 months. If I knew anything, I would not have fed him poison, and maybe my baby would have lived a longer time....”

According to the authors, because of lack of adequate counseling, this woman was assuming that her child had been infected through breastfeeding, whereas the child was more likely to have been infected in-utero or intra-partum.

Considering the complexity of information to be imparted, informed decision making also faces educational challenges related to common misperceptions regarding

HIV/AIDS and mother-to-child transmission of HIV (Coreil et al., 1998). The widespread belief that all babies of HIV positive mothers will be born infected, which has been documented in various studies (Chopra et al., 2000; Coreil et al., 1998; De Paouli et al., 2000; Kuhn et al., 1999; Mukuka et al., 1999; NFNC et al., 1999; Thairu, 2002), needs to be countered with accurate information about the rate of mother-to-child-transmission and current understanding of the risk of transmission through different routes.

According to the principle of informed decision making, women should assume responsibility for infant feeding decisions and bear the consequences of whatever method of infant feeding they choose. However, in reality, a woman's authority to make infant feeding decisions may receive scant respect in some communities (Bassett, 2000; Kuhn et al., 1999). For example, in Zimbabwe, decisions about infant feeding are made by the infant's father, the woman's mother-in-law, and often the woman's own mother (Morrison, 2000). When women are provided with information from their health care providers, an additional challenge is that women may refuse to question this information, in part because they trust their health care providers since they possess requisite knowledge and in part because of paternalistic attitudes held by health care providers in many developing countries (Coreil et al., 1998; Gavin et al., 1999).

Early detection of HIV is also needed to enable mothers to recognize their role in infant feeding decision making (Gavin et al., 1999). Women should receive the information as early as possible, either prior to conception or during prenatal care, to allow sufficient time for reflection and later decision-making (Gavin et al., 1999). The importance of early detection in influencing infant feeding choice is illustrated in a Cape Town study where Kuhn et al. (1999) report that 73 out of 88 HIV positive mothers interviewed were not aware of their HIV status at the time of their child's

birth and only discovered it when their child became ill or because of their own illness. According to the authors, women who knew their HIV status at the time of their child's birth were more likely than others to abstain from any breastfeeding.

Most previous discussion has focused on weighing competing risks of HIV transmission through breastfeeding against risks of increased child morbidity and mortality associated with not breastfeeding (Kuhn et al., 1999). In principle, informed decision-making can only take place when women are provided with individualized, unbiased and accurate information about infant feeding options, and when this information is presented in a way that is compatible with women's belief structures (Thairu, 2002; Thairu et al; 2004). The context within which information is made available is also critical, and, in reality, the constraints may be so great that women cannot make an informed choice. Under these circumstances it is even more important to provide culturally-compatible support for the decision making process, which requires attention to the decision makers themselves and their social context. By learning from those who must make and live with these hard choices, public health workers will be in a better position to offer sound advice (Bassett, 2000).

Part 2. Infant feeding within the context of newborn care

In reviewing the topic of infant feeding within the context of newborn care, it would be instructive to provide background information on the problem of newborn mortality, and on the potential impact of appropriate infant feeding practices for the prevention of newborn deaths.

I. Importance of the problem of neonatal mortality

Although mortality due to HIV transmission through breast milk accounts for only a small proportion of infant deaths, the topic has received significant attention during the past decade. In contrast, the prevention of newborn deaths has only recently been identified as a global public health priority and begun to attract attention

from governments and international agencies (Manandhar et al., 2003). It is generally thought that neonatal deaths are under reported, and their relative invisibility may be a factor that has contributed to an underestimation, by policy makers, of their public health importance (Tamang et al., 2001). Consequently, there has been relatively little research in the area of newborn health and survival, and nutrition of the newborn is no exception. A recent study conducted in a developing country setting showed that (any) breastfeeding can prevent deaths due to neonatal sepsis (Ashraf et al., 1991). The findings of the study draw attention to the importance of focusing nutrition research in this area, particularly because neonatal sepsis one of the major causes of neonatal death. However, the study design (case-control) limits the extent to which firm conclusions can be drawn.

Rutsein (2000) explains that, during the 1990s, there was a continued decrease in infant (less than one year of age) and in child (less than five years of age) mortality in most countries in the developing world. The decline in mortality was most pronounced among children aged 2-4 years, with a less dramatic decline for infants (10.5% vs 4% decrease respectively). Because there was only a 3% decrease in neonatal (defined as the period from birth to the first 28 days of life) mortality, neonatal deaths now account for more than two-thirds of deaths in children under one year of age, and nearly two-fifths of all deaths in children under five years of age.

The World Health Organization (WHO) estimates that, each year, 5 million neonates die during the newborn period, and almost two thirds of these die within the 7 days of life (WHO, 1998). Neonatal mortality is reported as highest in Africa (an estimated 42 deaths per 1000 live births), with some areas reaching as high as 200 deaths per 1000 live births (Save the Children, 2005). Although rates are lower in South Asia, the size of the population in countries such as India, Bangladesh and Pakistan means that the majority of newborn deaths occur there (Costello and Osrin,

2003). Based on a review of the available literature, the World Health Organization (1998) indicates that the most common causes of death during the newborn period, and their relative importance, are as follows: birth asphyxia 21%; pneumonia 19%; neonatal tetanus 14%; birth injuries 11%; congenital abnormalities 11%; prematurity and low birth weight (i.e. a birth weight less than 2500g) 10%; sepsis and meningitis 7%; and diarrhea 1.5%.

2. Potential impact of appropriate infant feeding practices on neonatal mortality

Based on her review of the available evidence, Huffmann (2001), has drawn attention to the implications of the timing and causes of neonatal deaths for the potential impact of breastfeeding interventions on neonatal mortality. She notes that during the first week of life, mortality is primarily related to causes of death associated with poor health of the baby at birth (prematurity, low birth weight and congenital abnormalities) and complications of delivery (cord infections and birth trauma or asphyxia). Babies who are preterm or have a low birth weight are more prone to low body temperature, more likely to succumb to infection, more often need to be resuscitated, and are more difficult to feed. Beyond one week of age, the major direct causes of death in the neonatal period include sepsis, acute respiratory infections, neonatal tetanus, umbilical infection, meningitis and diarrhoea. She concludes that over half of deaths beyond one week of age may be attributed to infections and, when tetanus is eliminated, most of these deaths due to infection may be prevented by breastfeeding.

3. Determinants of neonatal mortality

As reviewed in more detail below, various factors have been identified in connection with neonatal mortality. Infant characteristics include gestational age, birth weight, gender, and twin births. Maternal factors include maternal health and

nutrition, mode of delivery, age and education. At more distal levels, interpersonal relationships between the newborn's mother and her partner, family or health care providers and the physical and organizational settings in which these occur may play an important role in ensuring neonatal survival. As well, structural factors i.e. the legal, political, economic or organizational elements of society are critical.

A. Newborn factors

Apgar scores, birth weight and gestational age are highly correlated with neonatal survival. In combination, the three are a measure of newborn well-being, success of resuscitative efforts, newborn size and newborn maturity (De Hart, 1994). Twins or higher order births account for a disproportionately large percentage of neonatal deaths in all populations (Guo, 1993). In most societies, it has been observed that, compared to females, male infants are more likely to die during the neonatal period (see for example: Naeye, 1971; Shakya and McMurray, 2001). As Wells (2000) notes, the reason for this difference in risk is still unclear. Naeye (1971) who was of the first investigators to examine the issue, suggested that the difference may be due to differences in "disease progression" or to a "biologic disadvantage of being male." In contrast, in a few societies, it has been observed that females are more likely to die compared to males. Messer (1997) proposes that anti-female bias may explain why female infants die at higher rates compared to males in these societies. She proposes that, in these societies, females receive less parental resources—for example, they may be fed less or they may receive less expensive health care when they are sick, or may be purposefully neglected and left to die.

B. Factors related to the mother

The majority of maternal factors associated with early infant mortality are associated with the perinatal period. These problems are the result of poor maternal health, inadequate care during delivery, inappropriate management and poor hygiene

during delivery. If a mother dies during childbirth, her baby will have an even smaller chance of survival.

i) Mother's health

As Shakya and McMurray (2001) have proposed, factors related to maternal health have been strongly associated with neonatal mortality. For example, a shorter preceding birth interval implies that the mother does not have sufficient time to recover her health, which impacts both mother and baby. The baby may be underweight, not only because of a short birth interval, but also because of various social, economic and cultural factors and is therefore more likely die. Maternal illness during pregnancy, including diseases such as night blindness, and maternal malnutrition (as determined by MUAC measured during the second and the third trimesters) have also been associated with an increased risk of newborn mortality (Katz et al., 2003)

ii) Age, parity and number of previous child deaths

Regarding maternal age, various socioeconomic disadvantages and suboptimal health outcomes are associated with adolescent pregnancy, such as insufficient education, limited career and job opportunities and poor conditions for effective parenting (Cowden and Funkhouser, 2001). Women aged 35 and older are also at higher risk for chromosomal abnormalities and other factors associated with higher risks of neonatal mortality.

Clark et al. (2002) have argued that higher parities (four or higher previous live births) and nulliparities carry additional risks for birth outcomes, as they are likely to reflect deviation from normal uterine function. A mother with a higher number of prior losses is also at higher risk of giving birth to a child who does not survive. The authors argue that, in general, high parity can also be seen as a marker for low social status and income. Other authors (Haaga, 1989, Curtis et al., 1993) argue that high

parity is a marker for the effects of births which are too closely spaced, which is known to be deleterious to infant survival.

iii) Prenatal care

A number of randomized, controlled trials have investigated the effect of prenatal care on infant or maternal health (Villar and Bergsjo, 1997). However, these studies have not been adequate to demonstrate a beneficial effect of prenatal care on outcomes such as perinatal mortality or pre-eclampsia (Carroli, 2001). At present, the only conclusive evidence shows that receiving a tetanus toxoid injection during pregnancy may be beneficial for the survival of the newborn (Villar and Bergsjo, 1997).

iv) Mode of delivery and place for delivery

Lack of professional assistance at delivery has been shown to contribute to high neonatal mortality (Nessa et al., 1992; Bhatia and Cleland, 1995). Tetanus is a major consequence of mis-management of home delivery by untrained birth attendants, which contributes to high levels of neonatal mortality in developing countries (Necil et al., 1996; Mustafa, 1996; Nessa et al., 1992; Govindasamy et al., 1993). During delivery, risky behaviors may include delivery on unclean surfaces, cutting the cord with unclean razor blades, tying the cord with dirty ties, and smearing substances such as ash or cow dung on the cord (Nessa et al., 1992).

C. Social and psychological factors that influence newborn survival

i) Mothers' desire for the infant

Ethnographic studies have revealed the importance of mothers' levels of desire for a specific child on the type of care the child receives in the early postnatal period. For example, in an ethnography of motherhood among the Igbo of Nigeria, Emechata (1979) recounts the experience of a mother who chose to give birth to her 9th child

without any help. She reported to the ethnographer that when the baby died at birth she said: "*I am glad that God has seen it fit to take you back.*" She described a feeling of guilt, which was slightly relieved, she said, she checked the sex of the dead child and found that it was a girl. According to the ethnographer, this woman felt guilty because she had not wanted the child, and for this reason, she had not asked for help during delivery. Similar experiences of the neglect of unwanted children have been recorded elsewhere (see for example: Scheper-Hughes, 1992). Thus, depending on how an individual mother perceives the addition of a newborn into her family, especially when the family is already living in abject poverty, she may adopt conscious or unconscious behaviors that constrain the survival of her newborn.

ii) Mother's level of education and socio-economic status

The epidemiological evidence associating maternal education with child mortality is substantial (Caldwell, 1979, 1986, 1994; Hobcroft et al., 1984; Desai and Alva, 1998). As Uchudi (2001) has proposed, the level of formal schooling received by a mother is thought to affect child health in multiple ways, including increasing her intellectual capacities and bargaining skills, giving her a greater sense of authority and self-confidence, and allowing her to assert her views in the household and in the community. Educated mothers tend to have a better understanding of disease and child health, they tend to seek medical attention on time and/or on a regular basis. Formal schooling heightens a mother's ability to make use of health care resources, and it may also provide her with the decision-making autonomy necessary to advocate for her child in the household and in the outside world. As Levine et al. (2004) argue, because schooling leads to a delay in childbearing and, because it often translates into a higher income, educated mothers may have more financial resources available when they become mothers, allowing them to afford better medical care and better nutrition for themselves and their (presumably fewer) infants.

iii) Interpersonal relationships between the mother, the partner, the family and health care providers

Failure to recognize problems in the newborn and to act promptly may be an important determinant of neonatal mortality. Because it is difficult to differentiate serious from minor illnesses in newborns, when newborns are brought to the health care facility, they are likely to be very ill and are more likely to die (WHO, 1998). Recognition and treatment of complications may also be influenced by factors that are both internal and external to the household. For example, as Aubel (2004) and Nachbar et al., (1998) point out, in most settings in the developing nations, grandmothers and traditional birth attendants (TBAs) are critical decision makers during labor and delivery. The authors note that these older women's authority is often highly respected by family members and that, when families are confronted with an emergency situation during labor, delivery or shortly thereafter, husbands and other family members generally rely on the grandmother or on the TBA's judgment and guidance in making decisions. Aubel (2004) notes that, during episodes of newborn illness, these older women may coordinate the health-seeking process at the household level, delegate certain tasks to others (such as asking the husband to purchase drugs), advise on treatment procedures (such as the preparation of medicinal teas), and directly administer other procedures such as massage or feeding.

Nachbar et al. (1998) propose that health care provider attitudes also play an important role in influencing a family's decision to seek care and that, in some settings, families are chastised and mistreated by health care providers, and this may contribute substantially to a family's reluctance to seek routine health care services.

D. The importance of the distal context (structural factors i.e. the economic or organizational elements of society)

The community where the mother resides may affect neonatal survival through multiple pathways. For example, when a government chooses to spend money on programs to combat the major endemic communicable diseases prevalent in the country, to extend health services to the rural areas and to reduce the cost of preventive medical services, these improvements may, in turn, contribute to a decrease in mortality (DaVanzo and Habicht, 1986). This larger context is particularly important in relation to seeking care for ill neonates.

While many of the contextual factors reviewed in the section below affect all family members in poor communities – ranging from infants to the elderly, the vulnerability of newborns, combined with the fact that neonatal problems can progress very rapidly and are often difficult to recognize and interpret, makes them especially susceptible to the negative consequences of problems in health service access and quality. Because of the difficulty of interpreting neonatal problems, the World Health Organization recommends the hospitalization of all sick neonates (1998). However, hospitalization remains inaccessible for many in the developing nations (Darmstadt et al., 2005).

In discussing strategies to promote “safe motherhood” in the community, Nachbar et al. (1998), note that, during pregnancy, labor and in the period following delivery, many of the problems mothers encounter are also applicable to their newborns. The authors state that, at this time “the role of family members becomes paramount ... women have little control over decisions regarding their own wellbeing or that of their newborn.” To paraphrase Nachbar et al. (1998), the following contextual factors pose particular challenges for the hospitalization of ill newborns:

1. Distance or time to services: In many settings, especially in rural areas, facilities capable of handling neonatal complications are located too far away to be accessible. Even when the actual distance to a health facility is minimal, lack of transportation and poor road conditions can considerably lengthen the time needed to make the journey.
2. Availability and cost of transportation: Although public and private vehicles may run during the day, such transportation may operate irregularly or be completely unavailable at night. In communities where private vehicles are available, owners may not understand the gravity of the situation or may have other reasons for denying or delaying transport. Regular transportation costs may be affordable, but if emergencies happen when regular sources of transport are unavailable, alternative arrangements may be costly.
3. Hours of facility operation: Even where well-equipped facilities with trained personnel exist, they may not operate 24-hours a day and, if they do, a trained provider capable of handling obstetric or neonatal complications may not always be available. Women and their families may overcome other obstacles and travel long distances only to find that the facility is closed or that the workers available are poorly trained and are unable to handle the problem.
4. Cost of services: Service costs can be one of the most important barriers to use of routine and emergency services. Even where free or low-cost care is reportedly available, medicines, food, room and board and other incidentals may have to be covered by families, making cost a major barrier to using services.

5. Quality of care: In most developing countries, first level health facilities are usually the closest health care facilities sick children. These facilities are mostly run by clinical officers and nurses (i.e. medical staff who are not physicians). In addition, the clinics do not have beds for admitting patients, and essential drugs and supplies are often not available.

3. Principles of good neonatal care

In addition to benefits for the newborn, improving newborn health and survival is beneficial for women, their families and the community. For example, when women experience fewer neonatal deaths, they are more likely to space their pregnancies, thus contributing to the demographic transition from high to low mortality and fertility (Costello and Osrin, 2003).

With regard to breastfeeding, the first two weeks postpartum have been shown to be particularly critical for establishing appropriate infant feeding practices (Dewey et al., 2003). Many studies show, during the first two weeks, mothers face many difficulties which may cause them to introduce breastmilk substitutes, or to cease breastfeeding altogether (Dewey et al., 2003). Problems encountered during the first two weeks include, but are not limited to: a perception of “insufficient” milk; breast engorgement; the baby’s constant crying and or his refusal to breastfeed (see for example: Hall et al., 2002; McLeod et al., 2002). If these situations are not remedied early on, an inadequate supply of milk can lead to excessive weight loss for the newborn, dehydration, and to serious medical problems (Neifert, 2001).

Evidence suggests that the following practices for the routine care of neonates during and after delivery may go a long way in preventing neonatal death. To paraphrase the Child Health Report (1999), these practices include:

a. Prevent asphyxia by clearing the baby's mouth and nose to initiate breathing

Once the baby's head is delivered, cleaning and, if necessary, suctioning the baby's nose and mouth, can help the baby breathe on its own. If a newborn does not cry after initial stimulation by drying, birth asphyxia must be assessed and, if necessary, active resuscitation initiated. This may be done using a self-inflating bag and a mask using additional oxygen. If no equipment is available, mouth-to-mouth ventilation can be effective for initiating breathing in newborns with mild and moderate asphyxia.

b. Preventing and or managing neonatal hypothermia and hyperthermia

i. Drying, warming and cleaning procedures:

Because of low amounts of body fat, newborn babies—especially those born at low birth weight—lose more heat per unit body weight than adults, and are at a high risk of hypothermia. Hypothermia is considered a major contributor to the risk of neonatal mortality, and it clearly impairs the baby's chance of survival in the first week of life. Even in tropical climates, temperatures sometimes drop rapidly, and this may endanger the newborn's life. It is for this reason newborns need to be kept dry and warm and that the room where the birth occurs should be at least as warm as 25C (77F). In addition, the newborn should be dried immediately and covered after delivery and before the cord is cut.

ii. Keeping mother and baby together

Because newborns are not able to regulate their own body temperature well, skin-to-skin with the mother is the best way of keeping newborns warm. Keeping the mother and the baby together also allows early initiation of breastmilk, which is beneficial for heat production dependent on fat metabolism and, consequently, for preventing hypothermia. Suckling may also increase body temperature. For these reasons,

breastfeeding should start within two hours of delivery to provide the baby with calories to produce body heat.

c. Prevention of newborn infections (tetanus and sepsis) by ensuring clean delivery and clean cord care.

Throughout labor and delivery, and until the separation of the cord stump, cleanliness is essential for the prevention of newborn infections. Principles of cleanliness at birth include: clean hands; clean perineum; nothing unclean should be introduced into the vagina; clean delivery surface; cleanliness in cutting the umbilical cord; cleanliness in cord care of the newborn baby. If an infant's umbilical cord is cut with dirty instruments, or if it is not kept clean, dry and free of any substances, the newborn risks tetanus and other infections. As with other periods during the first six months of the infant's life, breastfeeding the newborn exclusively also protects the newborn against orally introduced pathogens.

d. Prevention of hypoglycemia: the importance feeding

Prolonged fasting of newborn babies is associated with a progressive fall in mean blood glucose and may lead to hypoglycemic brain damage. Because hypoglycemia is most likely to occur in the first 24 hours after birth as the baby adapts to being outside the uterus, early initiation of breastfeeding can be an important preventive measure (WHO, 1998).

e. Provision of immunizations

All mothers should be immunized with at least two doses of tetanus toxoid to protect both themselves and their newborns. Where there is a high risk of tuberculosis infection, BCG immunization should be given to infants soon after birth. A single dose of polio should be given at birth or within the first two weeks of life, and where perinatal transmission of hepatitis B is frequent, the first dose of hepatitis B vaccine should be given as soon as possible after birth.

f. Prevention and management of ophthalmia neonatorum

Ophthalmia neonatorum is defined as any inflammation of the conjunctiva (the mucous membrane that lines the inner surface of the eyelid and continues over the forefront of the eyeball) with discharge occurring during the first two weeks of life. The problem is often caused by maternal gonorrhoea or chlamydia. Both eyelids often become swollen and red with purulent discharge and corneal damage may develop if there is no treatment or if there is delay in treatment. Eye prophylaxis involves cleaning the eyes immediately after birth and applying silver nitrate drops, tetracycline or erythromycin ointment within the first hour of birth.

g. Management of newborn illness

Another essential component of care during the neonatal period involves prompt recognition and treatment of newborn illnesses (such as sepsis) when these occur (Nachbar et al., 1998; WHO, 1998). Because most women in developing nations deliver at home, and most life-threatening complications happen at or around the time of birth, survival often depends on the ability of families to i) recognize a problem, ii) perceive it as being serious, iii) decide to seek care and iv) obtain care from a health facility capable of handling obstetric emergencies (WHO, 1998). As the World Health Organization (1998) has highlighted, newborn problems can progress very quickly, making prompt recognition of problems and rapid hospitalization of newborns suspected to be ill an important component of care.

4. Interventions to lower neonatal mortality

The World Health Organization guidelines for essential newborn care (outlined above) encompass cleanliness, thermal protection, initiation of breathing, early and exclusive breastfeeding, eye care, immunization, and management of illness (WHO, 1996). For an individual mother and her family, this means preparing for birth, choosing a safe place for delivery, keeping the delivery process clean, avoiding cool temperatures,

breastfeeding early and exclusively, and understanding (and reacting to) potential danger signs (Manandhar et al., 2003).

Supporting families to adopt essential newborn care practices requires changes at several levels, from policy changes through health services to household and individual behaviors. The following discussion highlights a number of interventions that have been undertaken in developing countries to improve care of the newborn.

a. Interventions to improve infant feeding practices during the newborn period

As argued by Lutter (2000), the first week and month postpartum are critical periods when mothers are likely to introduce non-breastmilk liquids. If women are exclusively breastfeeding through this critical period, they are likely to continue to exclusively breastfeed. Lutter emphasizes that programmatic activities need to be targeted to this early neonatal period to prevent an early shift from exclusive to partial breastfeeding, primarily because it is the period when the impact of an intervention is likely to be greatest.

In 1992, the World Health Organization proposed an initiative designed to guide institutions such as hospitals and maternity centers to encourage exclusive breastfeeding immediately after women give birth (WHO, 1998). This is commonly referred to as the Baby Friendly Hospital Initiative. Based on various criteria, including the “ten steps to successful breastfeeding” the Baby Friendly Hospital Initiative designates institutions as being “baby friendly.” To paraphrase the World Health Organization (1998) the “Ten Steps” require 1) the provision of a breastfeeding policy that is routinely communicated to all health care staff; 2) the training of health care workers to implement the policy defined in step 1; 3) informing all pregnant women about the benefits of breastfeeding, and about the management of breastfeeding 4) helping mothers initiate breast-feeding within a half-hour of birth; 5)

showing mothers how to breastfeed, even in the event that they are separated from their infants; 6) newborns not to be provided with any food and drink other than breast milk, unless medically indicated; 7) allowing mothers and their newborns to sleep in the same room and to remain together 24 hours a day (which is also referred to as “rooming in”); 8) encouraging mothers to breastfeed on demand; 9) avoiding artificial teats or pacifiers for breast-feeding infants; 10) encouraging the establishment of breastfeeding support groups and refer mothers to these when the mothers are discharged from the facility (for example the La Leche League).

Various studies have found that the Ten Steps are consistently associated with an increase in the duration of exclusive breastfeeding, especially in the first few weeks postpartum (World Health Organization, 1998). However, as some authors have argued, hospital-based interventions such as the Ten Steps only affect the women who deliver in hospitals, requiring other means for reaching and supporting women who have little or no contact with hospitals (see for example: Perez-Escamilla et al., 1993; Bryant, 1982). As Green (1999) and Morrow et al., (1999) have argued, there is growing evidence to show the positive impact of community-based approaches in increasing the rates of exclusive breastfeeding during the first months of life. These community based approaches include home visits by knowledgeable workers, “peer counseling” programs in the community, counseling within health centers after mothers have been discharged, and the use of the mass media.

To this author’s view, while most hospital based approaches (such as the Ten Steps) focus on the period from birth to discharge (which can be as little as 24 hours after birth), and while community based approaches focus on the first six months of the infant’s life, there have been very few interventions that have focused on feeding exclusively during the critical neonatal period (0-28 days).

b. Other interventions (apart from breastfeeding) to improve newborn health and survival

a. Hospital based interventions

To date there have been relatively few interventions in developing countries aimed specifically at improving newborn health and survival. The few evaluation reports that are available suggest that substantial benefits could be obtained from simple, low-cost activities. For example, in a brief report, Lincetto et al. (2000) describe a 6 month intervention conducted in one public hospital in Mozambique. According to the authors, neonates represented 20% of all hospital admissions, and about one half of the neonates who were admitted survived. As 80% of the deaths occurred in low-birth weight (LBW) infants, the intervention was designed to address the needs of LBW using the Kangaroo care approach proposed by the World Health Organization for LBWs (WHO, 2003). Briefly, the intervention was composed of the following components:

1. A ward was equipped with a radiant heater, a table, tap water, soap and towels, a bag, mask, oxygen, a phototherapy lamp, a neonatal scale and feeding tubes;
2. Kangaroo care was offered for all infants under 1800g, irrespective of their gestational age;
3. Mothers were taught to keep the baby skin-to-skin on her chest day and night, dressed only in diaper, cap and socks, and covered with the traditional cloth most women use in Mozambique;
4. Newborn temperature was assessed every 12 hours;
5. Breastfeeding was promoted;
6. All infants with respiratory infections were given antibiotics

7. Newborns were discharged when their weight had reached at least 1500g or had steadily increased.

Compared with the same quarter of the previous year, the authors found that overall, survival improved from 50 to 61% with the same percentage of low birth weights.

The authors identified three major barriers to the successful implementation of the project:

1. Resistance to change at the institutional level and a belief among health workers that only more sophisticated equipment would lead to improved neonatal health and survival;
2. Cultural beliefs such as a lack of acceptance of low birth weight infants who were believed to be “ugly” and “not normal”; or the belief that colostrum is “dirty” and should therefore be discarded and;
3. Nurses’ perception that the intervention increased their already heavy work load.

Further research is needed to find out whether similar interventions could be effective in other hospital settings in the developing nations.

b. Improving home care of the newborn

According to Bang et al. (2004), for most neonates in developing countries, where 96% of the global burden of neonatal deaths occurs, appropriate neonatal care is practically non-existent. Echoing previous authors (such as Nachbar et al., 1998) Bang et al. note that although the standard advice is to admit every ill neonate to hospital, hospitals with facilities for neonatal care are often inaccessible for rural populations and that, because of serious difficulties in transporting sick neonates to hospitals, those who arrive at the hospital tend to be seriously ill. In addition to practical difficulties, the authors propose that parents may also be unwilling to move

ill neonates from the home because of traditional beliefs related to the postpartum seclusion of the mother and the newborn during the first month or so following birth. For these reasons, the authors propose that, to reduce neonatal mortality in the developing countries, ways to provide appropriate neonatal care at home must be developed. The authors draw their conclusions and arguments from their experience in rural India where they have conducted a long-term, community based intervention to improve neonatal health and survival. As described in Bang et al. (1999), this community-based intervention had the following key features:

- a. An exploratory survey of neonatal care at home was used to plan the health education that would inform mothers and grandmothers about care of pregnant women and of neonates;
- b. Additional exploratory work identified sepsis as being the most common cause of death, for this reason, early detection and treatment of sepsis became the main focus of the home-based neonatal care intervention;
- c. In the intervention village, women with 10 years of school education who were willing to work were chosen as village health workers;
- d. The female workers were trained in home-based management of neonatal illnesses and were issued with a care kit containing items such as a flip chart for health education, soap, a brush for cleaning nails and hands, cotton, antibiotics, vitamin K and a tube and mask for resuscitation;
- e. They were also trained to diagnose common neonatal problems such as birth asphyxia, to weigh babies, and to assess hypothermia;

- f. No female village health workers were chosen in the control village;
- g. The workers began by listing pregnant women in the village. They then collected data by home visits in the third trimester, observed labor and neonates at birth, visited the home regularly until 28 days after birth to examine mother and newborn, weigh the newborn, and manage minor newborn illnesses;
- h. To prevent hypothermia, mothers were encouraged to keep the room warm in the winter, to dry the baby immediately after birth and to cover him using a warm cloth, a head cover and baby clothes. Mothers were also advised to wrap the baby in a blanket during the winter;
- i. Mothers were encouraged to start breast feeding in the first hour after birth and continue exclusive breastfeeding on demand;
- j. To prevent superficial infections, traditional birth attendants were encouraged to wash their hands, to cut the cord with a clean blade, tie it with clean thread and apply gentian violet to the umbilical stump;
- k. The trial did not provide any referral care to neonates—apart from that already available at government hospitals—however, families were free to seek care from any other sources as they saw fit.

The authors found that this community based intervention significantly improved neonatal health and survival in the intervention village. Compared to the control village, the rates of neonatal mortality were 17% lower in the intervention village. In the intervention village, the decrease in case fatality due to neonatal sepsis

was almost 6 fold. The authors estimated that it cost only 5 US dollars to avert each neonatal death.

Fikree et al. (2005) and Osrin et al. (2005) suggest that, as a prerequisite to the design of effective interventions, we first need to identify and understand current newborn care-giving practices and their underlying rationales. In this author's view, the identification of effective interventions would, ideally, lead to the development of evidence-based policies. However, at this time, it appears that public health and nutrition understanding of what happens at home and how to change newborn care-giving behaviors remains limited. Therefore, in the future, in addition to efforts to increase the knowledge base about home care practices of the newborn, the information should be collected with the perspective of designing interventions and, if the interventions thus developed are found to be effective, to propose appropriate policies based on the evidence.

Conclusion

In this chapter, I have discussed infant feeding within the context of two special circumstances: a) infant feeding and mother-to-child transmission of HIV and b) infant feeding in relation to appropriate care of the newborn. I have reviewed the major factors that contribute to mother-to-child transmission of HIV through breastmilk as well as the infant feeding options available to HIV positive mothers who breastfeed. I have also reviewed the factors that affect neonatal survival, and highlighted the particular role of infant feeding within this context, including the prevention of hypothermia, hypoglycemia and infections. I have also provided some illustrative examples of interventions that have been conducted to prevent neonatal mortality. In the chapter that follows, I describe the theoretical and methodological approaches that were used to investigate infant feeding in the three studies reported in this dissertation.

CHAPTER 4

METHODOLOGICAL APPROACHES

In nutrition, bringing social science perspectives to bear has been essential for understanding the social and cultural factors that affect nutritional outcomes and conditions. Increasingly, the significance of these factors for infant and young child nutrition has become recognized within nutrition and public health communities. In this chapter, I review some features of social research techniques and theories, with an emphasis on the approaches I used to investigate beliefs and practices related to infant feeding within the contexts of HIV and neonatal care. In particular, I discuss the focused ethnographic approach, and the “Trial of Improved Practices” approach.

A) The ethnographic approach

Ethnographic research methods have been used by anthropologists and other social scientists for more than a century (Pelto and Pelto, 1978). Ethnography is not a single research method, and the term does not define a single strategy of data collection, or a strategy of data analysis (Atkinson and Pugley, 2005). Rather, it is a general approach to the exploration and understanding of social settings and social processes. Ethnographic research has several sources and inspirations, the principals of which are social anthropology, community studies and sociology.

As Pelto and Pelto (1978) have argued, throughout most of the 20th century, the vast majority of ethnographic studies were conducted over many months of fieldwork by anthropologists who went out to study cultures that were very different from their own. Typically the communities that were selected for study were small-scale societies where much of the social interaction was face-to-face. In order to acquire cultural knowledge and everyday practices, and learn to see and understand the world from the perspective of an insider, the ethnographer attempted to create a role for him or herself in the community as a non-judgmental, socially acceptable but

naïve cultural novice. This was relatively easy when research was conducted in cultures that were very different in orientation and organization from the ethnographer's own culture (usually Western European or Euro-American). However, more recently, as ethnographers have begun to study their own culture, they have found that they need to develop additional techniques to overcome the human tendency to inject their own tacit cultural assumptions into their data collection and analysis.

1) Key features of the ethnographic approach

At the most elementary level, “describing a culture” necessitates discovering shared patterns of behavior and thought that give some coherence to the topic of interest (Rohner, 1984). Thus, ethnography is an attempt to detect common patterns within a culture, while recognizing that this does not rule out variation within the culture (Schweizer, 1998). But ethnographic research goes further than merely describing. It seeks to provide an in-depth understanding of why people do what they do. Through understanding the reasons for people's behaviors, such as identifying the obstacles people encounter in seeking health care, ethnographic research provides planners with information that allows them to adapt programs to cultural conditions.

Another key feature of ethnographic research is that it attempts to understand human beliefs and behavior from the point of view of the people being studied. In the mid 1950s the anthropological linguist, Pike (1967) proposed the use of the term *emic* to describe analyses that attempt to capture and represent the perspective of the cultural insider and the term *etic* to refer to the perspective of the external, scientific analyst.

Ethnographic research is also characterized by a flexible and iterative approach as follows: a) hypotheses are continually developed, tested, and redefined through a series of feedback loops during data collection; b) analysis is ongoing during the

process of data collection, allowing identification of areas that need further investigation while still in the field as well as the elimination of false leads or unproductive areas of research and; c) methods are usually adapted as needed and new methods may be developed to address specific questions. As such, during ethnographic research, interview schedules are continuously revised during the research project and new factors identified in early interviews can be followed up in later interviews. Bentley et al. (1999) note that one consequence of this iterative and flexible approach, in which new questions are asked throughout the course of data collection, is that the same information is not available for every individual who has been interviewed and that this, in turn, presents some challenges for quantifying ethnographic data.

As summarized by Atkinson and Pugley (2005), the following guiding principles are applicable to the broad range of ethnographic work:

- a) Meaning: Ethnographic research is based on the principle that social life is meaningful. Social actors—i.e. the individuals in the particular cultural framework being studied—engage with one another and with the world about them in the light of their interpretations and understandings of actions, objects and communications. Social actors are knowledgeable, and they are thoroughly socialized into their own culture. They have a wide repertoire of social competencies and skills which are often tacit knowledge that is not explicitly taught. Social actors are not consciously aware of the rules, conventions and stocks of knowledge that they use and draw on in everyday life;
- b) Process: Social life is not a matter of fixed entities and structures. Identities are also changeable, while meanings are always available to negotiation and redefinition;

- c) Context: Social actions and social identities make sense in context. Phenomena cannot be analyzed divorced from their social and cultural contexts. Analysts have to pay close attention, therefore, to local cultures and subcultures;
- d) The everyday world: Contrary to common misconceptions, the ethnographic exploration of a social setting is not devoted to an examination of the unusual, the exotic, the overtly dramatic or the *outré*. Rather, it is concerned primarily with the ordinary, mundane reality of everyday social life, addressing routine activities conducted by ordinary social actors.

2. Ethnographic methods and techniques

Ethnographic fieldwork is not confined to any single mode of data collection. Participant observation is a defining feature of ethnography, but it is not the only method (Atkinson and Pugley, 2005). Most ethnographic studies use several ethnographic tools to develop an in-depth understanding of the topic under investigation. This is a form of *triangulation*, in which several methods give the same results, thus ensuring the validity of qualitative data (Patton, 1990). In addition to participant observation, common ethnographic techniques include: key informant interviewing; structured interviews and surveys; and formal cognitive mapping techniques, such as free listing and pile sorting. These techniques are briefly described in the section that follows.

a. Participant observation

Ethnographers develop their cultural learning through participant observation (Atkinson and Pugley, 2005). This means that the researcher learns about the social world through direct engagement with it. As Pelto and Pelto (1978) emphasize, the ethnographic fieldworker should totally immerse himself in the lives of the people; and that can only be done through long periods of residence in the local community.

This ensures that the ethnographer observes details of daily life and activity enacted by people who have become relatively indifferent to, and unabashed by, the presence of a “foreigner” allowing the ethnographer to see elements of daily life repeated over and over again; until they become common place. As many of the habits and concerns of the local people are internalized, part of the ethnographer’s knowledge becomes embedded in his or her own daily routines.

As discussed in the section on “Focused Ethnography,” previously, the long time periods required for field work precluded the use of ethnography in public health and nutrition (Scrimshaw and Hurtado 1987; Herman and Bentley 1992, Gove and Pelto, 1994, Manderson 1996). As Manderson (1998) explains, increasingly, anthropologists needed to develop “rapid” or “focused” techniques which were less costly and less time consuming. She notes, however that, due to the brevity of fieldwork and the lack of prolonged participant observation, these techniques result in the loss of a lot contextual information, and possibly to an “oversimplification” of behavior.

In addition to “immersing” oneself in the culture, Pelto and Pelto (1978) emphasize that participant observation requires more than simply “being there” and “passively watching what people are about.” A well conducted participant observation exercise requires the ethnographer to find out more about the behavior or event than can be observed first hand. The ethnographer also needs to find out whether the event is representative and to record it as accurately as possible, during or immediately after it occurs. In general, however, the relatively unstructured information obtained through participant observation is basic to other more refined ethnographic techniques. These preliminary observations provide the ethnographer with insights and clues necessary for developing interview questions, or other more

specialized research tools. Participant observation may allow the evaluation of other ethnographic data gathered by the specialized techniques.

b) Key informant interviewing

As Rohner (1984) has argued, there is a lot of variability across individuals with regard to their knowledge and interpretations of their own social and cultural systems. The richness of people's vocabulary, their knowledge, their willingness as and their capability for verbally expressing cultural information differs. Consequently, the ethnographer usually finds that only a small number of individuals in any community are good "key informants."

Atkinson and Pugley (2005) note that there is a substantial difference between interviews conducted with key informants in comparison to surveys. Key informant interviews are often conversational—both in tone and structure—and questions are not posed in a predetermined order, nor are they necessarily couched in standardized formats. Sometimes, in the context of sustained ethnographic fieldwork, key informant interviews may be all but indistinguishable from spontaneous conversations.

Pelto and Pelto (1978) note that "key informants" have been valuable sources of information about their cultures, and have been indispensable for recovering information about ways of living that have ceased to exist, or have been sharply modified by the time the ethnographer arrived on the scene. However, the authors caution the exclusive use of key informant interviewing, noting that different interviewers can elicit different kinds of answers from the same informants. They explain that the social characteristics, the style of presentation and other qualities of the interviewer have important effects on the persons interviewed, making the interaction between an interviewer and his/her informants a complex social process. The authors suggest that, for this reason, key informant interviewing is used to best

advantage when it is closely integrated with other methods of ethnographic data collection, particularly techniques that are often referred to as “cognitive mapping.”

c) Free listing

One technique for identifying the cognitive content of a particular social or behavioral domain is to ask individuals to list items or categories (e.g. things, events, places and actions). For example, with respect to illness, one can ask a respondent to list all the kinds of illnesses that a child can suffer from. In addition to producing a working inventory of names and categories, “free listing” can also be considered an exploration of the ways in which people organize information (Pelto and Pelto, 1978). Presumably, the order in which items are mentioned reflects the salience or the importance of those items, highly salient items occur early in the list, while those of lesser significance are likely to be mentioned later.

d) Pile sorting

All of the special methods described so far require reactions to verbal cues, usually with verbal output. Ethnographers have always been alert to the ways in which physical materials or pictures of them, can be used to make interviewing more realistic and often more interesting for informants (Pelto and Pelto, 1978). Pile sorting can be used to explore the relationship among terms and concepts or among physical materials (or their visual representations). The choice of using the physical materials themselves, pictures, drawings or terms and concepts described in short written descriptions, depends on the research topic, as well as on the level of literacy of the participants. For example, to understand the ways in which people in a particular culture organize the domain of color, it is relatively easy to use cards of different colors to make interviewing more realistic for informants who cannot read. To obtain an ethnographic cognitive map of “fish,” one can choose to use pictorial representations of different fish. In an ethnography of “kinship relations” it may be

more appropriate to write words such as “mother” and “father” on a card and to use these as stimuli. Unfortunately, given the uneven distribution of literacy in many populations in the developing world, relying on written materials for pile sorting inevitably results in a biased sample of respondents.

As explained by Borgatti (1996) the pile-sorting technique as being based on the notion of “categorization.” The data obtained from a pile sort allow us to answer the following types of questions: *“Are x and y seen as more closely associated with each other than w and z are? What local explanations are provided for these relationships?”* Borgatti (1996) notes that pile sorting is concerned with discovering “cognitive category structures” which fit a set of objects or events.

Anderberg (1973) explains that we tend to “group” the people, objects and events we encounter into categories, simply because it would be too much for us to mentally process each one of them as a unique entity. In other words, we tend to describe each new object, event or person primarily in terms of their membership in a given category. For example, we describe people in terms of their religion, political attitude, type of employment and so forth. As various authors have proposed (Humphrey, 1980; Quinn and Eimas, 1987; Mervis and Pani, 1980; Mervis and Rosch, 1981) through this cognitive categorization, we can, on average, respond consistently to new members of a category based upon prior knowledge of that category. The authors note that members of the same category can be distinguished from each other, but, because they share similar characteristics, we treat them in a similar fashion. It is for this reason that the degree of “natural association” is high among members of the same group, and low between members of different groups. The authors argue that, although this simplification results in some loss of information, the value of predicting the characteristics of a particular object based on prior experience with members of that category would have been adaptive for our survival as humans.

Borrowing from the field of combinatorial mathematics (and not permutations since the order in which the objects are presented is not important) Anderberg (1973) explains that the number of ways of sorting n distinct objects into exactly k non-empty groups where $n>k$ is a Stirling number of the second kind. This number can be computed from the following sum:

$$S(n, k) = \frac{1}{k!} \sum_{i=0}^{k-1} (-1)^i \binom{k}{i} (k-i)^n,$$

Where n is the number of objects, and k is the number of non-empty groups. For even the relatively tiny problem of sorting 34 practices into 4 groups (encountered in the study reported in chapter 6 of this dissertation), the number of possibilities $S(n, k)$ is extremely large, making it highly inefficient to examine each one of these alternatives individually:

$$S(n, k) = S(34, 4) = 1/4! [-4 + 6(2^{34}) - 4(3^{34}) + (4^{34})] = 1.2295*10^{20}.$$

The human capacity to simplify information by creating categories makes an investigation of all these alternatives virtually useless. To illustrate how humans create categories, Andeberg (1973), provides the example of going to the grocery store and buying food for a family of four as follows:

“The purchases will likely fill two carts, and involve several hundred distinct pieces. Putting all these items into bags for the trip home may be viewed as a pile sorting problem in which each grouping is limited in size to the capacity of the bags. The most desirable arrangement is not obvious, and the number of groupings will not be known until the last item is bagged. The number of possible

arrangements is enormous. But one can reasonably reject many of the arrangements as uninteresting. For example, an arrangement in which the milk is put on top of the bread, or one in which the cans are put on top of the fresh produce is likely to be rejected. A little thought might suggest putting the meat and the poultry together in one bag, the frozen foods in another, the cans in a third category and so forth; or a wholly different scheme may come to mind...in such a case, the human mind would generate a series of short cuts that would allow a reasonable arrangement in little more time than it would take to stuff everything into bags in total disregard for the similarity or the compatibility among the items. It is generally the intent ...to emulate such human efficiency and to find an acceptable solution while considering only a small number of the alternatives.”

With regard to interpreting the pile sort results obtained, Anderberg notes that, before conducting the grouping exercises, the researcher does not know anything much about the “structure” of the categories. But by the time the researcher begins to analyze the results, s/he should be sufficiently well informed about the problem, such that he can “distinguish between “good” and “bad” groupings when these occur.

e) Structured ethnographic interviews and surveys

While participant observation and key informant interviewing have generally formed the core of ethnographic research, when used exclusively, they are subject to serious methodological weaknesses. In particular, as argued by Kroeger (1983), when the frequency and the distribution of specific beliefs and practices are not appropriately quantified, there is the risk of stressing only the exotic and conspicuous events. The author notes that other methodological criticisms of unstructured ethnographic techniques include a lack of specification of the population from which

informants are drawn; lack of specificity of research procedures; and a focus on vivid, personalized reports that are difficult to compare with other ethnographies.

Elsewhere, much has been written concerning the design, administration and processing of interview schedules. It will be sufficient here, therefore to highlight key features of the ethnographic survey. In constructing ethnographic interview schedules or survey formats, ethnographers usually draw from their previous observations as participants and/or from preliminary key informant interviews in order to identify significant questions for structured interviewing; initial data gathering also allows the ethnographer to establish appropriate terminology (Pelto and Pelto, 1978).

3) Analysis of ethnographic data

According to Bernard and Ryan (2000), most of the data recording human thought and behavior is often text of one kind or another. Bernard and Ryan note that, previously, the sheer volume and the problems of manually handling and sorting through text data generally made text analysis less popular. More recently, the grounded approach (described below) has been the inspiration for several of the most widely used software packages in text analysis, including Atlas-ti (Muhr, 1991) and NUDIST (Non-numerical Unstructured Data Indexing Searching and Theorising, QSR, 2002). The presence of software programs that help researchers code and manage text data has made it possible to manage and code large amounts of text, and has facilitated the analysis of text data collected with ethnographic techniques. In addition to coding and retrieving text, some of the software contains features that help with building conceptual models, linking concepts to networks, doing word counts and conducting other types of analysis (Bernard and Ryan, 2000).

While software programs are useful for managing and coding large amounts of text, and while they make it easy to compare responses to the specific questions, as with content analysis (also described below), this analytic approach fails to capture the

context of the statements, which is important for understanding their meaning. After coding, an analyst needs to turn to a different type of analysis in which s/he searches for themes that appear in more than one interview (Thairu et al., 2005). Thematic analysis (described below), depends on the analyst's theoretical orientation and on the research topic at hand, many thematic approaches can be used. Some investigators seek to identify "cultural models" or "schemes." Some focus on specific theoretical issues, such as evidence of social conflict; cultural contradictions; methods that people use to manage social relationships or information about how people solve problems.

a) Analysis of text data using content analysis and thematic analysis

During the past few decades, qualitative research has greatly benefited from theoretical and methodological developments in data analysis (see for example: Bernard and Ryan 1998; LeCompte and Schensul, 1999). Analyses typically fall into one of two categories: content or thematic analysis. Content analysis is a relatively simple approach in which the researcher determines the frequency of particular words or phrases in a body of original text data to identify keywords or repeated ideas. In addition to simple word counts, content analysis can be expanded to include associated attributes of keywords, such as synonyms, location in the text, and surrounding words or phrases (Dey, 1993).

Content analysis techniques are valued for their efficiency and reliability. With appropriate software, large numbers of text files can be quickly scanned and keywords tallied. And since the original, "raw" data are used, there is little interpretation involved in the word counts, resulting in greater reliability. The primary drawback to content analysis is that context is not considered for the keywords searched, limiting the richness of the summary data produced.

In contrast to content analysis, thematic analysis moves beyond standard coding of explicit words or phrases, and focuses on identifying and describing both

implicit and explicit ideas, making this analysis more involved and nuanced. Codes are developed for ideas or themes and are then applied or linked to raw data as summary markers for later analysis, which may include comparing the relative frequencies of themes or topics within a data set.

In this dissertation the “cultural models” approach described by Holland and Quinn (1987) proved to be an excellent framework for the thematic analysis of text data and was particularly useful for describing shared meaning among people in the communities where the research was conducted. A “cultural model” is the shared meaning system of a social group: the model involves the group’s shared explicit and implicit knowledge, interests, beliefs and values. A description of a cultural model not only reflects how people label and describe their world, it also captures the emotional and motivation aspects of experience (Strauss and Quinn, 1997). In other words, cultural models frame experience, supply interpretations of that experience and provide goals for action (Holland and Quinn, 1987). Cultural models are “kept” in individual minds, and they generate much of each individual’s knowledge. However, sharing is what makes these models truly cultural as opposed to idiosyncratic (Dressler and Bindon, 2000).

For the construction of a cultural model, technically, any respondent can be selected as the starting point. Themes identified from this respondent’s interview are then considered as the “initial cultural model,” which is then confirmed, modified, and expanded, based on a comparison with the other interviews. From the perspective of normative description, the process is stopped when no new information is added by the addition of another respondent. For each theme, the context of the statement and characteristics of the respondent are noted in order to build a fuller description. For all three studies reported in this dissertation, findings are presented here in terms of these themes as they relate to the women’s beliefs and perceptions about infant feeding

during the first six months of life. In the three studies, the cultural models developed using the text analysis will essentially be a description of the shared beliefs and knowledge about feeding during early infancy.

b) Developing “codes” and “themes” the importance of the grounded approach

The “grounded” approach emphasizes the discovery and the labeling of concepts and the building of models based on a close reading of the text. Rather than using his/her own preconceived codes as the starting point, the “grounded” analyst develops codes as s/he reads through the text. As described by Bernard and Ryan (1998), the grounded approach is a set of techniques that a) brings the researcher close to informants’ experiences and b) provides a rigorous and detailed method for identifying categories and concepts that emerge from the text. A key feature of the approach is that it is an iterative process by which the analyst becomes more and more “grounded” in the data. The mechanics of the grounded approach are as follows:

- Produce verbatim transcripts of interviews and read through all samples of text, usually line by line
- Identify the categories and terms used by informants themselves to “label” and, consequently, to allow easy retrieval of the data, this is called “*in vivo*” coding
- Identify potential themes that arise, this is often done using general themes derived from reading the literature and adding more themes and sub-themes as the analyst goes along
- As analytic categories emerge, pull all the data from those categories together and compare them, considering not only what text belongs in each emerging category, but also how the categories are linked together
- Use the relationships among categories to build “models,” constantly checking the models against the data

- Throughout the process, keep running notes about potential new “hypotheses” and new directions, developing increasingly richer concepts and models of how the phenomenon being studied really works.

In this dissertation, the “grounded approach” was used to develop the themes identified. In other words, as a researcher, rather than bring my own preconceived framework to analyze and interpret the data, I depended on a “close reading” of the text to develop appropriate codes and themes that were based on the interview transcripts.

c) Analysis of pile-sort data using multi-dimensional scaling

There are various techniques for analyzing pile sort data, of which the most common include hierarchical clustering and Multidimensional Scaling (MDS). Here, I describe the general procedures for the MDS technique which was used to analyze pile sort data in this dissertation.

As described by Schiffman et al. (1981): “MDS is a powerful mathematical procedure which can systematize data by representing the similarities of objects spatially as in a map (Presenting someone with a map of the United States and asking the person to measure with a ruler the distances among a number of diversely located American cities is a straightforward project. MDS does the opposite of this; it takes a set of distances (such as those found in a table at the bottom of maps) and recreates the map. All that is needed to apply MDS procedures is set of numbers that expresses all (or most) combinations of pairs of similarities within a group of objects.” When rank orders, rather than distances, are used to obtain a geometric representation, the process is called non metric MDS. Where the actual distances are used, the process is called metric MDS (Johnson and Wichern, 2002).

Schiffman et al. (1981) note that “*MDS procedures represent the objects that are judged as similar to one another as points that are close to*

each other in the resulting spatial map. Likewise, objects which are judged to be dissimilar are represented as points that are distant from one another in the map.”

The example I provide below is a classic example of “metric MDS” inspired by Schiffman et al.’s description. I pulled out a set of distances among 5 American cities from a regular map (Rand McNally, 2005). I chose to use Boston, New York City, Washington DC, San Francisco and Seattle as those are the five major American cities I have visited. The distances between these major cities are outlined in table 3.1.

Table 3.1 Set of distances among 5 American cities

Distance in miles	Boston	New York City	Washington DC	San Francisco	Seattle
Boston	0	211	442	3140	3088
New York City	211	0	237	2946	2894
Washington DC	442	237	0	2840	2788
San Francisco	3140	2946	2840	0	820
Seattle	3088	2894	2788	820	0

I then recreated an MDS plot using the above set of distances. Figure 3.1 below shows the plot recreated. As expected, the distance between cities that cluster together is smaller, while the distance between cities that are located far from each other is larger.

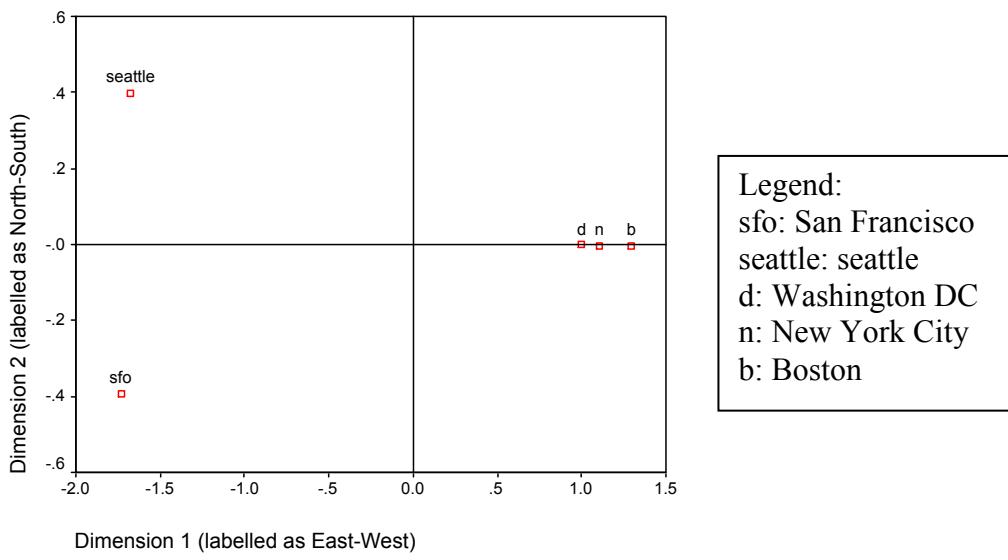


Figure 3.1 MDS plot recreated from the distances in table 3.1 Stress in two dimensions: 0.00081.

c-i) Choice of a measure of proximity

The choice of a proximity measure, i.e. a measure of the “closeness” of one object to another, depends on the research question. In the above example in which I reconstructed a map using distances in miles, the measure of proximity was relatively straightforward. But in the social and behavioral sciences, constructing a proximity measure is often not an easy task, especially because the measure of similarity tends to be subjective.

In this dissertation, the measure of similarity was determined as follows: if an informant put any two items in the same pile, the items were considered to be similar, conversely, if the informant put any two items in different piles, the items were judged to be different (Weller and Romney, 1988). As described by Borgatti (1996), in preparing the data obtained for analysis, each informant's similarity judgments were represented as an item-by-item matrix in which each cell contained either 1 (for items which appeared in the same pile) or 0 (for items which appeared in different piles). Each informant produced one such matrix. The aggregate similarity for any two items,

item_i and item_j, was calculated by adding the values in cell_{ij} across all N informants and dividing by N. The resulting number was the percentage of informants in the sample who placed item_i and item_j in the same pile. The similarities among items in were then examined by subjecting the aggregate similarity matrix to multi-dimensional scaling. Depending on the type of data, other types of coefficients have been developed to measure the distance (see Cox and Cox, 2001 for further discussion on measures of proximity).

c-ii) Assessing the fit of the representation

Because it may not be possible to match the original similarities exactly, scaling techniques attempt to find configurations in q<=n-1 dimensions (where q is the number of dimensions, and n is the number of items) such that the match is as close as possible. The optimal number of dimensions (q) in which to represent the data is often determined by the balance between finding the lowest number of dimensions and obtaining a very poor, highly distorted representation of data. If the representation is highly distorted, this will be reflected in a high *stress* value. *Stress* is a numerical measure of distortion developed by Kruskall in 1964. As Kruskall (1964) defined this measure:

“Stress = $[\sum(d_{ij} - \delta_{ij})^2 / \sum(d_{ij} - d_{\bar{ij}})^2]^{1/2}$ where
 d_{ij} = a monotonic transformation of the input proximity measure
 δ_{ij} = the estimated distance between the ith and jth observations
 $d_{\bar{ij}}$ = the mean of d_{ij} for all i and j such that $i \neq j$ ”

One tries to find the representation with the lowest *stress* as this translates into a more accurate representation of the data. The informal guidelines for interpreting the stress in relation to the fit of the data proposed by Kruskall in 1964 are shown in table 3.2 below. The *stress* obtained in the above example in which a map was

recreated using a set of distances was found to be 0.00081, following Kruskall's definitions, this indicates an almost perfect fit.

Table 3.2: Kruskall's informal guidelines for interpreting the stress

Stress	Goodness of fit
20%	Poor
10%	Fair
5%	Good
2.5%	Excellent
0%	Perfect

One criterion for assessing the number of dimensions that best represents the data is the change in “goodness of fit” that occurs with changes in dimensionality (Schiffman et al., 1981). In this context “goodness of fit” refers to the relationship between the distances obtained in the diagram and the original data. This fit can be depicted graphically by *minimally spanning trees*. The less span the tree has, the better the fit of the geometric representation (Johnson and Wichern, 2002).

c-iii) Interpreting MDS results

To paraphrase Schiffman et al. (1981), the objective of Multi-Dimensional Scaling is to “uncover” the underlying structure among a group of objects which is “hidden” in the data. The analyst often has to determine meaningful directions in the resulting spatial representation. In the above example in which a map was reconstructed, it was relatively easy to label the dimensions as “east-west” and “north-south.” In contrast, in most cases in the social sciences, interpreting the dimensions is only part science and, just as there is considerable room for interpretation in the labeling of the factors in factor analysis, interpreting dimensions is a skill that develops with experience and a thorough knowledge of the subject matter.

In this author’s view, an additional source of ambiguity is that informants, especially those who have not had much formal education, find it difficult to understand how to do a pile sort and, even if they eventually sort, they can often not give “labels” to each group. Without access to the additional information that is

available to the analyst when informants cannot provide labels at the time of the pile sorting, the interpretive task is more difficult. Even with informant labels, interpretation of the dimensions that are produced by a composite analysis that utilizes multiple respondents is a skill that develops with experience and a thorough knowledge of the subject matter. However, as Schiffman et al. (1981) argue, the fact that a dimension cannot be labeled does not necessarily mean that a geometric representation is not useful. Groupings can still occur and be useful in revealing an underlying cognitive order.

c-iv) Uses of MDS

Cox and Cox (2001) note that although there has been some discussion about the use of statistical inference in MDS, it is commonly accepted that the emphasis of MDS remains with exploratory or visual presentational techniques. The authors summarize the use of MDS as follows: “A classic use of MDS has been to reconstruct maps of cities using journey times by road or using actual metric distances. Much of the theory of MDS has, however, been developed in the behavioral sciences, with *Psychometrika* publishing many papers on the subject. It is a tribute to the journal that MDS scaling techniques are becoming a popular method of data analysis, with major statistical software packages now incorporating them into their repertoire.” From this author’s experience, in the social sciences, SPSS (Statistical Package for the Social Sciences), SAS and AnthroPac (Analytic technologies, 1996) can be used to generate MDS.

4) The use of ethnographic research in nutrition and public health

There is a long history of the use of descriptive ethnography in public health and nutrition, which goes back to the 1940s and 1950s (Scrimshaw, 1992). However, until the development of the approach that has been characterized as “Focused Ethnographic Study” (FES) or “Rapid Assessment Procedures” (RAP), the lengthy

time requirements for ethnographic research reduced its utility as a feasible public health activity (Scrimshaw and Hurtado 1987; Herman and Bentley 1992, Gove and Pelto, 1994, Manderson 1996). Focused ethnography in public health is intended to yield a normative description of social and cultural beliefs and practices. It often relies on small and purposive (often opportunistically-selected) samples. A well-conducted focused ethnography should provide information on the types of intra-cultural and intra-group variation that one could expect to find in a given location. By its nature, a focused ethnographic study cannot provide a quantitative assessment of this variation.

For the purpose of understanding the main outlines of practices and beliefs, the RAP/FES approach is proving to be a valuable tool in public health and nutrition (Scrimshaw, 1992). In the past two decades FES and RAP study guidelines and manuals have been developed for a number of public health problems, ranging from diarrhea and respiratory infections to HIV/AIDS (Bentley et al., 1988; Gove and Pelto, 1994; Scrimshaw et al., 1991). In nutrition, the first FES manual directed to a nutritional issue (Vitamin A deficiency) was developed under the auspices of the United Nations University (Blum et al., 1997; Kuhnlein and Pelto, 1997).

Parallel with the development of protocols to facilitate the use of ethnography in public health, there has also been an expansion of research methods and theories in medical anthropology. Ryan (1995) has classified this work into five main types: determinant models, process models, mental models, critical models, and systems models. Much of this work has involved hypotheses testing (e.g. of social determinants of illness management, including care-seeking), using longitudinal research designs on moderately large samples. Thus, they are not immediately practical for use in the design of public health.

However, some of the theoretical developments and research techniques in medical anthropology have direct applicability for RAP and FES studies. For the first study in this dissertation in particular, Kleinman's concept of *explanatory models* (Kleinman, 1980) proved to be an excellent framework for collecting, analyzing and interpreting data on local beliefs and practices related to HIV. An explanatory model is a set of beliefs about the etiology and onset of symptoms, the pathophysiology, and severity of illness, and the type of sick role and treatment of illness. Explanatory models can be seen as *emic* explanations of behavior that give meaning to any sickness and guide action. They guide responses to questions such as: "*What is the nature of this problem? Why has it affected me? Why now? What course will it follow? How does it affect my body? What treatment do I desire? What do I fear most about this illness and its treatment?*" Kleinman's explanatory model has facilitated a substantial body of research, especially in relation to illnesses.

5) Validity (interpretation, representation and generalizability of ethnographic studies)

1. Researcher as an interpreter

In an ethnographic study, the researcher serves as an interpreter in two distinct ways. Firstly, if interviews are conducted in one language, and the results of the study are reported in a different language, by literally translating concepts and ideas from one language to another, the researcher serves as an interpreter to his/her readers because s/he allows them to understand local perceptions and insights that, unless they spoke the language in which interviews were conducted, they would have difficulty understanding.

The second way in which an ethnographic product should be viewed as an interpretation stems from the fact that, like everyone else, researcher can only see and understand the world through his/her own subjectivity, which is shaped by his/her own

culture; by the position that s/he inhabits in his/her own and in international society; and by his/her own idiosyncratic makeup as a human being (Salzman, 2001).

Moreover, respondents may choose to tell one researcher what they perceive as being “appropriate” for him/her to hear. To another investigator, respondents may choose to recount a different story, or to recount the same story differently. Therefore, in ethnographic research, what a researcher brings into the research and into the field may influence findings. As one theorist (Scholte, 1969) described the ethnographer’s situation in the field:

‘The ethnographic situation is ... a complex intercultural mediation and a dynamic interpersonal experience...[where] cultural context and personal circumstances precede ethnographic descriptions and, as such, affect the empirical data gathered.’

Ethnographic research is thus a process of subjective perception, in which the researcher interprets what s/he hears and—in thinking, speaking, and writing about the people interviewed—constructs a picture or a story to represent them. It is for this reason that some ethnographic reports are turned into more personal accounts, written in the first rather than the third person, putting the researcher, as an anthropologist, in center stage, and conveying his/her feelings and reactions as well as those of the informants and collaborators.

Following the above line of reason, one could say that there are as many different truths as there are observers, in other words, truth is not absolute, but relative to one's perspective (Salzman, 2001). But this extreme view readily leads to a dilemma in which one could question the utility of any ethnographic account, and, by extension, any social research that relies on information exchange between investigators and the members of a population. The results of any survey that depend on people to answer questions could be regarded as simply reflections of the ways in

which the respondents interpreted and chose to answer the questions that were identified and phrased by the investigators.

Most ethnographers today would agree with the statement, by Geertz (1973), that ethnographic reports are “essentially contestable,” and “open to debate” and that ethnographic accounts are not “privileged, objective, scientific accounts, but an interpretation of informants’ constructions of what they and their compatriots are up to” (Geertz, 1973). In ethnographic accounts, the intention is to develop a “thick description” that represents a situation as best as possible, given the people a researcher talks to, the questions the researcher asks, and the answers he or she has received.

2. The problem of “exotic selectivity”

As argued by Krumeich (2001), one must be wary of the “abuses” of ethnography. The most common “abuse” of ethnography continues to be the flawed depictions of the exotic “other” who purportedly engage in an array of exotic rituals. Ethnographers have been criticized for taking their own (often Western European or Euro-American) cultural standards and their assumptions regarding gender, race and class as universal truths. For this reason, Krumeich (2001) notes that the ethnographer’s “credibility” as spokesman (or woman) for those studied has been questioned. As one anthropologist (Bickerton, 2003) described the crisis: “This crisis of authority was fuelled by the charges of complicity with colonial regimes directed at traditional anthropologists...” who, in their “attempt to unravel the mysteries of humanity through research into all the peoples of the world, reduced their subjects to either romanticised, passive “primitives” or violent “savages.” This crisis was not limited to former colonial powers. One recent example was the well known American anthropologist Napoleon Chagnon who was charged with “misusing” the Yanomami Indians in the course of ethnographic research and, by “depicting the Yanomami in a

harmful way” (he described them as a violent group who were at constant warfare with each other) the results of his research encouraged increased tribal warfare, and may have left the Yanomami “psychologically damaged” (Gregor and Gross, 2004).

Krumeich (2001) proposes that one way to deal with this “crisis” is to accept that while ethnographic knowledge is based on systematic analysis, the people’s knowledge is based on personal experience. Everyone looks at reality from different angles, and differences of interpretation can be as variable among members of a cultural group as they are between the outside investigator and “the group.” For those engaged in public health, the question is how to take advantage of the richness of a thick, ethnographic description—which provides insights into the ways that people in a particular setting think and act—to design interventions that promote optimal health behaviors, and in which the experiences and the voices of the people whose health is at stake are included.

B) The “Trial of Improved Practices” (TIPS) approach

1) Description of the TIPS approach

The “Trial of Improved Practices” (TIPS) is a tool that was developed under the auspices of the Manoff Group and that is destined for the use of program planners and practitioners, particularly those working in programs designed to improve young child feeding (Griffiths et al., 1997). In a TIPS trial the program planners and practitioners work with families in order to identify child feeding and caring practices, and to find practical ways to improve these practices at the household level.

Following the identification of behaviors that are amenable to change, program managers explore the acceptability (willingness to try) and the feasibility of (ability to perform) a given behavior. Through a TIPS study, they are able to discover the relative ease or difficulty in communicating various recommended practices; modifications that can make the recommendations more acceptable; unanticipated

resistance points that limit behavior change; and the approximate proportion of families in a given sample who are or are not able to modify feeding practices and improve their child's nutrition without additional resources.

As described by Griffiths et al. (1997) TIPS can also be characterized as "consultative research," "household trials" or "designing by dialogue." The authors note that the approach has been tested and refined in many situations, particularly in connection with programs to improve breastfeeding and complementary feeding practices, food hygiene, and micronutrient malnutrition and that the results of TIPS have been used to design program strategies and education materials and to develop locally appropriate messages.

The TIPS constitute the basis of the "consultative research." In the "designing by dialogue" manual, Griffiths et al. (1997), note the importance of conducting some formative research *prior* to the TIPS. This formative research can include ethnographic/qualitative research techniques of data collection such as participant observation, key-informant interviewing and focus group discussions. The formative research could be based on a review of the available literature, an analysis of data sources such as surveys and ethnographic reports. This formative work allows the program planner to identify the most salient infant problems for feeding infants and young children, to choose the categories of participants who should be included in the trial, to select 2-4 sites, and to develop a research plan.

Once this formative step has taken place, the manual describes the basic TIPS process is described as involving the following steps:

1. Conduct an initial home visit to gather background information and interview the mother about the diet of her young child and ask open ended questions about child feeding.
2. Analyze the dietary and feeding practice data to identify positive

feeding practices and problems with the child's diet and usual feeding practices.

3. Prepare a short list of recommended behavior changes that help to address the specific problems and that are likely be feasible for the mother.
4. Conduct a counseling visit with the mother to present several options for improving her child's feeding, to record her reactions to the options and to negotiate with her to choose one or more options that she is willing to try during the following week.
5. During counseling, stress to mothers that the intervention will learn just as much from what the mother was *not* able to do as from what she was able to do. This encourages mothers to be open and honest about what they were /were not able to do.
6. Conduct a follow-up visit to find out whether the mother tried the new practice(s), what happened when she did, whether she is willing to continue the practice, and why or why not. Follow-up visits are generally scheduled about one week after the counseling visit.
7. In analyzing the results, note for each recommendation: the number of participants who agreed, the number who tried the recommendation, and the number who intend to continue with the practice. The analysis should also include the key constraints and motivations that participants encountered.
8. Revise child feeding recommendations to include the recommendations that were most successful and amend them according to mothers' suggestions.
9. In some cases, after the analysis, an additional step is to "check" the findings of the TIPS with respondents who had not participated in the research. The objective of "checking" is to find out whether new groups and individuals confirm or contradict the findings of the TIPS, this is particularly important

when programs are to be developed at the national level and would, for this reason, include a larger target population. Research can be checked using techniques such as Focus Group Discussions.

10. Provide a report which includes the summaries of the feeding problems that are common in the community, identification of the recommendations that participants found most acceptable for improving child feeding, as well as the motivations and constraints that participants encountered as they tried the new practices and behaviors. The report should also include recommendations for future programs, and questions that require additional research.

Griffiths et al. (1997) note that, through participants actually attempting to improve the selected behaviors over the trial period, TIPS help program planners to identify practices that are the most acceptable and feasible in terms of behavior change. This information can then be used to develop future large scale messages or, if a program is designed based on the results of the TIPS, the TIPS can be used to inform the development of communication materials used in the program.

2) Evaluating the standard TIPS protocol as a research tool

The theoretical literature on ethnographic methods and their application in nutrition and health is extensive (see for example: Scrimshaw and Gleason, 1992; Manderson, 1996; Scrimshaw and Hurtado, 1987; Herman and Bentley, 1992; Bentley et al., 1988; Gove and Pelto, 1994, Blum et al., 1997). In addition to the large body of materials of theory and substantive application, there is also a small literature that is specifically concerned with the methodological and theoretical problems of FES and RAP approaches (see for example: Harris et al., 1997 or Utarini et al., 2001). The specific techniques used in ethnography have also been reviewed and critiqued (see for example: Bernard and Ryan, 2000).

In contrast, as an approach or as a technique, the “Trial of Improved Practices”

(TIPS) has been used widely in the field, but has received relatively little attention in the academic literature. This is partly because the TIPS was developed as a tool for program managers in developing country settings, rather than as a research tool (Dickin, personal communication). In the sections that follow, I evaluate the weaknesses of the TIPS as a research tool, and present justifications for the ways in which I modified the standard protocol to suit the purposes of the third study presented in this dissertation.

a) Lack of specification of its theoretical basis

TIPS' roots in various theoretical approaches, including anthropology, market research and nutrition have been made evident (Griffiths et al., 1997). However, the theoretical framework on which TIPS is based has not yet been made explicit. As one of the TIPS authors emphasized “there was a strong reason not to include a theoretical framework—we were trying to keep this as simple and practical as possible so that it would be easy to use for non-academics” (Dickin, personal communication).

In this author’s opinion, since the fundamental orientation of TIPS is a tool to facilitate behavior change, it would be instructive to examine the TIPS in relation to various contemporary theories of behavior change, of which the most popular include the Health Belief Model, the Theory of Reasoned Action and the Stages of Change model. In the paragraphs below, I examine the TIPS procedures in relation to the “Stages of Change” model, a theory proposed by Prochaska and Diclemente (1992) that focuses on the individual. I also examine the TIPS in relation to group models of behavior change. I invite readers to examine the protocol in relation to other theories of behavior change.

As described by Prochaska and Diclemente (1992), the “Stages of Change” posits that individuals or groups pass through 6 stages when changing behavior. These stages include: pre-contemplation, contemplation, preparation, action,

maintenance and relapse. In the first Pre-contemplation stage, individuals have no intention to alter their behavior. Contemplation is the next stage in which individuals acknowledge that a problem exists and consider doing something about it. Individuals in the Preparation stage plan to make a change sometime in the next month. In the Action stage, individuals have made a commitment to change and begin to implement their action plan for behavior transformation. Individuals in the Maintenance stage are working to prevent relapse and to maintain the success they achieved during the Action stage. Highlighting the difficulty of initiating and sustaining health behavior change, the model posits that, in order for an intervention to be successful, it must target the appropriate stage of the individual or group. From the perspective of the Stages of Change model, one can ask whether the TIPS approach assumes that all individuals are at the same “stage.” Also, an examination of TIPS with respect to the Stages of Change model also leads one to ask how a TIPS study deals with the fact that initiation is only one stage, and that other issues may be involved in maintaining new behaviors over time.

Individual-focused theories of behavior change are based on understanding the behavior of individuals within the paradigms of social psychology and health psychology. An important assumption of these cognitive models is that a compilation of an individual’s perceptions about the susceptibility and severity of a health threat, perceived advantages and disadvantages of preventive actions, and perceived barriers, determines her/his willingness to change. Barriers range from material factors (such as lack of transport or money), to social norms (how others will judge the new behavior) and self-efficacy (the estimation of one’s ability to perform a behavior). However, in recent years, the strong emphasis on individual cognitive processes and its limited attention to the embeddedness of human behavior in cultural contexts and social structures has been criticized, and the importance of intervening at the

community level emphasized (see for example Williams and Jones, 2004). From this perspective, one of the theoretical criticisms of the standard TIPS protocol is that it focuses on the individual's psychological process, without much emphasis on the social, cultural and economic context in shaping behavior.

b) Lack of clear guidelines on how to analyze the data obtained

Although data collected using the TIPS protocol has a strong verbal component, which results in a large volume of text which could, in turn, lend itself to rigorous text analysis, the protocol is relatively lean on instructions for data analysis. The protocol advises developing tables which note, for each recommendation, the number of participants who agreed, the number who tried the recommendation, and the number who intend to continue with the practice. The protocol also notes that the analysis should include the key constraints and motivations that participants encountered, but does not provide further information on how these constraints and motivations could be identified and interpreted. As with the theoretical framework, because the protocol is intended for use by non-academics, the authors wanted to “avoid the collection and analysis of large amounts of textual data which tend to become a stumbling block for non-researchers” (Dickin, personal communication).

However, adapting the tool for the purposes of research requires attention to the analysis of the text. Elsewhere, for the purposes of text data analysis, a variety of approaches have been described, the most common of which are content analysis and thematic analysis (see for example: Bernard, 1998 or Miles and Huberman, 1994). A number of software packages have also been developed to code and manage large volumes of text data (see for example: QSR, 2002). Once the data has been coded, thematic analysis can then be conducted by searching transcripts for a) “schemes” or “scripts” b) “stories” or “narratives c) relationships that emerge among a set of “things” within the text and; d) shared ideas and values or “cultural models.” Lack of

clear guidelines for the analysis of the data obtained using the TIPS protocol is a serious limitation to the use of the procedure as a research tool, particularly for permitting external observers to evaluate the conclusions and assess their applicability to other situations.

c) Number of sites

The TIPS protocol (Griffiths et al., 1997) proposes selecting 10-15 individuals from each site or community, and a total of two-four sites. In this author's view, this approach yields more "breadth," and it allows the results of the research to be more generalizable. For an investigator with fixed resources and limited time, the trade off is that the approach yields less "depth." It is for this reason that, in the third study in this dissertation, I chose to focus on a group of women drawn from one site, and to obtain rich, descriptive information from the sample.

d) Logistics of the TIPS

Typically, the TIPS is designed to improve infant feeding practices for infants and young children. For the specific purposes of the first six months of life, a TIPS manual has been developed by Favin and Baume (1996). The manual is entitled "guide to qualitative research for improving breastfeeding practices." In both Griffiths et al. (1997) and Favin and Baume (1996), the assumption is that all consultation with mothers are conducted once the baby has been born.

Because the newborn period is characterized by rapid changes for both the mother and the newborn, and because it is a very limited period of time (28 days), in my research, it was important for me to begin interviewing the mothers even *before* they had delivered. For this reason, in contrast to the standard TIPS protocol where recommendations are provided based on an observation of the mother's behavior, in my research, I suggested changing *intentions*, rather than actual practices.

In sum, in this research, it was necessary to modify the standard TIPS protocol

in order to best benefit from the advantages the protocol offers, while overcoming its limitations as a tool for research. These modifications included: a) considering the multiple influences on infant feeding behavior; b) using rigorous text analysis to analyze the interview transcripts obtained from the tape-recordings; c) interviewing women before and after delivery, rather than conducting postpartum interviews only and; d) conducting the research in one site. These modifications make the resulting protocol used sufficiently different from the standard TIPS. It is for this reason that, in chapter 8 that follows, I describe the approach used as “inspired” by the TIPS.

C) Conclusion

The next chapters in this dissertation present three studies that used the theoretical and methodological approaches reviewed above. The first and the second studies are “purely ethnographic,” while the third study is “inspired” by the TIPS. All text data were analyzed using the “grounded approach” to text analysis. Although the standard TIPS protocol focuses on the individual, in analyzing and interpreting data, the cultural contexts and the social structures in which infant feeding behavior is embedded will be highlighted. In addition, following the ethnographic approach of putting the participant in center stage, in the studies, respondents’ beliefs, knowledge and attitudes will be conveyed as accurately as possible.

CHAPTER 5¹

SOCIAL CULTURAL INFLUENCES ON INFANT FEEDING DECISIONS
AMONG HIV-INFECTED WOMEN IN RURAL KWA-ZULU NATAL,
SOUTH AFRICA

A) Objectives of the study

The objective of this ethnographic study was to investigate socio-cultural influences on infant feeding decisions in a sample of HIV-positive women who had been given counseling about infant feeding and HIV. The investigation was embedded within an on-going study designed to examine the postnatal transmission of HIV in a cohort of women who had chosen to exclusively breastfeed or to exclusively replacement feed (Africa Centre for Health and Population Studies, 2001). Women attending prenatal care are provided with free HIV counseling, testing and provision of nevirapine if they are positive.

Drawing on a small sample of mothers enrolled in the larger cohort study, this study explores the role of cultural, social, economic and psychological factors in

¹ Part of this chapter is published in: Thairu LN, Pelto G, Rollins NC, Bland RM, Ntshangase N (2005). "Sociocultural influences on infant feeding decisions among HIV-infected women in rural Kwa-Zulu Natal, South Africa." *Maternal and Child Nutrition* 1(1): 2.

women's decisions about infant feeding and their subsequent practices. To appreciate the significance of this focus, it is important to know that the cultural pattern in the study region is one in which, during the first six months of the infant's life, mixed feeding is the norm, but exclusive breastfeeding is not (Bland et al., 2002). Infants are given breastmilk substitutes when their mothers are away from home and they are left with other caregivers (Bland et al., 2002). Typically infants receive semi-solid foods before the recommended time for introducing complementary feeds (i.e. six months of age). Giving foods, teas and other liquids is motivated by well-established beliefs about how infants should be fed.

Previously in this area only a very small minority of infants exclusively received breast milk or formula milk during the first six months of life (Bland et al., 2002). Customarily, the baby is put to the breast within a short time after delivery, and during the subsequent weeks the breast is used as a comforter/pacifier even when the infant is predominantly replacement fed. Thus, the success of the ongoing cohort study in reducing HIV transmission through breastmilk depends on its ability to change strongly held cultural practices and beliefs.

B) Research setting

The large cohort study, in which this ethnographic study is embedded, is being conducted in Hlabisa district in rural kwaZulu Natal, South Africa where the prevalence of HIV infection among pregnant women approaches 40%. Hlabisa is located on the northern part of KwaZulu Natal (see map on figure 5.1 below). The district covers 3729 square kilometers. Approximately one third of this area (1218km²) is covered by natural reserves, the major ones being the Umfolozi, Hluhluwe and St. Lucia reserves. The area has a population of about 220 000, all Zulu speaking. The average number of people per household is 7.5 (compared to 5.1 in the rest of South Africa), and over half of these households (51.5%) are female headed.

According to Curtis et al. (2002), the economy in KwaZulu Natal is mainly agricultural, with gum trees and sugar cane being the main cash crops. These crops are often grown on large plantations, and are often not small scale holdings. Most people in the district derive their income by working on plantations. However, these sources of formal employment are limited, and there is a high level of unemployment—over 59% of the 15-64 year-old age group are unemployed, which is almost double the national average of 34%.

Curtis et al. (2002), explain that, in terms of sanitation, about 47% of households do not have toilets, 40% use pit latrines, and the remainder use flush toilets. Only 12% of the households in Hlabisa have piped water in the dwelling, 11% use piped water from a public tap and the remainder (65%) obtain their water from dams and rivers.

According to Tanser (2000), there is one government hospital in the northern part of the region, 14 fixed government clinics, and 2 mobile clinic services that provide health care in the more rural areas. In 2001, over 95% of the public health care workers were nurses. There were a few full-time doctors and over 300 registered traditional healers. In terms of education, only 16% of people over 20 years of age have a matric (secondary school education) or higher. This is slightly lower than the national average of 23% or the provincial average of 20%.



Figure 5.1: Map indicating Hlabisa district

C) Structure of the Africa Center project

While the objective of the Africa Center project is to promote exclusive breastfeeding for up to 6 months, followed by rapid and safe transition from breastfeeding to some replacement milk, they also want to ensure that women make an informed choice and understand the option to practice exclusive formula feeding. Thus, the nutrition and health information conveyed through the project is a major part of the intervention, and the method by which it is conveyed (group counseling, one-on-one counseling and support) is a major component.

In brief, the structure of the project is as follows:

- 1) Counseling, testing for HIV, and administration of anti-retroviral drugs
 - a) In order to benefit from nevirapine, offered at no cost for all HIV positive mothers in the district to prevent mother to child transmission of HIV, women must first know and accept their HIV status. Because there is a great deal that women need to know before deciding whether or not to be tested for HIV, and much of this is straightforward information that can be imparted in groups (UNAIDS, 2001), at the time of routine prenatal visits in 6 local government health centers in Hlabisa district, all pregnant women are invited for group counseling on HIV and infant feeding by project personnel. Typically, women are counseled in small groups of 5 to 10.
 - b) After basic information has been given, most people need counseling at an individual level to help them assess their level of risk and consider the implications of a positive or negative result in their own situation before deciding whether or not to be tested (UNAIDS, 2001). Thus, following group counseling, project personnel invite women for individual counseling at which time they are provided with information about testing for HIV. Because the vast majority of women are attending the clinics for medical consultation, and not for HIV testing, those women who choose to be screened are apparently healthy individuals and, if they test positive, have often not yet progressed to AIDS.
 - c) For those women who choose to test for HIV, an ELISA test is used as a first step to testing and, if this is positive, a second ELISA or western blot used to confirm the results. Because samples are collected in the clinics and taken to Durban for analysis, an appointment is scheduled 2 weeks after testing to obtain results. On average, about 50% of women agree to be tested, and about

half of these come back for their results. In other words, only 25% of the women approached at the clinics obtain their results. This is consistent with other intervention trials to prevent MTCT in sub-Saharan Africa in which, because many pregnant women do not know about testing opportunities before arriving at clinic settings, they may be surprised by the offer of a HIV test and refuse on the spot or tell counselors that they wish to postpone their decisions, often amounting to deferred refusal (Cartoux et al., 1998; Painter et al., 2004; Painter et al., 2005). Various authors have suggested that the following factors are associated with women's willingness to be tested for HIV: perception of oneself as being at a high risk of contracting HIV; trust that the results will be kept confidential; support from the partner; religion; stigmatization from close relatives and the local community; and the possibility of obtaining benefits such as free antiretroviral drugs and infant feeding counseling (Cartoux et al., 1998; Maman et al., 2000; Maman et al., 2001; Maman et al., 2002, De Paoli, 2004).

- d) If women test HIV positive, if they have no intention of returning to work or school within two months of delivery or of leaving Hlabisa district within three months of delivery, and if they are over 16 years of age, they are invited to participate in the trial.
- e) In all cases, women who choose not to test for HIV are not invited to participate in the study. In addition, all women who test—regardless of whether they choose to participate in the study—are provided with counseling on HIV and on infant feeding. In line with UNAIDS/UNICEF/WHO recommendations for infant feeding (1997), women who test negative are encouraged to exclusively breastfeed, while women who test positive are fully informed about the various options available to them, and allowed to choose

their preferred method of infant feeding.

- f) All HIV positive women who agree to participate in the study receive a 200mg tablet of nevirapine at about 30-34 weeks gestation to help prevent intra-partum infection. These women are instructed to take the antiretroviral once they are certain that labor is established, whether they deliver at home or in a health care facility.
- g) A dose of nevirapine is also provided to infants within 72 hours of birth. If mothers deliver at home, they are instructed to bring the infant to the clinic within 7 days.
- h) Blood samples are collected from infants at birth, 6 weeks, and every 4 weeks thereafter until the infant is 18 months of age. This is designed to coincide with the routine childhood immunization schedule in the district. Samples collected at 6 weeks and 22 weeks after birth are processed real time using the RNA PCR assay—mothers are given these test results and counseled again about their options. The remaining samples are stored and analyzed later to determine the timing of HIV infection among those infants who become infected.

2) Infant feeding counseling

- a) Women who indicate their intention to breastfeed are visited at home by trained breastfeeding counselors during the last 3 weeks of pregnancy to prepare and deal with concerns about starting breastfeeding immediately after delivery. After delivery, the breastfeeding counselor visits them at least once a week in their homes. When women decide they can no longer breastfeed exclusively, the role of this counselor is to help them make a rapid transition to a non-breastmilk diet.
- b) Because the breastfeeding counselors are not trained to support replacement

feeding, women who choose replacement feeding are supported in their choice by trained nurses during routine visits to the clinic. This also allows the nurse to identify any problems as soon as these occur.

D) Methods

1) Interview procedures

The ethnographic study was conducted from June to August 2002. Informed consent was obtained from all the individuals who participated in the study, and approval was obtained from the research ethics committees of both the University of Natal and Cornell University. To prepare a set of guiding questions for interviews with the mothers, the results of which are presented in this paper, I first carried out an exploratory phase. This was comprised of interviews with counselors and nurses working for the Africa Centre project. Exploratory interviews with counselors and nurses were very open-ended discussions in which respondents were encouraged to talk about their experiences, and questions took the form of probing for detail, with encouragement such as “Can you tell me more about that?” “Could you give me an example of _____?” “What did you feel when that happened?” I conducted the interviews myself in English. By the end of this first round of interviews, I had identified a number of issues or factors that appeared to be related to feeding choice. During the exploratory phase, I also observed routine, individual counseling sessions in women’s homes and attended 5 routine, group counseling sessions held in participating clinics.

With the help of a research assistant from Hlabisa, I then created a set of cards to use in interviews with a small sample of mothers enrolled in the cohort study. Each card contained a word or phrase, written in Zulu, that was used as the stimulus to discuss a specific issue or factor that we felt was relevant for women’s decision-making. The content of the cards was as follows: (1)*Work*; (2)*School*; (3) *What you*

know about HIV; (4)Your health; (5)Your baby's health; (6) People living with you; (7)Hospital's view of breastfeeding; (8)How your counselors advise you to feed your child; (9)Your partner's knowledge of HIV ; (10)Your family's knowledge of HIV; (11)Your friends; (12)What you believe about formula feeding; (13)What you believe about breastfeeding; (14)Cost of formula feeding; (15)What you fed the children you already have.

There are 6 clinics participating in the larger cohort study; women in the cohort are assigned to a clinic based on their place of residence. Two clinics were chosen for the interviews: one because it was the most rural of the six, the other because it was the most urban. As of June 2002, there were 205 HIV positive women enrolled in the cohort study. From this cohort, women who had already delivered were asked if they would be willing to be interviewed when they came to the two clinics for routine postnatal visits. None of the women we approached refused to participate. As most women did not speak English, interviews were carried out with the help of a Zulu-speaking research assistant from Hlabisa.

In this way, we recruited a sample of 22 women for the semi-structured, ethnographic interviews. These women constitute a convenience sample because they were women who happened to attend the clinics on the days during which we were interviewing. In interviews with the mothers, we would shuffle the cards we had previously developed, show them, one by one, to the respondent and ask: "*how did [concept written on the card] influence your choice of infant feeding?*" For example, "*how did your friends influence your choice of infant feeding?*" The questions presented to the women are outlined in appendix 5.1. Interviews were conducted with the help of the cards as stimuli and a tape-recorder to record the conversation. As some of the women did not read comfortably, the word or phrase on the card was always read to them. The advantage of the cards as an interview tool was that the

technique helped to make the women feel comfortable talking about sensitive topics.

2) Data analysis

All interviews were tape-recorded and transcribed using standards required for conversation analysis, which includes notation of hesitations, pauses in conversation and laughter (Seale and Silverman 1997).

The text retrieval software (NUD*IST), was used to code the text (QSR 2002). To start, any text concerning infant feeding was extracted, and coding was done at several levels, beginning with broad descriptive coding (e.g. “formula”), followed by more refined coding as the text analysis progressed (e.g. “no money to buy formula”). The next step in the analysis was to compare interview content across respondents. Although the coding system made it easy to compare responses to the specific cards, this analytic approach failed to capture the context of the statements, which were important for understanding their meaning. We therefore turned to a different type of analysis in which we searched for themes that appeared in more than one interview. For each theme, the context of the statement and characteristics of the respondent were noted in order to build a fuller description.

E) Results

The findings from the study are presented here in terms of “themes” related to the women’s decision-making about how to feed their infants. Where tables are utilized to further expand a given theme, and to report knowledge, beliefs and attitudes, the number of women who mention a belief out of the total sample is indicated. This provides an indication of the extent to which the belief is widespread. For example, a belief generated by 22 out of 22 respondents can be considered pervasive, compared to a belief mentioned by only one or two respondents. In addition, a mother can mention more than one belief, for example, as shown in table 5.2 that follows, a mother can note that “HIV can be transmitted through having unsafe sex” and also that “HIV can

be transmitted from the mother to the child.”

Sample characteristics

The characteristics of the sample are shown in Table 5.1 below. Compared to women in the larger cohort study, women in the ethnographic sample were more likely to be main income providers (28% vs 10%) and to use infant formula (23% vs 18%).

Table 5.1: Characteristics of the full study cohort (as of June, 2002) and the ethnographic study sample

Characteristic		Full study cohort N=205	Ethnographic study N=22
Mean age (SD)		26 (9)	28 (7)
Median parity (range)		1 (0-8)	2 (1-6) *
Mother is main income provider (%)		20 (10)	6 (28)
Place of residence	Rural	Not known	6 (27)
	Peri-urban		16 (73)
Highest educational level achieved (%)	None	15 [†] (7) [†]	Not asked
	Some primary	99 (49)	
	Some secondary	52 (25)	
	Completed secondary	39 (19)	
Infant feeding choice	Breastfeeding	187 (91)	17 (77)
	Formula	18 (9)	5 (23)

*All 22 women had delivered; their infants were all under 6 months of age.

Units: Number[‡] (%)[†]

Theme 1: HIV

a) *Mothers explanatory models of HIV*

In general, mothers were highly conversant with the current biomedical information about the transmission of HIV. They knew that the disease can be transmitted through the following ways: a) unsafe sex, b) from the mother-to-child transmission of HIV particularly through breastmilk or during childbirth c) through contact with contaminated blood. As one 19-year old mother expressed the modes of transmission.

HIV is a virus which you can get in many ways. If you do not use a condom when you are having sex, or if you use a razor blade that was used

by someone who is HIV positive or if you help a person who is injured and if you are not wearing gloves, if the person is HIV positive you will also get [the disease]. I know that the baby gets it during birth, if the mother is HIV positive, and if the baby [gets in contact] with the mother's blood, the baby can get the virus. They say the baby can also get the virus from breastmilk if you mix feed him.

Mothers' beliefs about the etiology of the disease are summarized in table 5.2.

Table 5.2: Mothers' beliefs about HIV and about the modes of transmission

Beliefs	Number of women who mentioned belief*
"HIV can be transmitted through having unsafe sex"	13 out of 22
"HIV can be transmitted through contact with contaminated blood (e.g. using contaminated razor blades or touching infected people who are bleeding without wearing gloves)"	11 out of 22
"HIV can be transmitted from the mother to the child (through breastmilk/breastfeeding, during pregnancy or during birth)"	9 out of 22

*These beliefs are not mutually exclusive and a woman may mention more than one belief

Mothers also knew that the disease can be prevented through various ways, including the use of condoms during sex, exclusive breastfeeding and the use of nevirapine.

Mothers' beliefs about HIV prevention are summarized in table 5.3 below.

Table 5.3: Mothers' beliefs about HIV prevention

Mothers' beliefs about HIV prevention	Number of women who mentioned belief*
"To prevent HIV infection while having sex, use a condom"	7 out of 22
"To prevent mother-to-child transmission of HIV, use nevirapine"	5 out of 22
"To prevent mother to child transmission, breastfeed exclusively"	2 out of 22

*These beliefs are not mutually exclusive and a woman may mention more than one belief

As Kleinman (1980) has described explanatory models as follows: “*an explanatory model is a set of beliefs about the etiology and onset of symptoms, the pathophysiology, and severity of illness, and the type of sick role and treatment of illness. Explanatory models can be seen as emic explanations of behavior that give meaning to any sickness and guide action. They guide responses to questions such as: What is the nature of this problem? Why has it affected me? Why now? What course will it follow? How does it affect my body? What treatment do I desire? What do I fear most about this illness and its treatment?*”

We noted conflict between some of the women’s explanatory model of the disease and the information that the women received about the risk of transmission of HIV (i.e. the biomedically accepted explanatory model). For example, some of the women believed that, if a pregnant woman was HIV infected, the infant must be HIV infected at birth. Consequently, the women may not have understood how HIV transmission can be prevented during or after the baby is born. As one 33-year old woman expressed her beliefs about transmission of the disease:

I think that [...] when you become pregnant, the baby is made of the virus in you. If you are HIV positive, your baby will also be HIV positive

Another 34-year old expressed her belief as follows:

The baby gets it [because] it is made of sperms, it gets it when the mother has sex with the father, if one is positive, the baby gets it from the beginning

We noted an additional source of conflict between the information received with regard to breastfeeding, and the women’s own explanatory model of disease. Women perceived breastmilk as being infected with the virus. On the other hand, their counselors informed them that they could feed their babies with this infected

liquid. This information did not fit with women's understanding. The same 33-year old mother implicitly expressed the conflict follows:

Breastmilk contains everything. It gives health to the baby. Breastmilk is very good. But what is bad is that, now that I am sick, the baby is breastfed by an unhealthy person. I don't think the baby can be healthy if I am HIV positive.

As one 29-year old mother expressed the difficulty of understanding the information :

After I tested and got my results, they [counselors] said that breastfeeding is not a problem, but only if I do it exclusively [...] I knew then that I was sick, and I wondered whether this breastmilk will be enough for my baby.

b) *Social stigma of HIV infection*

A pervasive theme identified in the interviews with the 22 women was the stigma associated with HIV and the relationship of choice of feeding mode to social disapprobation. In a community where breastfeeding is normative in the strongest sense of that word, choosing replacement feeding would have seemed abnormal, even prior to the advent of the HIV epidemic. Now there has been sufficient public discussion about transmission of the virus through breastmilk that choosing to bottle feed is tantamount to announcing that one is HIV positive.

Negative attitudes toward victims of the disease were a common theme in the

interviews. For example, one woman described her family's (general) reaction to HIV positive people as follows: "*I always hear when they talk about HIV positive people, they isolate them [...] as if, if you [have] the virus, you are [...] not behaving good. They don't know you can get the virus in whatever way.*"

As a consequence of negative community attitudes, women face a very difficult decision about whether to disclose their HIV status when they learn they are infected. Most of the women we interviewed had decided not to disclose their status, even to their families. A woman who had chosen breastfeeding and kept her status confidential from her family noted: "*I don't see the reason for that, to tell them [I am HIV positive]? There is no need, there is nothing I need to discuss with them.*"

The five women who had decided to use replacement feeding discussed the relationship between their feeding choice and disclosure. One woman, who had negotiated formula feeding with her husband, and whose husband knew of her HIV-positive status, said: "*What I am doing is none of their business, people talk, you know? If they see these cars [from the Africa Centre] coming [for home visits] they start talking [saying] you know she is HIV positive, [they speak] of something they don't know, so you just need to [ignore] them.*"

For women who deliver their babies in local hospitals, the dilemma of disclosure in relation to feeding choice is immediate at the time of delivery. Most

² Indicates that text has been modified to facilitate readability

women perceived the hospital personnel as being supportive of breastfeeding (see Table 5.4 below) and that not breastfeeding in hospital therefore required disclosure of their status. As one counselor explained the situation: “*...hospitals [here are] baby friendly, they promote breastfeeding, so when [mothers] come to hospital [they] have to explain to the nurses why [they] are not breastfeeding, [so they think] think ah, rather than explaining [they are] HIV positive [...] let me breastfeed. [Mothers] don't want their status known to everybody, so generally that is the reason.*” Asked why they do not want their status known, the counselor replied: “*Around here it's still a stigma, HIV is still stigmatized [...] it hasn't got to the stage where it's accepted just like any other disease.*”

Table 5.4: Women's perceptions about the mode of infant feeding promoted in local hospitals

Perception	# of mothers expressing this view
“Hospitals encourage breastfeeding”	16
“They didn't tell us anything”	1
“They say it's your choice”	1
“They don't encourage breastfeeding”	1
Total	19*§

* Question not asked for 3 of the 22 women

§ Responses are mutually exclusive, a respondent can only generate one response

c) *Communication with family and significant others about the disease*

Although the mothers participating in this study were HIV infected, and although they were somewhat knowledgeable about the ways in which the disease could be transmitted, mothers rarely talked about the disease with their partners or with their families. Mothers assumed that their family members knew about the disease from popular media such as radios and newspapers, but noted that they had not discussed the disease within the family. Mothers expressed this lack of communication with their families and significant others with phrases such as “*I know that [my family] knows about [HIV] but I don't know what they know*” or “*Most of the*

time I don't live with my partner, like right now he is not here, he will come back in October, so I don't have time to talk with him about it."

Mothers who had children who were "old enough" reported discussing the disease with their children, and advising their children to protect themselves. As one 41-year old mother described her advice to her daughter:

My family knows many things. Even if they don't know about my status because I didn't tell them [...] I have a grown child, I tell her about HIV, I tell her "if you fall in love with a person and have sex without a condom, you will get AIDS." I tell her to be careful about these things. I tell her in everyway I can.

In the study, we noted the influence of age in the discussion about disclosure. For example, compared with older mothers, many of whom chose to discuss their HIV status to us even though we did not ask them for this information, younger mothers appeared less likely to tell us they were HIV positive (see table 5.5 below), however, this association was not statistically significant ($p<0.12$). Examples of older women's discussions of their status with us included: "*The counselors say I have it [HIV] in me, but I don't see any signs of it in me*" or "*When they were taking blood there is a disease they found in me so I decided I must formula feed my baby*" or "*I chose to breastfeed after I got my results and they said breastfeeding is not a problem if I do it exclusively so I chose breastfeeding.*"

Table 5.5: Age and disclosure of HIV status to the interviewer

Woman's age	Disclosed HIV status to interviewer	Did not disclose status	Totals
≤ 19 years old	1	5	6
≥ 20 years old	9	7	16
Totals	10	12	22

A counselor summed up the situation for younger mothers as follows: “*Teenagers most of the time they are not taking [HIV] seriously compared to [older women], [...] sometimes when they experience [...] difficulties it is hard to talk to their parents because they don't even want them to know that they had [sex]. Most of the time, teenagers deny [their results]; they are very happy when the results are negative, they forget the window period, so they are negative, but they could be positive.*”

Theme 2: Infant feeding and fear of HIV transmission through breastmilk

a) ***Infant feeding practices in the sample***

All mothers in the study had previously received information about the possibility of HIV transmission through breastmilk, and about the importance of exclusive breast or formula feeding. Mothers who had chosen to breastfeed were supported by breastfeeding counselors who visited them at least once a week in their homes. Mothers who had chosen formula feeding were supported in their choice by project personnel during routine visits to the clinic. As shown in table 5.1, in the study, 77% of the mothers elected to breastfeed, while 23% chose to formula feed.

In the interviews, few of the mothers talked about other foods and solids fed to their infants. The foods and solids mentioned included Cerelac³ and porridge with

³ “Cerelac” is a brand of cereal manufactured by Nestle. Nestle describes the product as a “highly nutritious, easily digested instant cereal. Suitable as a complimentary food for infants from 6 months onwards when breastmilk or formula alone can no longer

milk and butter. However, because the mothers knew that the cohort study advocated for exclusive breast or formula feeding, we suspect that mothers were afraid to tell us about the other foods and liquids they gave to their infants. For example, although mothers described themselves as “breastfeeders” or “formula feeders” their infant feeding practices were not static and some mothers switched from one mode of infant feeding to another before six months were over. This switching may have been a response to the infant’s cues. One 34-year old mother expressed her reason for switching from breastfeeding to formula feeding as follows:

He is now five months old, he started breastfeeding when he was born, and then he refused it at three months so I began to formula feed him.

A 19-year old expressed the switch from formula feeding to breastfeeding as follows:

I gave him formula but he didn’t like it, so I stopped it and continued with breastfeeding.

meet the baby's growing nutritional requirements. Cerelac is not to be used as a breastmilk substitute. The Cerelac range is intended for spoon feeding only and only one or two meals should be given a day (unless otherwise advised by a doctor or health care professional). Cerelac is available in seven varieties which include: Cerelac Rice, Cerelac Wheat, Cerelac Wheat –apple, Cerelac Wheat – banana, Cerelac Wheat – honey, Cerelac Wheat - 3- fruits and, Cerelac Wheat - 4 –Vegetables.”

For some mothers, this switching back and forth may have occurred more often, leading to mixed feeding. As one 34-year old mother described her infant feeding behavior:

I buy infant formula when my baby refuses to take breastmilk. But if there is no problem, I give her breastmilk and then feed with other foods such as Cerelac.

Statements that relate to transmitting infection through breastmilk occurred in many of the interviews (14 out of 22). Sometimes the statements were explicitly associated with fear of infecting the infant. Of the 5 HIV-infected women who chose to give their infants formula, 4 talked about their fear of transmitting the virus to their infants. As one of these mothers explained: “[at the clinic], when they [were] taking blood there is a disease they found in me so I decided I must formula feed my baby [...] the breastmilk I believe in it because it’s the thing I am used to but...[silence].”

On the other hand, the potential for transmission was sometimes discussed without an explicit statement of fear as in the case of a woman who explained: “I must breastfeed my baby until he is 6 months old, not giving anything else, even formula milk. The reason is that if I mix feed my baby he will get this sickness I am having.”

Theme 3: Perceived quality of breastmilk in comparison to infant formula

Statements about the positive qualities of breastmilk appeared in nearly all of the interviews, especially with women who had elected to breastfeed. Sixteen of the 17 women who had chosen breastfeeding mentioned that breastfeeding “protects against diseases.” Often the value of breastfeeding was juxtaposed to formula, as in the following statement: “The baby who is formula fed always gets sick.” The strength of the belief in the superiority of breastmilk over formula is so great that one of the women who had chosen infant formula felt obliged to counter the prevailing view, explaining “I have never seen any problem, the difference between formula feeding

and breastfeeding? I don't see any problem."

Women's beliefs about the use of infant formula are summarized in table 5.6.

Table 5.6: Women's beliefs about the use of infant formula

Women's beliefs and perceptions about the use of infant formula in juxtaposition to breastmilk		Number of women expressing belief*
Negative perceptions about infant formula	<i>Babies who are given infant formula often get sick (e.g. because the bottle used to feed formula was not carefully washed)</i>	6 out of 22
	<i>Infant formula is expensive</i>	4 out of 22
	<i>Preparing infant formula is not easy (e.g. washing bottles)</i>	2 out of 22
	<i>Babies who are formula fed do not grow as well as those who are breastfed</i>	2 out of 22
Positive perceptions	<i>I don't see any difference between formula and breastmilk</i>	3 out of 22
	<i>Infant formula is convenient (e.g. if you go to work and leave your baby with other people)</i>	3 out of 22

* The beliefs are not mutually exclusive, a mother can express more than one belief

Although women knew about the benefits of breastfeeding, they voiced their doubts about the sufficiency of breastmilk as the sole source of nutrition for the baby for 6 months. As one 33-year old mother expressed her doubts:

They say it is important that you give your baby breastmilk and then after six months you can stop breastfeeding and give other foods, like you can cook porridge with butter, but don't put too much sugar. But me, I am confused, I don't understand how the baby can live with only breastmilk for 6 months.

Theme 4: Formal employment and the role of economic circumstances in infant feeding decision-making

The role of economic circumstances and the importance of paid employment and its financial benefits were a common theme in women's infant feeding decision-making. As one woman who had chosen breastfeeding explained: "*I am not working, I don't even have the money to buy formula milk.*" Another woman who had also chosen breastfeeding reported: "*My husband is very happy if I give breastmilk to my*

baby [...] money to buy milk is a very great problem because he is not working, that's why he [prefers] that I give breastmilk to the baby." Women who had chosen formula feeding also noted the economic difficulties associated with their choice. One of these women complained: "*The tins are very costly. At home we take 6 [tins] for a month, but it doesn't end. It doesn't end. Six, six, six, but they don't last for a month, when the month is [halfway through] we need to go and buy more. [At least] with breastmilk, you know you can take that money and buy other things."*"

Although women noted that money was a problem, the majority of the women (17 out of 22) chose not to work so that they could take care of their children. These women intended to search for jobs once their babies were "old enough." As one 33-year old woman expressed her choice:

I will look for work when my baby is old enough. The one thing which makes me [choose] not to look for work is that I don't want to leave my baby with someone else, because I am trying to make sure that no one is doing all those things which they [counselors] said we must not do. If you leave your baby with someone, she can give him water, give him food and all those things.

Another woman (who was 29 years old) expressed her choice not to work as follows:

I was working before. The problem was that I got pregnant. The white lady I was working for also had a baby. When I told her I was going to go to the clinic, she asked me who she was going to leave her baby with, so I decided to I must leave that job.

Women's choices about paid employment and infant feeding are in table 5.7 below.

Table 5.7: Women's employment status relation to infant feeding

Employment status	Number of women*
Chose to stop working so that she can breastfeed the baby	17
Husband will not allow her to work	1
She cannot find a job	1
Her mother and her mother-in-law are providing financial support, so she does not need to work	1
Not mentioned	2
Total	22

* Because these responses are mutually exclusive and only one response is possible, the total adds up to 22

Theme 5: Age and family influences on feeding practices

The family appeared to influence younger mothers, particularly in relation to exclusive breastfeeding. Of the 19 who reported that their families encouraged breastfeeding, three mothers (aged 18, 19 and 29) noted that family members did not approve exclusive breastfeeding. As the 29-year old mother said:

“[Older people] at home they wish to see the baby eating [...] they like to see the baby eating every time [...] they believe if the baby is crying [you should] give him something to eat.”

An eighteen year old mother who had chosen breastfeeding reported:

“At home they say breastmilk is not enough for the baby, they say I must give him other foods so that he can grow. They feel it’s a burden [for] me to give only breastmilk.”

The effect of social independence on the importance of family influences is apparent in the differences between older and younger respondents. Although about one third of the sample was under 19 years of age, none of the women who decided to feed formula were under 19. With regard to her family, one 33-year old woman who had chosen infant formula told the interviewer: “*What can [they tell me]? Only I am staying with my children.*” Three of the mothers reported that they were solely

responsible for their infant feeding decisions and that, for this reason, their family did not influence their choice in any way. Of the three, all were over 25 years of age.

Table 5.8: Age and infant feeding decision

Woman's age	Reported to have chosen breastfeeding*	Reported to have chosen infant formula*	Totals
≤ 19 years old	6	0	6
≥ 20 years old	11	5	16
Totals	17	5	22

* The choices (breastfeeding or infant formula) were mutually exclusive, and only one response is possible for each respondent, the total adds up to 22

F) Discussion

We do not have definitive evidence that our descriptions represent normative beliefs and practices among HIV positive mothers in Hlabisa. Firstly, the findings reported here are based on self-reported data from one small convenience sample making it unlikely that women who participated in the study were representative of the general population of HIV positive mothers in Hlabisa. Secondly, to be included in the larger cohort study from which the sample was drawn, a Hlabisa woman had to go through several selection steps, with the possibility of elimination at each step. These sequential steps were as follows: a) agree to be tested for HIV, b) come back to a clinic for the results, and c) be invited to participate in the study if found to be HIV positive, d) agree to participate in the larger study, and e) agree to participate in my study. The reality in Hlabisa, as in many other parts of sub-Saharan Africa, is that many women chose not to test for HIV and, even if they were tested, they chose not to know their status. Added to this is the social stigma of participating in a study that clearly became identified as an “HIV study” in spite of the investigators efforts to present it to the community as an infant health and wellbeing study. This warrants caution in generalizing the results of the study to the general population of HIV positive mothers in Hlabisa.

The discovery that the HIV virus could be transmitted through breastmilk has

initiated a public health dilemma. As this knowledge has been disseminated from the scientific and public health sectors to communities where HIV/AIDS has become a reality of daily life, it has also created powerful personal dilemmas for women who are infected with the virus. In this ethnographic investigation in one such community, we have a glimpse of the forces that influence HIV positive women as they attempt to make an informed choice about feeding their infants.

The socio-cultural context in which women in rural Kwa-Zulu Natal make their decisions is one in which breastfeeding is highly valued. As in many areas of sub-Saharan Africa, breastfeeding here is culturally normative, and there is no evidence in this study to suggest that this fundamental health practice is being eroded. The women we interviewed know that breastmilk has the potential to infect their child with HIV, but a dominant theme in the women's discussions was that breastmilk protects children and is superior to formula. This is a reassuring finding. The in-depth, non-directive nature of the interview techniques that were used to obtain the data provides some confidence that the views the women were expressing reflected their beliefs. However, one must be very cautious in generalizing from a small, opportunistic sample to the larger community from which the sample was drawn. In particular, these women had a) agreed to be tested b) come back for their test results, and c) agreed to participate in the trial when they found out that they were HIV positive. It is the rare African woman who a) agrees to be tested for HIV b) comes back for her results and c) if she is HIV positive, agrees to participate in a trial which is clearly identified as an "HIV trial" within the community and risks disclosing her status to the community.

A striking finding in the study is the role of social stigma in affecting women's decisions. Social stigma may undermine women's willingness to participate in programs aimed at reducing mother to child transmission of HIV (which are

commonly referred to as PMTCT programs). This finding is consistent with other studies in sub-Saharan Africa in which women are reported to be concerned about enrolling in a program that exposes them to discrimination in the community (Botswana Program review team, 2002). Social stigma appears to be particularly acute for young women. This is also consistent with other reports from South Africa, which suggest that young people have a harder time accepting their status and are more likely to be in denial for a longer time compared to older adults (Campbell and MacPhail 2002; Eaton et al., 2003). When this situation is considered in light of the fact that in, South Africa, over 35% of women under 20 have been pregnant or have a child (Jewkes et al., 2001), and that over 21% of South African girls aged 16–18 years are HIV-positive (UNAIDS/WHO, 2004) the need for health care providers to be particularly attentive to the needs of young people cannot be over-emphasized.

The importance of hospital breastfeeding policy and attitudes of health personnel in affecting breastfeeding practices has been repeatedly documented (Weng et al., 2003, Knodel et al., 1990, Williamson 1990). The effect of pro-breastfeeding policies in situations of endemic HIV infection and high level of social stigma associated with the disease has not been adequately appreciated. In reality the Baby Friendly Hospital Initiative does not preclude the use of replacement feeding in situations that are medically indicated (WHO/UNICEF 1989). However, mothers need privacy and support for replacement feeding, on one hand to allow them to keep their HIV status confidential and on the other to prevent erosion of the breastfeeding policy of the hospital.

The difficulty of practicing exclusive breastfeeding in social conditions where family members do not understand its value is by no means limited to the situation of HIV positive women, and is likely to be most acute for young women. Adolescent mothers frequently noted that they received advice from their families to practice

mixed feeding. Although there is a paucity of data on how adolescent mothers in sub-Saharan Africa negotiate conflicting advice from their families and health care providers, it is likely that, as with adolescents everywhere, they may hesitate to contradict families' opinions regarding infant feeding, especially if they are financially and emotionally dependent upon them. As suggested by the ecological model reviewed in Chapter 2, younger mothers may lack "self efficacy" and, because they have less experience with infant feeding, they may lack confidence to successfully carry out their chosen method of infant feeding. Bentley et al. (1999), note that, because adolescents may be insecure about their own beliefs, they logically turn to their families, particularly their mothers and grandmothers, for help. Even when adolescent mothers express disagreement, families may insist on their own decisions or, less frequently, implement their preferred feeding practices without the mother's consent. Accommodating the family's wishes may be an adaptive coping strategy as adolescent mothers struggle with the enormous challenge of parenting in the midst of their own development.

Finally, we note the results concerning the effects of poverty in constraining women's decisions about how to feed their infants. Historically, under the apartheid regime in South Africa, Blacks have been deliberately excluded from access to land, capital, employment and education (Francis 2002). In present-day South Africa, the most pressing need for large numbers of Black people is obtaining employment. The recurrent theme in the interviews that formula feeding was not a viable option highlights the need to include the larger context of political and economic influences on individuals and their families in relation to the concept of "informed consent." In the long term, efforts to reduce the high levels of poverty and unemployment among Black South Africans may improve women's confidence and ability to direct their lives and take control of their health and that of their loved ones in ways that are

consistent with their hopes and aspirations (Campbell and MacPhail 2002).

Conclusion

Programs to prevent mother-to-child transmission in the Southern African region, and in other areas of high HIV infection, are struggling to support reproductively active women as they cope with their disease. Health staff and trained counselors are under severe time constraints to explain complex concepts such as relative risks and personal risk assessments. There is a danger that in this difficult environment, primary health practitioners advise mothers according to formal guidelines without being adequately aware of the mothers' preferences, skills and home circumstances. Health care programs and providers need to better understand mothers' social circumstances, their beliefs, motivations and behaviors, and be better prepared to intervene in ways that permit mothers to "hear" and respond. For example, because teenage mothers may have a harder time dealing with HIV-positive status, they may encounter more difficulties in safely implementing their chosen method of infant feeding compared to adult mothers. This implies that, in programs designed to prevent Mother-To-Child Transmission, all mothers should not be approached in the same way, rather, programs would segment the group with regard to age, and tailor the messages accordingly. Programs may also consider having "peer counselors" who can better relate to young HIV positive mothers and who would be able to counsel them in an understanding way.

The themes that emerged from the ethnographic study in Kwa-Zulu Natal may be important in other areas of sub-Saharan Africa where HIV-positive women have to make difficult choices in constrained circumstances. Apart from the specific thematic content, I have also sought to illustrate the importance of attention to the socio-cultural context of MTCT interventions. Efforts to modify infant feeding practices must do more than increase women's knowledge about current recommendations. By

examining the context within which feeding decisions are made, a better understanding of the multiple influences on feeding practices can be established. This is a necessary step toward the development of more effective programs to address the special needs of women and children in populations where HIV is an issue of public health importance.

CHAPTER 6

ROUTINE CARE OF THE NEWBORN IN PEMBAN HOUSEHOLDS: THE THEMATIC STUDY

Background

Virtually everywhere in the developing world the first weeks of life are seen as a time of danger, and families engage in activities to protect their neonates from harm or to manage perceived ill health in the newborn (Rice, 2000). In the matter of routine newborn care practices in homes and communities, there is a serious dearth of data worldwide. Tanzania, where the rate of neonatal mortality is estimated to be 43 per 1000 (Lawn et al, 2005), is no exception. To date, there has been little systematic investigation of newborn care-giving practices: mortality reduction programs, including the promotion of exclusive breastfeeding, are designed without the benefit of knowledge about the practices and their cultural rationales (Mull, 1992).

Understanding these behaviors and their rationale from the perspective of families is an essential first step to the design of effective programs to improve feeding practices and, in the long term, reduce neonatal deaths in populations that experience high rates of neonatal death.

Objectives of this study

This paper presents the results of an ethnographic study conducted in the Pemba Island of Tanzania. The primary objective of the study was to understand newborn care-giving behaviors and their cultural rationale. The study does not focus exclusively on infant feeding. Rather, feeding behaviors are examined within the larger context of beliefs and practices related to the care of newborns in the community. The next chapter, Chapter 7, explores local conceptualizations of infant feeding in relation to other aspects of care and examines the implications of the findings for the design of interventions. The following chapter, Chapter 8, presents

the results of the next step that needs to be taken to provide guidance for program development, and which was inspired by the “Trial of Improved Practices.”

For the study of newborn care practices reported here, ethnographic interviews were conducted with two small samples of mothers. The results are presented here in the form of thematic (text) analysis of the interviews with the women.

Research setting

The two major islands that lie off the east coast of mainland Tanzania are commonly referred to as the Zanzibar islands. Of the two, Pemba Island is the most northern, the smallest, and the least well known. Unguja is the most southern, the largest, and is the one which is generally referred to as Zanzibar. Pemba is approximately 60 by 20 kilometers in size (see map in figure 6.1 below). The island has a population of about 300,000 people.



Figure 6.1: Map of the two Zanzibar islands (Pemba and Unguja)

In the following section, I present background information about the political history and contemporary social conditions in Pemba. This information is taken from a number of sources, including the lay literature, published and peer-reviewed articles, and unpublished manuscripts. The purpose of the discussion is to provide readers with an overview of the broad social and ethnographic context within which my study was conducted.

1) History

According to the US Department of State (2003), politically, Pemba has strong ties with Oman—the Omani sultanate ruled Pemba and Unguja from the early 18th Century. The height of Omani rule came during the reign of Sultan Seyyid Said, who encouraged the development of clove plantations, using the island's slave labor. By 1840, Said had transferred his capital from Muscat to Unguja and established a ruling Arab elite. In 1890 Unguja and Pemba were declared a British protectorate. British rule, enforced through a Sultan, remained largely unchanged from the late 19th century until after World War II.

According to the Library Reference Search (2004), in 1963, the Zanzibar islands received independence from the United Kingdom, but they still remained a constitutional monarchy under the sultan. Less than a month after independence from the British, the African majority revolted against the sultan and created a new government. This is commonly known as “the revolution.” Shortly after, the Zanzibar islands united with Tanganyika to form the United Republic of Tanzania. For administrative purposes, Tanzania was divided into 26 regions—21 on the mainland, 3 on Unguja, and 2 on Pemba. The Tanzania government controls issues related to foreign affairs, higher education, defense, the police, the currency and communication, the government of Zanzibar, retained considerable local autonomy. It controls the internal affairs of the two islands; it has its own president, parliament and

judiciary; and a number of ministries (such as the Ministry of Health) are autonomous from the rest of the country.

According to a popular source (Reuters, 2005), the United Republic of Tanzania held its first “free and fair” multi-party elections in 1995. The second elections, held in October 2000, were marred by irregularities, and subsequent political violence claimed at least 23 lives in January 2001. Most of these deaths were on Pemba Island, a stronghold of the main opposition party (the Civic United Front). The violence resulted in widespread resentment of Chama Cha Mapinduzi (CCM), the party that has held power nationally and on Zanzibar for almost 40 years.

Reuters (2005), notes that being a stronghold of the opposition has led to Pemba’s political and economic isolation from the rest of the country and that, although the larger Zanzibari island (Unguja) continues to receive income from tourism, the former Omani colony remains an underdeveloped and neglected corner of Tanzania, prompting accusations of an unequal distribution of resources between the mainland and the islands. Reuters (2005) notes that most Pembans attribute the difficulties in their lives to the political tensions, they feel that they are harassed and restricted, lacking freedom to conduct their daily lives, having few opportunities to pursue higher education, and generally benefiting from few of the country’s resources.

2) Culture

According to a popular guidebook (Lonely Planet, 2005) reflecting long historical ties with the Muslim world, as with the rest of the Zanzibar islands, more than 99% of Pembans are Muslim. The Arab influence on the islands is also evident in the people, who are a mix of “Shiraz” from Persia, Arabs (from Oman), migrants from the nearby Comoro islands, and Bantu people from mainland Tanzania. Indians and Europeans tend to be latter arrivals to the islands, and they constitute a minority.

The main language spoken on the Zanzibar islands is “Kiswahili.” The language is predominantly of Bantu (African) origin. As a result of close interactions with the Arab world, it has borrowed many words from Arabic. In his “History of the Swahili Language” Hassan (2005) provides the following examples of words that are derived from Arabic: “sita” meaning “six”, “saba” meaning “seven” and “tisa” meaning “nine.” As a result of British influence, Kiswahili also borrowed words from English. Hassan (2005), provides examples of words derived from the English language such as: “baiskeli” (bicycle), “basi’ (bus), and “penseli” (pencil). In this author’s view, the Swahili language continues to keep up with modern times, integrating words such as: “kampuni” (commercial company) and “kompyuta” (computer).

3) Education

According to the CIA (CIA, 2001), the official language spoken in Tanzania is Kiswahili. Tanzanians learn Kiswahili as their first language and, when they attend primary-school, they learn English as a second language, while Kiswahili is the language of instruction. It is only in secondary school that English becomes the language of instruction. As with the rest of the country, because of the strong Arab influence, Arabic is taught in all the government schools. The CIA notes that sixty to eighty percent of the Tanzania population aged 15 and above can read and write Kiswahili, English or Arabic.

According to Nassor and Mohamed (1998), since independence, the government has provided free education for all and, in 1992, education became compulsory for all children and young adults aged 7-16 years. At present, students attend primary school for 7 years, followed by 3 years of secondary school, 2 years of “senior” secondary school, and finally 2 years of higher secondary school. At the end of the “higher” secondary school, students are eligible for university education. In

addition to attending formal pre-primary schools that are funded by the government, Nassor and Mohamed (1998) explain that although it is not compulsory to do so, most children over 4 years of age attend Koranic schools. The authors estimate that, in the Zanzibar islands, enrolment in primary school approaches 80%, and that both boys and girls are represented in equal proportions. However, by the time students reach “senior” secondary school, there are significantly more boys than girls enrolled.

While providing education free of charge has allowed many Tanzanians access to basic education, schools remain grossly understaffed. In their study investigating primary school education in the Zanzibar islands, Nassor and Mohamed (1998) estimated that the student-teacher ratio was 35:1 on average. They also described the few resources which were available to students as follows:

“The teaching conditions in the schools were very poor...indeed these results suggested that crisis conditions existed in Zanzibar’s primary schools. There was a severe lack of classroom libraries, dictionaries for teachers in Kiswahili [which is the main language of instruction in primary schools], cupboards, bookshelves and even a teacher table. Most children did not have a textbook, a notebook, a ruler or an eraser. More pupils had pencils or ballpoint pens, but there was still a considerable number without either, which indicated that they had nothing with which to write.”

The authors noted that even in comparison with the rest of the two islands, Northern and Southern Pemba had the least resources available to them.

4) Employment and economic activities

With a reputation as a “spice island,” Pemba is the center of Tanzania’s clove industry. A number of other spices, including cardamom, cinnamon, nutmeg, black pepper, turmeric and vanilla, are also grown in the island. Most of the owners of the larger clove and other spice plantations are of Arab-Omani descent (Ellman, 2004). Cloves constitute an important part of rural Zanzibari lives, particularly on Pemba.

The clove appears on Zanzibar's flag and all official emblems and letterheads (Tschida, 2004). In recent years, however, the clove industry has declined, contributing to growing poverty in the island (Ellman, 2004). This decline is due in part to competition from other countries, and in part to the mismanagement of the clove industry by the Zanzibar State Trading Corporation.

The crops grown in Pemba include coconut, cassava, groundnuts, banana, sweet potato, rice, corn, millet, tomatoes, okra, pumpkin, eggplant, spinach, beans and peppers (Tschida, 2004). Because communications within Pemba and with the outside world are poor, access to markets for agricultural products is a severe constraint to economic development (Ellman, 2004). Additionally, while the volume of all major crops may have increased over the past few years, large amounts of produce never reach the market, and poor pricing and unreliable cash flow to farmers continue to frustrate the Pemban agricultural sector (Ellman, 2004).

As with other places around the world where coconuts constitute the “tree of life” the coconut tree has many uses in Zanzibar. According to Krain et al. (2002), these include but are not limited to: a) using the white meat for flavoring dishes; b) using the husks as charcoal; c) soaking the hairy husk in salty water until it is soft enough to spin into a strong, durable rope; d) using the fronds of the coconut palm to weave baskets, brooms and mats; e) using coconut palm leaves to weave roofs for thatching a home; f) boiling coconut tree roots to makes dyes for coloring the fronds use to make mats g) using coconut oil for massage or as a lotion for the body h) using coconut shells as cooking utensils such as bowls or ladles.

Fishing is another important economic activity in Pemba and it provides an important source of food. As Tschida (2004), describes this activity:

“*Dagaa*” (small sardine-like fish) which are often caught in large dragnets are plentiful on the island. Other larger fish are generally

caught with spearfishing techniques from traditional wooden dugout outrigger canoes called “*ngawalas*” or larger traditional sail-driven crafts called “*dhows*. ” Fishing in the ocean is perceived to be dangerous and is believed to be the cause of many deaths each year. Fishing is generally viewed as a male occupation, but on occasion, women fish with nets from the “*ngawalas*. ”

Tschida notes that women and children also collect a variety of seafoods, including clams, when the tide is low and when they can wade out into the sea. Pembans who are not engaged in fishing or farming find employment working for the government in the local health dispensary, the elementary or secondary schools, or the local police stations while others are involved in small service or merchant businesses, such as bicycle or shoe repair, shop keeping or taxi driving.

5) Food and nutrition

As Tschida (2004) notes, fish and seafood such as octopus, clams and mussels are an important source of food for many families in Pemba. She notes that *dagaa* are available throughout the year, and they can be bought relatively cheaply—for this reason, they are often consumed by families in the lower-socio-economic groups.

Many Pemban families also keep chickens, goats, cattle and, to a lesser extent, guinea-fowl (Tschida, 2004). In this author’s view, one of the common breeds of cattle kept in Pemba is the “zebu” cattle. As described in Wikipedia, a free online encyclopedia, the zebu (*Bos taurus*) is a humped cattle that tends to be well adapted to tropical climates. These animals originated from India over 10,000 years ago, and were imported to the East coast of Africa. Because zebras can handle hot, humid climates well, and because they are resistant to pests in these environments, they have survived well. Zebu, however, are a poor source of meat and milk. It could be for this reason that, in Pemba (as in India where they originated), zebu are often used as a

mode of transportation. In contrast, other breeds, commonly referred to as “ng’ombe chotara” (cross breed cows) are used to produce milk and meat.

According to Tschida (2004), mangoes, papaya and coconut are generally grown in small scale farms in the island while other fruits are mostly collected by children and are often consumed away from home. She notes that other foods such as rice, bread and flour are often purchased from small neighborhood shops which rarely have fresh produce. From this author’s observation, Pembans often buy small quantities of fresh food daily from the local market, in part because they do not have the resources which would allow them to purchase large quantities, and in part because they often do not have refrigerators to store large quantities of fresh food at home.

6) Key features of Pemban households

According to Tschida (2004), in Pemba, very few rural houses have their own taps. In most households, women have to walk for long distances to fetch water from a communal tap or from a fresh water well. This water is then used for drinking, cooking, bathing. When rural women need to wash clothes, they either wash them at the communal well, or they take them to the stream. Tschida (2004) explains, that, in addition to fetching water, women are also responsible for collecting firewood, cooking, and for taking care of their children. Sometimes, if a woman has an older female child, the girl may help her with some of these household tasks, and especially

in taking care of younger siblings. Nassor and Mohamed (1998) have suggested that the drop-off of girls at the secondary school level may be a result of household responsibilities which leave them little time to devote to their education.

Men are often the heads of Pemban households (FMSP project, 200x⁴). While domestic chores and subsistence farming are seen to be women's tasks, men are expected to fish, to participate in cash crop production, and to participate in religious activities (Donley-Reid, 1990). An analysis of coastal communities in Tanzania and Mozambique (Golder and MacDonald, 2002) found that, as the main household breadwinners, men control access to almost all resources and that "husbands are generally responsible for meeting the cash requirements of the family but women contribute to school fees and medical expenses."

Polygamy is permitted under Muslim law and men can take up to four wives at any one time (Tschida, 2004), but increasingly, as the cost of living rises, only a few wealthier men are able to take responsibility for more than one spouse (FMSP project, 200x). As with other coastal regions, and in contrast to other regions of Tanzania, there is a high rate of divorce and re-marriage in Pemba, and women tend to reside in a number of villages over the course of their marital life (FMSP project, 200x).

⁴ This report was submitted to the DFID and does not have a year of publication

7) Health care and health seeking in Pemba

1. Health problems

According to Stoltzfus et al. (2003), malaria is the leading cause of death in the island. Among the most vulnerable groups are young children because they have not yet developed the partial immunity that protects others in the same community. Pemba is also characterized by intense transmission of parasitic infections, such as geohelminths (Stoltzfus et al., 1997).

2. Health care provision

In Pemba, as in most of Tanzania where there is approximately one doctor for every 20,000 inhabitants, modern medical health care is a luxury. There is a paucity of trained health care workers to serve the Pemban population. There are 56 Primary Health Care Units in Pemba Island; 2 Primary Health Care Centres (PHCCs) and 3 hospitals with a bed capacity of between 80 and 100 beds (Mbelle and Joviter, 2003). In all facilities, however, patients often need to bring their own syringes if they need injections, and drugs are often in short supply and need to be purchased from shop-keepers in the marketplaces (Tschida, 2004).

3. Health seeking behavior

As is common in most parts of the developing world, the larger health system in Pemba is compromised of many different components, representing different medical traditions and resources. These resources include formally trained physicians and nurses, and local healers, including herbalists, spiritual healers, diviners and traditional birth attendants. When individuals are thought to be very ill, they usually by-pass the local dispensary and seek treatment either from traditional healers or travel to one of the three hospitals (Tschida, 2004).

4. Health care during birth and the early postpartum period

According to Mamdani and Bangser (2004), in Tanzania, as in other countries in sub-Saharan Africa, the health sector has been slowly deteriorating since the 1980s. Now, there are few well trained health workers to serve the population, and those who remain are frustrated by low salaries, run-down buildings, corruption, and poor staff management. Mamdani and Bangser note that health care workers are not the only ones who are dissatisfied with the situation. Patients also complain about harassment from health care providers, and especially “discrimination” of those who are poor; lack of drugs and other essentials at health care facilities; and difficulty in accessing health care services. Pemba is no exception. In a UNICEF report, Lees-Mlanga (1998), notes that Pemban women generally prefer to give birth at home (about 2/3 of births take place at home), in part because of health service access problems (e.g. lack of transport and cost of health care) and in part because of social factors. For example, women complain that they are treated in a humiliating way by health care providers, that some hospitals are “dirty” because they lack water (only about 75% of the island has running water), and some facilities lack basic equipment, including gloves, plastic sheets and syringes. Pemban women generally prefer to deliver in their homes with the help of a traditional birth attendant. In addition to help with delivery, these attendants may provide advice for family planning, help in household chores, bury the placenta, give traditional medicines for pain, massage both mother and child, and even check on the child during the first week after delivery.

The brief description of the maternity ward at Wete hospital, the main hospital in the Northern district of Pemba (see Vignette 6.1) provides a snap shot of the conditions women have to endure during delivery at the hospital. Perhaps negative experiences such as these contribute to a reluctance to deliver at the hospital.

Vignette 6.1

There is often no running water inside the Wete maternity ward. Sometimes, there is water in a small room that the nurses use as a washroom. If a patient needs water, she has to fetch it from taps situated 3-5 minutes walk outside of the ward. In addition to problems accessing water, although a woman sometimes gets tea and *mandazi* (East African doughnuts) provided by the hospital, she is not provided with meals. Her family has to bring her home-made meals a few times during the day. This does not pose much of a problem for mothers who live close to the hospital, however, for those who travel long distances to get to there, meals are an additional hassle.

Although medical consultations are provided free of charge, medication, and small items such as gauze, disinfectant and gloves that need to be purchased by the woman herself. Additionally, because there is no blood bank available at the hospital, a woman who needs transfusion needs to come with her own (potential) donors. If these are found not to be acceptable (e.g. if they are HIV infected or if blood groups are not compatible), she needs to send someone to the mosque on her behalf, and ask those attending the mosque if they are willing to donate blood. Because people are increasingly reluctant to be tested for HIV prior to donating blood, it is increasingly difficult for women to locate potential donors.

It is for these reasons that women rarely travel to the hospital unaccompanied. They often bring their family members to ‘assist’ them when they hospitalized. These family members bring food, water, purchase medicines and donate blood as needed. The family members often sit on the terrace of an empty building opposite the maternity ward. They get bored waiting for the woman to deliver. They sleep, chat with each other, and generally try to kill time as they wait for their relative. Every once in a while, these family members, often the woman’s husband or her female relatives (e.g. mother, grandmother, aunt), come inside the ward to check on her and to see if she needs anything. Sometimes, if the woman is in critical condition, for example, if she has a severe case of pre-eclampsia, family members come to watch over her inside the ward, and try to attract the nurse’s attention so that their relative can be attended to.

8) Description of the two Pemba sites (rural and peri-urban) in which the study was conducted

*a) Peri-urban site (*Chasasa*)*

For an outsider and a foreigner who is not well acquainted with Pemba, Chasasa appears to be a large, sprawling “slum” located a few minutes drive from Wete. The houses are built close together, sometimes only a few meters separate one house from

the other. Most houses look the same: they have mud walls and thatched roofs. A few of the houses—probably those belong to the better-off families—have cemented walls and roofs made of corrugated iron. Sometimes, one sees a “vespar” (scooter) parked out of these households that appeared to be better off.

It is difficult for an outsider to find his way in Chasasa, especially because the houses are built close together, there are no large “paths” separating one row of houses from the other, and the houses look much the same. I needed the help of the research assistant to weave my way around the suburb and, when interviewing was over, to find the “daladala” (public transportation) stop! When we first began conducting interviews in women’s homes, we would pass in front of a house and the research assistant would ask: ‘do you remember we interviewed someone there?’ I would look at her blankly, because I honestly could not differentiate the houses. Perhaps the one house I could always remember was the traditional birth attendant’s house: it was set apart from the other houses, and it was directly opposite a shop. Incidentally, the TBA was also a very entertaining respondent, and I often enjoyed interviews with her.

The typical Chasasa house, as is the case with most houses in Pemba, is square in shape. With a few exceptions, the typical Chasasa house has no garden or a large “space” separating one property from the other. Most of the houses have a ‘baraza’ built in front of, or all around the house. A baraza is a small terrace that is about 20 inches wide, and about 20 inches high. One can either sit on it, with one’s back touching the wall or, because it is long, one can lie on it. People often sit or lie down on their own baraza, chatting with neighbors sitting opposite them or greeting passersby, especially during the late afternoon or early in the evening. When a baraza is close to a shop or to a “daladala” stop, people who do not live in the house may sit on the baraza. But, if sitting on someone else’s baraza, the polite thing to do is to

knock on the homeowner's door, greet them, and ask them if you can use their baraza.

I often did this with my research assistant while waiting for a "daladala."

On getting better acquainted with Chasasa, and after being able to find one's way around and identifying informants' houses, one begins to get a "feel" of what it is like to live in Chasasa. I found Chasasa to be composed of a vibrant community of people, most of whom are related to each other in one way or another. Some families, especially those that appear better off, generally have a family member who brings in a regular income, perhaps a shop keeper, nurse, teacher, mechanic or policeman. Other families have a fisherman in the household, a petty trader, or a traditional healer (mganga) or a traditional birth attendant who contributes to the household's income. As all our interviews took place in people's houses, I was able to get a "feel" of what the typical Chasasa house looks like inside. Vignette 6.2 below describes the interior of a typical house that appeared to be poor and its occupants. Vignette 6.3 that follows describes a house that appeared to be "better off" and its occupants.

Vignette 6.2: Description of a typical “better off” Chasasa house and its occupants

This household belonged to a mganga (traditional healer). He was a skinny man aged about 70. His wife, a traditional birth attendant, also seemed to be all skin and bones. In my opinion, she did not weigh more than 35 kilos. Both were really short. When I asked the research assistant if it was usual practice for TBAs to be married to a “mganga” she noted that most older women in Pemba regard themselves as being TBAs, whether or not they have been trained for the job. If they help a mother deliver, they often get gifts such as khangas (traditional East African cloth) or even up to 5000 Tanzanian shillings (equivalent to 5 dollars).

My overall impression of the house in which we were interviewing was that they were really poor. From the outside, the house seemed like any other Chasasa house: it was square, it had mud walls, a thatched roof, and a cement baraza all around. Once inside, however, one quickly realized that the house was only half finished; there were no doors separating one room from the other, and some of the interior walls were falling apart such that one could see the wooden rods on which the mud once rested. The house was untidy all around, there were cooking pots strewn all over the courtyard, the mats were not laid out neatly on the floor or stacked on the side of the wall as in most of the other houses. This household appeared to be very poor, even in comparison to households in the more rural areas.

Vignette 6.3: Description of a typical “better off” Chasasa house and its occupants

This house belonged to a young attractive woman in her mid-thirties. She was employed in the ministry of agriculture. In contrast to most houses, where people often sit on mats, this house had two sofas for people to sit on in the living room. In contrast to houses belonging to wealthy Pembans, this house did not have metal bars on the windows and on the doors, or a stone wall enclosing the land on which the house was built. However, for Chasasa, it was one of the nicer houses I visited.

While interviewing the respondent, I noted (and was surprised) by what three people sitting inside the house were eating. One of these three was a man in his thirties (who I later found out was her husband), the second was a man in his sixties and the third was a little girl aged about 2 (her daughter). The two men sat on a woven mat on the floor and ate together in a large plate. On this plate, there was a sauce with fish and tomatoes, rice and beans, and mchicha. The little girl also had her own plate with a small amount of the three items, she would eat and, every once in a while, sit near her father who would put out some more food for her.

The reason why the food that the three were eating was a surprise was because, in most of the houses I visited, if people were eating, it would only be a simple meal of cassava accompanied by a few pieces of fish, and washed down with spiced, sweetened black tea. In the Chasasa households I had visited, I hadn’t seen people eating vegetables or tomatoes. In other households where I had seen people eating, children often ate together with adults from one large plate. In this case, the children are often reminded not to ‘disturb the adults as they eat and particularly not to grab what is in the middle of the plate (often the fish). If there were many children, these would eat together from one large plate, and the adults from a separate one. In contrast, in this house, I found it surprising that the little girl was eating from her own plate.

I suspected that the woman supported the family with her income, in part because, if her husband was also employed, he wouldn’t have hanged around us as we talked, and in part because most employed men do not come back home for lunch.

b) Rural site (Vitongoji)

It costs about 200 Tanzania shillings (equivalent of 25 US cents) to travel from the town of Chake Chake to the village of Vitongoji. The trip itself takes only about half an hour, but one wastes a lot of time waiting for a daladala and, once in Vitongoji , there is no transportation within the village, this requires a lot of walking from one household cluster to another.

There are distinct “clusters” of households within the village. Because there is no public transport within the village, it often took us about 20 minutes to walk from one cluster to the other. But I found these walks to be relatively pleasant: we would pass by various trees, including clove trees, guava trees, coconut, banana, grapefruit, pawpaw and some others I couldn’t identify. The interviewers also helped me identify cassava and ground nuts, two crops which are often grown in the area. As we walked, we would see children climbing up the trees to get fruit. Sometimes, we would find children who were selling the fruit they had collected by the roadside which we would ask them to sell to us.

In contrast to Chasasa where some participate in formal employment, few are formally employed in Vitongoji. Some young men help people carry heavy loads (mizigo) for which they are paid a small amount. Others fish or depend on farming. A few of those who are better off participate in petty trade, such as selling fruit and vegetables or preparing home-made juices for sale.

As with most Pemban houses, Vitongoji houses are square in shape. In contrast to Chasasa where houses are built closely together, Vitongoji houses are less close, and there is sometimes a garden separating one household from the other. Almost all of the houses had mud walls, they were square in shape, and they had thatched roofs. This suggests that there were relatively little differences in wealth. Vignette 6.4 that follows describes the interior of a typical house and its occupants.

Vignette 6.4: Description of a typical Vitongoji house and its occupants

This house belonged to a woman in her mid-thirties. Both she and her husband were not formally employed. Her husband obtained his income by repairing bicycles, which are often used as a form of transportation in the village.

As with other houses, the house had mud walls, a thatched roof and a baraza all around it. On our first visit, we noted that her house was very clean: although the floor was made of compacted mud, it was cleanly swept, and the brightly colored mats were neatly folded in one corner of the living room. There were three doors leading off the living room, which we found out to be bedrooms in subsequent visits, and a hallway leading to an outside, enclosed courtyard. The kitchen was located within the courtyard, its door facing the hallway.

There was a communal tap located near the house. These taps were recently installed in various places around the village. Our respondent was lucky to have one located so close. Sometimes, when people came to fetch water from the tap (the water was free), they would often drop in to say “hello.”

On our first and second visits, the respondent pulled out mats for us to sit on in the living room. As we interviewed her, her youngest child would sometimes come and tug at her dress, probably wondering who these strangers were. Then she would spot a chicken wandering into the living room from the courtyard, and would “shoo” it away.

On our third visit, we conducted the postpartum interview in the respondent’s bedroom. This was because, as with many other Pemban women, following delivery, she was sitting on a traditional bed (*kitanda cha babu*) under which hot coals had been placed on a metal recipient. A “*kitanda cha babu*” is a very simple rectangular frame mounted on four short legs. A strong rope woven through the frame serves as a bed spring. Traditionally, following delivery, women sit on the bed which is heated using hot coals placed underneath. People believe that the practice “allows the woman to dry up faster” or that it allows her to “regain her health quickly.”

Research methods for this study

As the purpose of this study was to develop an emic description of newborn care, the methods that were used for data collection and analysis were drawn from ethnographic approaches. As discussed in Chapter 4, at the most basic level, “describing a culture” necessitates discovering shared patterns of behavior and thought that give some coherence to the topic of interest. Ethnography attempts to detect

common patterns within a culture, while recognizing that this does not rule out variation within the culture (Schweizer, 1998). Typically, the ethnographic approach puts the members of a culture into center-stage, and conveys their feelings, insights and experiences as closely as possible.

With the exception of the free-listing exercise, for which a sample size of 10-12 is considered appropriate (Weller and Romney, 1988), generally, for open-ended interviews, there are no rules for sample size requirements (Patton, 1990). With the same fixed resources and limited time, one could study a large number of people, and obtain more breadth, or one could study a smaller number of people, and obtain more depth. In this study, the second approach was chosen: obtaining in-depth information from a smaller group of respondents. Diverse experiences across a wide range of cultural situations suggests that about 30 respondents are adequate to achieve saturation—the point at which no new information is forthcoming from interviewing new respondents (Pelto, personal communication).

1) Data collection

Drawing from two Pemban samples, the research reported in this chapter answers two specific research questions:

- a) What are the beliefs and motivations for routine care-giving practices for newborns in Pemba?
- b) What are the specific beliefs associated with newborn feeding practices?

Interviews with the first sample of women answer both research questions, while interviews with the second sample of women are directed only to the second question.

All interviews were conducted in Kiswahili. The dialect that is spoken on Pemba is sufficiently similar to the Kiswahili that is my mother tongue that I was able to converse easily with respondents. However, I did have local research assistants,

who were particularly helpful in introducing me to families and in facilitating my entry into respondents' homes.

2) Selection of the two samples

The first sample was interviewed from August to October 2003. Mothers who had recently delivered were recruited from one peri-urban community (Chasasa) in the Northern district of Pemba Island. The community was selected because it was relatively accessible from the main town in the Northern district of the Island (Wete). To be eligible to participate mothers had to have an infant less than 40 days old (the local culturally "emic" or "insider" definition of a newborn). Mothers also had to be in "ujusi" (the local term used to refer to the postpartum period when the mother is "secluded" away from the rest of the society, this period lasts for as long as the mother experiences postpartum bleeding). The third criteria was to be literate (required for pile sorting).

To ensure comparability of content across respondents, structured ethnographic interviews were used to explore cultural beliefs and motivations for 34 common care-giving practices identified through informal discussions with key informants (including traditional birth attendants, traditional healers and nurses at Wete hospital) prior to the main study (data not presented). Brief descriptions of these practices were written on index cards in Kiswahili. Examples of these descriptions include: *give birth at home; give birth in hospital; vaccinate baby; massage baby with coconut oil; expose baby to smoke obtained from burning Swahili medicine; give baby biscuits; give baby powder milk; give baby water; give baby cow's milk* (see appendix 6.1a for a full list of the practices in English, and appendix 6.1b for the same list in Kiswahili). For each practice, we asked mothers: "in your own opinion, why do people around here [item written on card]? For example: "in your own opinion, why do people around here give birth at home?" English translations of all the questions we asked

are outlined in appendix 6.2a, the Kiswahili version can be found in appendix 6.2b.

The second sample was interviewed from December 2004-February 2005. Women were recruited from one rural community in the Southern district of Pemba (Vitongoji). To be eligible to participate, women had to be in their last weeks of pregnancy and to intend to spend postpartum seclusion in the area. The community was selected because it is easily accessible from the major town in this district (Chake Chake); and because it is mostly agricultural, as is much of Pemba. The area is very poor, and most people depend on subsistence farming (groundnuts and cassava are the main crops grown). According to a previous census, the community has a population of 5916 individuals (Government of Tanzania, 2002). Because women tend to have 5-8 children during the course of their reproductive lives, households are generally large. The average household size is 5.7 (Government of Tanzania, 2002).

To ensure comparability of content across respondents, the interviews concerning cultural beliefs and motivations for giving foods, liquids and other substances to the child were conducted with the aid of a list of specific items. The list consisted of the following: *dill water*⁵; *water mixed with glucose*; *plain water*; *infant formula*; *breastmilk*; *cow's milk*; *shubili*⁶; *dates*; *honey*; *biscuits*; *tea*⁷; *tonga, vichukio*

⁵ This water is commercially made. It is bought in small bottles and is often packaged in the same way as industrially made medicinal syrups. Directions on the package indicate that the water is destined to relieve colic. But in Pemba, middle class mothers also use this when the baby is perceived to be having stomach problems; when the baby cries; or to relieve gas after the baby eats.

⁶ Herbal mixture made from aloe. When given to the newborn as a prelacteal feed, its "bitter taste" informs him that "life can be bitter."

⁷ Depending on what she has available, the mother prepares the tea with milk and/or sugar

*and kachiri*⁸; porridge made of corn flour. The items were represented as pictures drawn on index cards by a local artist, and pre-tested for relevance in a group of Pemban mothers. Short descriptions were also included above each picture (this allowed us to find out if mothers could read). See appendix 6.3a for an English translation of the questions asked, and appendix 6.3b for the Kiswahili version.

3) Interview procedures

In interviews with both samples, the bulk of the interview time was devoted to discussion facilitated by the index cards. We began by shuffling the cards, and showing them, one by one, to a respondent. One advantage of using cards was that, if a mother was unable to respond to a particular stimulus or seemed hesitant at any time, we could easily skip that item and later come back to it, making the interviewing process flexible and adjusting the pace to the mother's preference. For each card we asked: "in your own opinion, why do people around here do the following [concept written on the card]?" For example, we asked, "in your own opinion, why do people around here give babies biscuits?"

The study was approved by the Cornell University Institutional Review Board, and by the Zanzibar Ministry of Health. Informed consent was obtained from all the individuals who participated in the study.

⁸ Traditional medicines obtained by boiling herbs with water and giving the mixture to the newborn.

4) Data analysis

All interviews were tape-recorded and transcribed using standards required for conversation analysis, which includes notation of hesitations, pauses in conversation and laughter (Seale and Silverman 1997). The text retrieval software (NUD*IST), was used to code the text (QSR, 2002). To start, any text concerning infant feeding was extracted, and coding was done at several levels, beginning with broad descriptive coding (e.g. “traditional medicine”), followed by more refined coding as the text analysis progressed (e.g. “*tonga* relieves stomach pains”).

The next step in the analysis was to compare interview content across respondents. Although the coding system made it easy to compare responses to the specific cards, this analytic approach failed to capture the context of the statements, which were important for understanding their meaning. I therefore turned to a different type of analysis in which I searched for themes that appeared in more than one interview. For each theme, the context of the statement and characteristics of the respondent were noted in order to build a fuller description.

Results

The findings from the study are presented here in terms of “themes” related to the women’s beliefs about and motivations for routine care of newborns observed in Pemba. Where tables are utilized to further expand a given theme, and to report knowledge, beliefs and attitudes, the number of women who mention a belief out of the total sample is indicated. This provides an indication of the extent to which the belief is widespread. For example, a belief generated by 13 of the 13 peri-urban respondents can be considered pervasive, compared to a belief mentioned by only one or two respondents. In addition, a mother can mention more than one belief, for example, as shown in table 6.2 that follows, in relation to home deliveries a mother can note that “things can go wrong that the TBA can’t take care of” and also that “you

can get better care at the hospital compared to the home.”

1) Characteristics of the participants

The mean age of respondents in both the peri-urban and the rural samples was 30, with ranges of 23-41 and 18-40 respectively. None of the peri-urban women were under 20; however, 10% of the rural women were under 20. All the women were Muslim, and were from the Swahili ethnic group. Women in the peri-urban sample were interviewed 27 days after delivery (on average), while women in the rural sample were interviewed during pregnancy. The peri-urban sample is better off in terms of indicators of socio-economic status compared to the rural sample. For example, peri-urban women had a higher level of education (94% had been to secondary school vs 8%); a higher percentage of the sample delivered at the hospital (62% vs 54%); and a higher percentage were in monogamous relationships (85% vs 63%). With regard to the type of relationship and the socio-economic status, we had expected that women in households with a higher income were more likely to be in polygamous relationships. However field work suggested that, for the same household income, the nature of the relationship depended on whether the woman made a major contribution to household income. We noted that women who made major contributions to household income were less likely to be in a polygamous relationship, probably because they were more assertive and could negotiate a monogamous arrangement.

The sample characteristics are summarized in Table 6.1. The section that follows describes the broad outlines of beliefs and practices related to newborn care in Pemba. These descriptions are based on interviews with the 13 women from Chasasa which is located close to Wete town.

Table 6.1: Sample demographic characteristics

Characteristics		Peri-urban sample of mothers (N ₁ =13)	Rural sample of mothers (N ₂ =30)
Mean age of mothers in years (range)		30 (23-41)	30 (18-40)
Mean number of children (range)		4 (1-8)	5 (0-9)
% women who had 1 or more children die		Not asked	31%
Delivery with the help of skilled attendants at the hospital		62%	54%
Level of education	% no schooling	8%	50.0%
	% primary school	0%	42%
	% secondary school	92%	8%
Type of relationship	% monogamous	85%	63%
	% polygamous	15%	38%
Postpartum seclusion	Her natal home	99%	23%
	Her own home	1%	68%

Theme 1: Fear of death during delivery

A number of respondents noted that, for both for the mother and the baby, childbirth is a dangerous event. For this reason, informing relatives and friends about a safe birth was motivated by the desire to relieve them of worry. As one 40-year old peri-urban respondent explained:

“People are told that the mother has delivered because, if the mother is pregnant, our hearts are worried, we do not know how she is going to give birth, will she die? Will the baby die? [...] so immediately after [a mother] gives birth, people quickly come to see the mother and to congratulate her.”

In this peri-urban sample, most respondents felt that it was safer to give birth at the hospital compared to at home. Motivations for hospital delivery included the belief that unsafe practices—such as the use of unsterilized equipment—were prevalent during home births and that problems, such as hemorrhage, were more likely to occur. The same 40 year-old peri-urban mother quoted above described the disadvantages of giving birth at home in comparison to the hospital:

“When a baby is born at home, sometimes people use things like razors that have not been boiled, or if there is a problem which the traditional birth attendant [mkunga] does not understand, the mother can lose a lot of blood, and if she loses a lot of blood, there is no way to help her, but at the hospital, if you lose a lot of blood, the doctors can help you by giving you blood. But at home [...] is your mother going to give you blood?”

However, while recognizing the advantages of giving birth at the hospital, respondents identified various constraints to delivering there. These included: a) the cost of equipment required; b) fear of unnecessary c-sections and episiotomies; c) problems with transportation to the hospital, and d) negative psychological encounters with hospital personnel. As one 27 year-old peri-urban respondent described mothers' encounters with the doctors:

“[Mothers] are afraid, they think that doctors at the hospital are harsh, they snarl and show their teeth, the way dogs show their teeth to their enemies.”

Mothers' beliefs and perceptions about the constraints and motivations for delivering at the hospital are summarized in table 6.2 below.

Table 6.2: Mothers' perceptions about the constraints and motivations for delivering at the hospital versus the home.

	Mothers' perceptions	Number of women expressing belief*
Motivations for delivering at the hospital	“Things can go wrong at home” or “there are many problems at home that the TBA cannot take care of”	7 out of 13**
	“You can get better care at the hospital”	3 out of 13
Constraints to delivering at the hospital	“When the baby arrives, it is too late to go to hospital” or “traveling to the hospital is generally difficult”	3 out of 13
	“People just don’t like the hospital” (“They don’t like to get operations”) (“The doctors are harsh”)	3 out of 13 (2) (1)
	“The hospital lacks equipment, mothers have to buy everything, mothers have no money”	2 out of 13
	“Mothers can’t go to the hospital if they didn’t attend prenatal clinic”	1 out of 13

*The beliefs are not mutually exclusive, a mother can express more than one specific belief

**N₁=13 peri-urban motherse **N₁=13 peri-urban mothers

Theme 2: Perceived vulnerability of the newborn and its implications for parenting

As in many areas around the world, newborns are perceived as being very vulnerable and families engage in various practices to protect the vulnerable newborn. After birth, statements related to a newborn's vulnerability occurred in many of the interviews. In some interviews vulnerability as a theme was explicit; in others, it can be inferred from beliefs and practices. An example of an explicit statement is:

“We the Swahili, we say that when a baby is young, his blood is still young (damu changa), it has not settled, it needs to be saved from danger (uokosi)”

Newborns are perceived to be vulnerable to natural forces such as bad human intent and evil spirits. Informants described many newborn care-giving practices as actions to prevent unwanted outcomes in the vulnerable newborn or to manage

illnesses in newborns. In the section below, the preventive and curative actions are classified as follows: a) preventive actions that are supported by the biomedical theory of disease b) preventive actions that were couched by informants in biomedical terms, but that are not supported by the biomedical theory of disease prevention, c) actions that are meant to prevent outcomes that are of “traditional Swahili origin,” and d) “curative actions.”

1) Preventive actions that are supported by the biomedical theory of disease prevention

Actions to prevent unwanted outcomes that are supported by the biomedical theory of disease prevention included vaccination, sterilizing the razor used to cut the umbilical cord by boiling, and wrapping the baby in cloth to protect him from the cold.

With regard to vaccination, all 13 respondents described this practice as preventing or protecting the newborn from diseases. According to one 32-year old:

“A newborn is vaccinated to prevent him from getting diseases such as measles, polio, whooping cough and other types of diseases. We are told this at the hospital that is the reason why babies are vaccinated, for prevention.”

Vaccination was described by respondents as important to prevent measles, tetanus, polio, whooping cough and, less commonly, sore throat. Although respondents mentioned the importance of vaccinations in preventing various childhood diseases, and although expressed beliefs about the diseases that could be prevented, none of the newborns had been immunized at the time we visited them (2-32 days after delivery).

In the late 1990s, the Zanzibar Ministry of Health sought to improve birthing practices in Pemba. Behaviors encouraged included sterilizing the equipment used during delivery, and promoting hospital rather than home deliveries, particularly for

first time mothers. Now, it is common to buy razor blades from the local shops, boil the blades for sterilization, and use the sterilized blades to cut the umbilical cord during delivery. Given the context within which the practice of boiling razor blades used to cut the umbilical cord had evolved, in this study we were not surprised to find that respondents described sterilization as a preventive behavior. Eight out of the 13 respondents specifically mentioned that boiling the razor that is used to cut the umbilical cord prevents against tetanus. As one 40-year old respondent described the motivation:

“The razor used to cut the umbilical cord is boiled because the baby may get tetanus, that is the reason why the razor is boiled, you can prevent problems by doing this.”

Another behavior that was believed by respondents to be protective in nature, and that is supported by the biomedical theory of disease prevention is the practice of wrapping babies to prevent hypothermia. As one 32-year old respondent described the motivation for wrapping babies:

“The baby is wrapped so that he can keep warm, khangas (thin, rectangular cotton cloths that are often used in East Africa) are warm types of clothing, and the baby needs to be warm.”

Of the 13 respondents, 10 mentioned prevention from cold as the motivation for wrapping a baby. Less common motivations supported by the biomedical theory of disease prevention, include protection from dirt (n=1) and; protection from insects (n=1); while prevention against “the evil eye” (n=2) was a traditional belief.

2) Preventive actions that were couched by informants in biomedical terms, but that are not supported by the biomedical theory of disease

Although informants couched the rationale for other preventive behaviors in biomedical terms, the rationale for these behaviors is not biomedically supported.

These included avoiding strong smelling soaps and oils and massaging the baby with coconut oil. As one 32-year old respondent described the motivation for avoiding strong smelling soaps and oils:

A baby's nose cannot yet tolerate strong scents, this is why the baby's oil should not have a strong smell, if it is too strong, the baby will get the flu."

Of the diseases attributed to strong smells, 9 of 13 respondents noted “infections of the chest” which, translated from Kiswahili, include pneumonia, colds and the flu. One mentioned the possibility of getting fevers and one respondent mentioned the possibility of getting headaches.

Massage was also contextualized in biomedical terms, and was used for both preventive and therapeutic purposes. Seven respondents noted that massaging babies with coconut oil helps their limbs and joints to develop. This “development” was described as “joints not being stiff” “joints become relaxed and “joints become stronger.” As one 27-year old respondent described the motivation for massaging the baby with coconut oil:

A baby is massaged so that he develops; the baby's [joints] have not yet developed, each time the baby is massaged, his limbs become stronger."

Less common beliefs motivating the massage of babies with coconut oil included: warming the baby’s body (n=1); coconut oil helps the baby’s skin not to be dry (n=1) and “this is just a tradition” (n=1).

3) Preventive actions meant to prevent outcomes that are of “traditional Swahili origin”

Informants also explained that some of their care-giving actions could prevent unwanted outcomes that can be characterized as “traditional, Swahili in origin.”

These actions included applying kohl on the baby's face to disguise him so that people with "bad intentions" are unable to harm the baby; mixing traditional medicines into oil and rubbing this on the baby's skin; mixing water with traditional medicine and using it to wash the baby and; burying the placenta immediately after delivery. The section below describes mothers' motivations for their actions with regard to each of these preventive behaviors.

3-a) Applying kohl on the baby's face to disguise him so that people with evil intent are unable to harm the baby

A common belief in Pemba is that, because the newborn is vulnerable, he can be harmed by people's evil intentions. For example, people can look at the baby with envy and cause him harm; or they can sing praises about the baby, while in their hearts, they have evil intentions. For this reason, Pembans generally do not like to hear people say things such as "what a good looking baby, he looks just like his father" or "what a fat and healthy baby..." Of the 13 respondents, 10 mentioned that applying kohl on the baby's face "disguises" him, such that people are not able to see the baby and to "harm him." As one 40-year old respondent described the motivation for this practice:

"When the baby is born, when he is still young, kohl is applied to disguise his face, you disguise his face so that, if other people come inside your house during seclusion, they do not know what the baby's face looks like."

3-b) Massage and bathing the baby

Mothers in the study reported washing the baby twice a day (once in the morning, and once in the evening). The bath water should be heated in a cooking pot and, if it became too hot, the mother should cool it down with cold water. After washing the baby with soap and water, the mother should wipe him dry. She should

then apply oil onto her palms, “heat” her palms over the fire, and quickly massage the baby all over.

In addition to these routine baths and massages, in the first few weeks after birth, Pemban families sometimes consult a TBA from whom they purchase traditional medicine. This traditional medicine is commonly referred to as “*dawa za Waswahili*” or “*dawa za kienyeji*.” Some types of traditional medicine prescribed for the newborn should be mixed with water and the mixture used to bathe the baby while others should be mixed with oil and applied on the baby’s skin. The practice of mixing water with traditional medicine and using the mixture to wash the baby had a similar motivation as the practice of massaging the baby with oil+traditional medicine. One 32-year old respondent described the motivation:

“*Swahili medicine. We believe that when a baby is washed with this medicine, he is less likely to get diseases such as kijicho [the evil eye] and harm from people with evil intentions, it reduces the risk of mischief, that is why a baby is washed with Swahili medicine.*”

Mothers’ responses to the question: “In your own opinion, why do people mix the baby’s bath water with traditional medicine and use the mixture to wash the baby?” are summarized in table 6.3 below.

Table 6.3. Beliefs and motivations for washing a baby with traditional medicine

Beliefs and motivations	Number of women who expressed this belief*
Massaging a baby with traditional medicine protects the baby from the evil eye, from evil spirits or from disease	6 out of 13**
Massaging a baby with traditional medicine “helps the baby’s body to develop”	5 out of 13
Massaging a baby with traditional medicine is “just a tradition”	1 out of 13

*The beliefs are not mutually exclusive, a mother can express more than one specific belief

**N₁=13 peri-urban mothers

As one 27-year old respondent described the motivation for the practice of mixing traditional medicine with oil, and applying the mixture onto a baby's skin:

"They say that the young baby is appealing to evil spirits (mashetani) and to the supernatural (majini). I don't know what in the world those things are. Anyway, when oil mixed with traditional medicine is applied on the baby's skin, those things [evil spirits] encounter the bad smell of the oil, then it is not easy for them to harm the baby."

Interviewees' response to the questions: "in your own opinion, why do people mix oil with traditional medicine and use the mixture to massage the baby?" are summarized in table 6.4 below.

Table 6.4: Beliefs and motivations for massaging a baby with traditional medicine

Beliefs and motivations	Number of women who expressed this view*
Rubbing traditional medication onto the baby's skin "prevents the baby from evil," including spirits and intentions	4 out of 13**
Rubbing medication onto the baby's skin is "just something that people do, just a tradition."	2 out of 13
Rubbing oil onto the baby's skin "helps the baby's body develop"	1 out of 13
"For massage"	1 out of 13
"It helps the baby's skin become soft"	1 out of 13
No answer	1 out of 13

*These beliefs are not mutually exclusive, a mother can express more than one specific belief **N₁=13 peri-urban mothers

3-c) Burying the placenta immediately after delivery

Many women acknowledged the symbolic importance of ritual disposal of the placenta through burial. This traditional practice is reinforced by religious beliefs, which dictate that, because dogs are unclean animals, it is imperative to bury the placenta in such a way that it is not eaten by dogs. One respondent said: "*It is not good to throw the placenta away carelessly, anything can harm the baby. You see, when it lies there,*

carelessly, children may play with it if it is near the house, if it is elsewhere, like on the side of the road, a dog can dig it out of the ground and make it dirty. It is not good.”

Six respondents specifically mentioned the importance of burying the placenta to prevent it from being eaten by dogs. Other motivations for burying the placenta included “protecting it from spirits” (n=1); “it is not good to throw the placenta away carelessly” (n=1); and “the placenta is no longer needed” (n=1).

4) “Curative” actions

During childhood, diseases that do not respond to hospital medication are commonly known as “*homa za babu*.” These are diseases that are generally ascribed to non-biomedical causes and require traditional treatments. For example, in the more rural areas in Pemba, when hospital medication has been sought for an ill baby, and the baby does not recover, the baby is believed to be suffering from “*homa za babu*.” Prescriptions for the management of “*homa za babu*” are commonly referred to as “*dawa za babu*” these include: a) exposing the baby to smoke obtained from burning Swahili medicine; b) applying garlic or soot on the baby’s face, palms and under his feet or; c) shaving one part of the baby’s hair and applying medication on this part of the head. The section below presents the beliefs associated with these practices.

4-a) Exposing the baby to smoke obtained from burning Swahili medicine when he has convulsions

When newborns have *homa za kukutwa* (convulsions), people sometimes burn dry *Swahili medicine* (mostly dry leaves obtained from herbs) and make the newborn inhale the smoke to treat the “disease.” While carrying out this treatment, it is common not to wash the newborn. Newborns are made to inhale the smoke in the morning and, as they sleep, a light smoke obtained from burning the medicine is directed to the sleeping newborn.

Mothers had varying beliefs about the practice of fumigating newborns who were ill. Some of the mothers believed that fumigation kept evil spirits away, some believed that this was done when the baby had *homas* (fevers) and others that it was “just a tradition.” Table 6.5 summarizes mothers’ beliefs and motivations.

Table 6.5: Mothers’ beliefs and motivations for exposing newborns who are ill to smoke

Beliefs and motivations	Number of women who expressed this belief*
“To keep away evil spirits [<i>mashetani, wadudu</i>]”	5 out of 13**
“This is done when the baby has homas [diseases characterized by fever]”	3 out of 13
“This is done when the baby has problems (problems not specified)”	2 out of 13
“This is just one of our traditions”	2 out of 13
“So that the baby does not smell good”	1 out of 13

*The beliefs are not mutually exclusive, a mother can express more than one specific belief

**N₁=13 peri-urban mothers

4-b) Applying soot on the baby’s face, palms and under his feet

Another local treatment sometimes prescribed for convulsions is to apply *masizi* (soot)—or to a lesser extent garlic—on the baby’s face, palms and under his feet. Older Pembans generally describe this practice as one that “scare[s] evil spirits away” (data not presented). Mothers’ motivations and beliefs associated with the practice of applying soot are summarized in table 6.6 below.

Table 6.6: Mothers’ beliefs and motivations for applying soot on the baby’s face, palms and under his feet

Beliefs and motivations	Number of women who expressed this belief*
This is just one of our traditions	2 out of 13**
So that people cannot tell who the baby resembles/what the baby looks like/that the baby has a light color	3 out of 13
To keep away <i>wadudu wabaya</i> (evil spirits)	2 out of 13
Because the mother is unclean	1 out of 13
I don’t know	3 out of 13

*Beliefs are not mutually exclusive, a mother can express more than one belief

**N₁=13 peri-urban mothers

4-c) Shaving parts of his hair and applying traditional medicine

Another prescription for illnesses that are believed to be of “Swahili origin” is to shave one part of the baby’s hair and to apply medication on this part of the head. As soon as the hair grows on this part, one should shave the part that was not shaved and apply medication. This practice is known as “*kupasua umba*.”

In contrast to TBAs and traditional healers, whom we found to be very knowledgeable about these and other healing practices (data not presented), mothers in our sample did not seem to know why these practices were carried out. For example, from table 6.7 below, it can be seen that 6 of the 12 respondents could not supply a motivation for the practice.

Table 6.7: Mothers’ beliefs and motivations about shaving part of the baby’s hair and applying medication on it

Beliefs and motivations	Number of respondents expressing belief*
“I don’t know” (or no response)	6 out of 13**
“When you try different medicines and these don’t work, you shave part of the baby’s hair and apply medicine on it”	4 out of 13
“This is just one of our beliefs” (or traditions)	2 out of 13

*The beliefs are not mutually exclusive, a mother can express more than one specific belief **N₁=13 peri-urban mothers

Theme 3: Ritual pollution and postpartum seclusion

In addition to sexual abstinence during postpartum seclusion, in Pemba, a new mother cannot cook or sleep in the same bed with her husband because she is considered unclean, and may be a source of ritual pollution. As one peri-urban mother in our study explained it:

“According to our beliefs, us, the Waswahili, the Muslims, when one has those things that come out, after giving birth, one does not walk around, unless you need to take the baby to the hospital or you are told that you need to go to the hospital yourself. You are not even allowed

to pray, until those things stop coming out of you, then you purify yourself and then you can begin praying.”

Beliefs related to postpartum seclusion often require new mothers to be secluded, preferably in their natal homes. However, in this research, we observed some variability in the extent to which mothers chose to be secluded away from their own homes. For example, in the peri-urban sample all but one of the women returned to their natal homes for the seclusion period. In contrast, in the rural sample, only 23% (n=6) chose to be secluded in their natal home (see table 6.1). All of these 6 rural women had less than 2 children, whereas all the rural mothers who had more than two children remained secluded in their own homes, and their mothers came to live with them during this time to help with child care. Because of concerns about ritual pollution, even during seclusion in their own homes, mothers did not sleep in the same room or bed as their husbands.

To mark the end of these forty days of postpartum seclusion (the actual length of time may vary), a cleansing ritual called “*kujitia tohara*” is performed and, sometimes, a feast may accompany the ritual. During the cleansing ritual, the woman takes a bath in water mixed with herbal medicine. After the ritual, the mother and the baby are now allowed to go outside of the courtyard and, if she was secluded in a different house, she is allowed to go back to her own home. The mother may resume her normal duties again, including returning to the fields to work, fetching water and cooking. Now, she spends less time with the baby and family, friends or neighbors may become the primary caretakers. She is also allowed to sleep in the same bed as her husband, and to resume routine religious activities.

Theme 4: Infant feeding beliefs and practices

a) Breastfeeding initiation

Soon after delivery and before breastfeeding is initiated, a male family elder

usually recites *adhana* (the Muhammadan call to prayer) in the newborn's right ear. 11 out of 13 of the peri-urban mothers described *adhana* as a religious requirement. The other two believed that the call to prayer was "just a tradition."

In the section that follows, I present mothers' beliefs about feeding the newborn once breastfeeding is initiated.

b) Beliefs about breastmilk and infant feeding

In contrast to cultures where breastmilk and even other liquids are not regarded as food, many respondents believed that breastmilk is the ideal food for the baby. As one 26 year-old peri-urban mother noted:

"[A baby is breastfed] so that he gets strength, and this is his food, he is breastfed so that he becomes healthy, he gets full [the respondent laughs]."

In the study, mothers, almost without exception, discussed breastmilk as being beneficial to the baby's health and nutrition. Local beliefs correspond well with biomedical discourses, which stress that "breastmilk is natural." Mothers viewed breastfeeding as "normal" behavior, and as a way to transmit good health and nutrition to their babies. Beliefs about breastmilk and breastfeeding are reported in table 6.8.

Table 6.8: Mothers beliefs about breastmilk and breastfeeding

Mothers' beliefs about breastmilk and breastfeeding	Number of peri-urban respondents (out of N ₁ =13) who expressed belief*
"Breastmilk is baby's food"	4 out of 13**
"Babies who are breastfed are healthy"	4 out of 13
"Breastmilk is better than anything else"	3 out of 13
"Breastmilk has a lot of vitamins/water"	3 out of 13
"Breastmilk contains everything"	
"Babies are breastfed so that they get strength" or "breastmilk builds the body"	2 out of 13
"Babies are breastfed so that they develop quickly"	0 out of 13
"It is the norm to breastfeed babies"	0 out of 13
"I don't know"	1 out of 13

*With the exception of "I don't know," the beliefs are not mutually exclusive, a mother can express more than one specific belief

Because respondents believed that a new pregnancy could contaminate breastmilk and harm the lactating baby, mothers were expected to cease breastfeeding as soon as they find out that they are pregnant again. To a lesser extent, because of concerns for the breastfed newborn's health, sexual abstinence was prescribed as a means of preserving breastmilk from being contaminated by semen.

c) Beliefs about breastmilk substitutes

In addition to breastmilk, respondents prescribed biscuits, thin gruels, powder milk and cow's milk as appropriate supplements if a newborn is not satisfied with his mother's milk. Respondents noted that there are various signs that indicate that a newborn is not satisfied with his mother's milk. These signs included crying, "seeming disturbed" or "licking his fingers." There was some ambivalence among the mothers about giving newborns breastmilk substitutes. One 32-year old peri-urban mother expressed the ambivalence about giving newborns water to drink as follows:

"The newborn is given water to drink because he is thirsty. But you shouldn't give the baby water when he is still very young, you should only give the baby water when he needs it. When the baby breastfeeds, he is satisfied, he has already got enough water, so there is no need to give him water."

Mothers' beliefs about giving newborns fluids to drink are summarized in table 6.9.

Table 6.9: Beliefs about giving newborns water to drink

Water (including water with glucose)	“It is given when the baby is thirsty”	8 out of 13	0 out of 30
	“Water is important for the body” or “it builds the baby’s body” or “it helps” or “Water is good for the baby” or “Water is healthy”	2 out of 13	9 out of 30
	I don’t know	0 out of 13	7 out of 30
Gripe water	“When the baby has stomach problems” or “this is medication”	Question not asked	5 out of 30
	“It helps” (for example, in digesting food)		2 out of 30
	“So that the baby becomes healthy”		1 out of 30
	I don’t know		9 out of 30

One 40 year-old peri-urban mother expressed ambivalence about giving newborns powder milk as follows:

“Powdered milk is given according to the parents’ wishes, some parents give their babies powder milk, others do not, but it is not a must, it is according to one’s wish, some people do not like powder milk, but others find that their own milk is not enough for the baby.”

A 27-year old rural mother explained her doubt about cow’s milk as follows:

“Babies are given cow’s milk so that they get food, but the doctors tell us not to give the baby cow’s milk because it has got a lot of fat in it.”

Mothers’ beliefs about newborns fluids are summarized in table 6.10.

Table 6.10: Beliefs about giving newborns fluids to drink

Breastmilk substitute	Beliefs associated with substitute	Number of peri-urban mothers (out of N ₁ =13) who expressed belief*	Number of rural respondents (out of N ₂ =30) who expressed belief*
Thin porridge	“This is given to the baby because he is not yet able to digest heavy foods”	7 out of 13	1 out of 30
	“To prevent hunger” or “when the baby is not satisfied”	2 out of 13	1 out of 30
	“This is food for the baby”	1 out of 13	1 out of 30
	“The baby is given thin porridge so that he begins to get used to other foods”	1 out of 13	
	“Porridge builds the baby’s body” or “porridge provides strength” or “porridge makes the baby healthy” or “porridge helps”	0 out of 13	8 out of 30
	“Some babies like to drink porridge”	0 out of 13	1 out of 30
	I don’t know	0 out of 13	5 out of 30
Powder milk	“This makes the baby healthy”	4 out of 13	4 out of 30
	“This is given when the mother’s milk is not enough”	4 out of 13	0 out of 30
	“It is good/it helps the baby’s body develop/it builds the body”	2 out of 13	3 out of 30
	“This is given when the mother works”	1 out of 13	0 out of 30
	“This is given so that the baby can get used to the bottle/ so that you can breastfeed the baby less”	2 out of 13	0 out of 30
	“This is given when there is no cow’s milk”	1 out of 13	0 out of 30
	“This is food for the baby”	0 out of 13	5 out of 30
	I don’t know	0 out of 13	5 out of 30

* With the exception of “I don’t know” a mother can have more than one belief

Table 6.10: Beliefs about giving newborns fluids to drink (continued)

Cow's milk	"It gives the baby strength" or "it builds the body" or "it is healthy"	3 out of 13	9 out of 30
	"It is given when the mother's milk is not enough"	3 out of 13	0 out of 30
	"It helps a lot/it is good for the baby"	2 out of 13	2 out of 30
	"It is given when the baby is hungry or thirsty" or "when the baby is crying" or "when the baby wants this" or "babies find it tasty"	2 out of 13	2 out of 30
	"It is food for the baby"	0 out of 13	1 out of 30
	"People like cow's milk a lot"	0 out of 13	1 out of 30
	I don't know	0 out of 13	3 out of 30

* With the exception of "I don't know" a mother can have more than one belief

Surprisingly, mothers reported giving biscuits to newborns. After probing more about this practice, we found that mothers softened the biscuits with tea, water or milk to make it easier for the newborn to eat. Mothers' beliefs about giving newborns solids and folk fluids to drink are summarized in table 6.11.

Table 6.11: Beliefs about giving newborns solids and folk fluids

Solids or folk fluid	Beliefs associated with solids or folk fluid	Number of peri-urban respondents (out of N ₁ =13) who expressed belief	Number of rural respondents (out of N ₂ =30) who expressed belief
Biscuits	“These are given to the baby when he is hungry”	8 out of 13	2 out of 30
	“These should not be given to a newborn”	3 out of 13	0 out of 30
	“These should be given when the mother has no milk”	2 out of 13	0 out of 30
	“This is food for the baby”	2 out of 13	0 out of 30
	“So that babies can get strength in their bodies” or “it builds their bodies” or “babies become healthy”	0 out of 13	6 out of 30
	“So that babies get proteins” or “biscuits are nutritious”	0 out of 13	2 out of 30
	“When babies cry a lot”	0 out of 13	1 out of 30
	I don’t know	0 out of 13	5 out of 30
Traditional (oral) medicine such as <i>tonga</i> , <i>vichukio</i> , <i>kachiri</i> and <i>shubili</i>	“When the baby is ill” or “as a cure for stomach aches and pains” or “when it is difficult to go to the hospital for treatment”	Question not asked	12 out of 30
	I don’t know		5 out of 30
Dates	“They build the body” or “they are healthy” or “they help” or “they provide blood”	Question not asked	8 out of 30
	“So that the baby can know the sweet taste (of dates)”		1 out of 30
	I don’t know		8 out of 30
	I don’t know		7 out of 30

* With the exception of “I don’t know” the beliefs are not mutually exclusive, a mother can generate more than one belief

Table 6.11: Beliefs about giving newborns solids and folk fluids (continued)

Honey	“It builds the baby’s body” or “it is healthy”	Question not asked	4 out of 30
	“So that babies begin to talk early”		1 out of 30
	“It is used as medication”		1 out of 30
	“So that the baby can know the sweet taste (of honey)” or “Islamic law advises us to give babies honey immediately after they are born, if we have any”		2 out of 30
	“I am afraid of giving this to my babies”		1 out of 30

d) Using a spoon or a bottle to feed breastmilk substitutes to the newborn

Should an infant be fed with breastmilk substitutes, the advantages of using a spoon or a cup to feed the substitutes (in comparison to the use of bottles and rubber teats) has been noted (see chapter 2). We asked the peri-urban mothers what their perspectives were about the use of the spoon or the bottle. Most of the mothers believed that a spoon is preferable when the baby is “young.” In contrast, mothers prescribed the use of a bottle when the baby is “hungry” or that the bottle is preferable to a spoon. None of the mothers mentioned the issue of cleanliness. The beliefs and perceptions related to feeding newborns using a spoon or a bottle are summarized in table 6.12 that follows below.

Table 6.12: Respondents' beliefs about spoon and bottle feeding newborns

Beliefs		Number of peri-urban mothers who expressed this view (out of N ₁ =13)*
Beliefs about feeding newborns using a spoon	"This is done when the baby is too small/young" or "he is not yet able to use cups, glasses or bottles"	7 out of 13
	"Spoon feeding is easier than using a bottle"	1 out of 13
	"This is done when the baby is unable to breastfeed"	1 out of 13
	No response/ I don't know	1 out of 13
Beliefs about feeding newborns using a bottle	"When the baby is hungry" or "when the baby is not able to feed himself" or "when the mother does not have enough milk"	5 out of 13
	"Using a bottle is better than using a spoon"	4 out of 13
	"Newborns should not be fed using a bottle"	3 out of 13
	"So that the baby gets used to the bottle"	2 out of 13
	"This is for mothers who work"	2 out of 13
	"So that the baby can drink liquids that he likes"	1 out of 13
	"This is done when the baby cannot breastfeed"	1 out of 13

* With the exception of "I don't know" the beliefs are not mutually exclusive, a mother can generate more than one belief

Discussion

The purpose of this study was to examine the newborn care-giving practices and the motivations for these. Recognition of women's traditional knowledge, which is based on humoral and health belief rationales, must be considered before developing health education strategies designed to improve care-giving behaviors.

a) Results from both samples in relation to beliefs about breastmilk substitutes

There may be subtle differences in beliefs about breastmilk samples for the rural women in comparison to the peri-urban women. Rural women's beliefs about breastmilk substitutes seem "anchored" in perceptions about the quality of the substitute itself. In contrast, the peri-urban women's beliefs appear tied to concern about the newborn's health. An illustrative example is related to the use of porridge as a breastmilk substitute: while the peri-urban women expressed concern about the

newborn's health by noting that porridge is given to the newborn because he is not yet able to "digest heavier foods," rural women believed in the attributes of porridge, and noted that it "builds the body." Because the rural responders were, on average less well educated than their peri-urban counterparts, these subtle differences may be explained, in part, by differences in levels of education. However, as shown in the chapter that follows—in which the peri-urban and rural women's conceptual maps in relation to feeding the newborn were found to be strikingly similar—the differences in beliefs are indeed subtle, and are not deeply ingrained. As discussed in the chapter that follows, the finding that the differences are only subtle is encouraging in terms of planning programs and extending the results more widely.

b) Interpreting beliefs and practices related to newborn care in relation to current biomedical knowledge

In Pemba, understandings of health and illness appear heavily influenced by a belief in "supernatural" interventions, which are mediated through traditional practices and medicines. The results of this study suggest that beliefs that underlie neonatal care-giving practices are related to: a) fear of death during delivery; b) vulnerability of the newborn; c) ritual pollution after childbirth and d) feeding strategies that presumably enhance newborn health and survival. Adherence to practices that support a Swahili world view is central to Swahili notions of newborn health and well-being. Non-compliance to these practices is believed to result in ill health for the newborn. Thus, transgressions of culturally valued practices are perceived to have adverse health implications. These understandings may contrast with the Western medicine paradigm in which notions of health and disease are understood in terms of biochemical and physiological balances and imbalances.

As described in detail in Chapter 3, the World Health Organization guidelines for essential newborn care includes: a) cleanliness b) thermal protection c) initiation of

breathing, early and exclusive breastfeeding d) eye care e) preventing newborn illness by immunization and management of illness when these occur (WHO, 1996). For a mother and her family, this means preparing for birth, choosing a safe place for delivery, keeping the delivery process clean, avoiding the cold, breastfeeding early and exclusively, and understanding and reacting to potential danger signs (Osrin et al., 2005).

In the sections below, I discuss how local strategies to promote newborn health and survival may conflict with biomedical recommendations for essential newborn care. I then suggest ways in which we may build on local cultural understanding to promote positive newborn care-giving behaviors.

a) Assistance with childbirth and hygiene considerations during delivery

In both samples, only about a half of the women delivered with the help of skilled attendants (see table 6.2). Various factors may have discouraged mothers from delivering at the hospital, including problems with travel, fear of being humiliated by health care personnel, and lack of sufficient funds to pay for services at the hospital. Similar problems have been reported in other settings in the developing nations. For example, as Shakya and McMurray (2001), make the case, in Nepal, although it costs about USD 6.50 per night at the public hospital, women are charged for medicines and for the use of certain facilities, which results in a decision for home delivery for the vast majority of poor women.

In the long term, efforts to encourage women to deliver with the help of skilled attendants should be a high priority. This will require a change in investment policy for reproductive health services, training health care workers to have better encounters with mothers and reducing the cost of delivery at the hospital setting.

Umbilical sepsis and associated neonatal septicemia, as well as neonatal tetanus can be prevented by keeping the cord clean and not applying substances such as ash to the stump. This is one of the essential elements of newborn care practices. Mothers were generally aware of the importance of using sterilized equipment during delivery, and that the use of unsterilized equipment was a major risk factor for child illness. However, because we did not observe any home births, and we relied on verbal accounts, we do not know the extent to which traditional birth attendants use good hygienic practices during delivery. Clearly, further research is needed in this area.

b) Thermal protection of the newborn

Neonatal hypothermia is an important contributing factor to neonatal mortality (Mann, 1955; Mann and Elliott, 1957) and is therefore a focus for essential newborn care (WHO, 1996). For instance, bathing the neonate immediately or within a half hour of delivery has negative effects on thermal control, especially among low birth weight babies (Raman et al., 1996). Clean and dry wrapping of the neonate is one of the ways of avoiding hypothermia (WHO, 1996). In this setting, mothers were generally concerned about keeping newborns warm and protecting them from the cold. Customarily, newborns are wrapped with a clean (preferably new) traditional cloth immediately after delivery. This practice is likely to be beneficial, and it should continue to be encouraged in interventions designed to improve the care of newborn babies.

In Pemba babies are usually bathed, rather than simply wiped off, on the same day they are born. It is only when the baby is born at the hospital (where bathing immediately is discouraged, and where mothers are unable to find water and a source of heat) that washing is delayed. Perhaps, as suggested by Fikree et al. (2005), among Muslims, bathing the baby immediately after delivery may have religious connotations. The interplay between the vernix, which is culturally viewed “dirty,”

and bathing as “ritually cleansing,” could be a potential hurdle in advocating delaying bathing as a behavior change strategy for preventing neonatal hypothermia.

c) Preventing and managing illness in the newborn

In most areas where traditional care predominated in the first half of the 20th century, there is now widespread acceptance of many aspects of Western medicine, often without any sharp reduction in traditional beliefs and healing practices (Pelto and Pelto, 1997). This setting is no exception. Regardless of cultural beliefs, people in this setting were willing to use elements of Western medical practice without giving up major aspects of their traditional explanations of illness, utilizing both traditional and western health care resources, sometimes serially, sometimes simultaneously.

Many participants in this study had adopted Western biomedical understandings of vaccination. However, at the time of the interview, (ranging between 2 and 32 days postpartum), none of the families had immunized their babies. Because, by this time, infants should have received the BCG (Bacille Calmette Guérin) immunization to minimize the potential for serious forms of tuberculosis, this is an issue of concern. Additionally, resorting to traditional treatments, such as exposing ill newborns to smoke or giving orally introduced medications, is of concern. Clearly, while respecting and recognizing the deeply rooted Swahili notions of illness and health, efforts to promote behaviors that promote optimal health and well-being for newborns are critical.

d) Infant feeding

a. Breastfeeding initiation

A previous study investigating infant feeding conducted in Pemba indicated that newborn babies may be given “sweet tasting prelacteals” so that they would have “sweet voices with which to recite the Koran” or “bitter tasting prelacteals” so that they would know that “life can be bitter” (Tschida, 2004). Although respondents in

our exploratory interviews (who included traditional birth attendants and traditional healers) had indicated that dates, honey, kachiri and shubili were prelacteals, mothers in both samples did not seem to interpret these as prelacteals. This suggests that the use of prelacteal feeds is less common than expected. From the point of view of early breastfeeding initiation, low use of prelacteals is an encouraging finding.

The practice of reciting *adhana* (the Muhammadan call to prayer) in the newborn's ear soon after delivery and before breastfeeding is initiated has been observed in other traditional muslim societies (see for example Fikree et al., 2005). This practice may not delay the initiation of breastfeeding by much, and we do not think it is of particular concern.

b. Breastfeeding exclusively

The finding that babies are supplemented with water and other fluids soon after they are born is an issue of concern. The belief that babies are thirsty, and that they need fluids such as water (plain or sweetened with glucose) was common in our interviews, as it is in many other parts of the world. A similar belief was reported in another Tschida's Pemba study (2004), suggesting that this belief may be widespread. This belief is in diametrical opposition to scientific observations that babies who are exclusively breastfed are sufficiently hydrated and that, even during hot periods in tropical settings, exclusively breastfed infants do not need liquid supplements to maintain water homeostasis, including proper excretion via the kidneys (Sachdev et al., 1991). It also runs counter to the observation that breastmilk alone provides adequate nutrition for the infant up to 6 months of age (see for example WHO, 1996).

In addition to water, other breastmilk substitutes commonly given to newborns included thin porridge; milk powder (modified or unmodified for newborn consumption); cow's milk; biscuits; dates and honey. Motivations for introducing these items into the newborn's diet included beliefs that the mother's milk is

insufficient; that the “baby is hungry” or to promote better health for the newborn.

Similar beliefs were also reported in Tschida’s (2004) Pemba study.

We note that however, that there was some variability in women’s beliefs across the two samples. For example, the peri-urban sample mostly invoked concern for the baby to justify giving newborns supplements with phrases such as “he is hungry,” or “he is thirsty. In contrast, the rural sample tended to invoke the positive qualities of the breastmilk substitutes, using phrases such as “porridge builds the body” or “water is important for the body.” This suggests that, for the peri-urban sample, messages to improve infant feeding behaviors should focus on the baby, while for the rural sample, they should focus on the qualities of breastmilk.

e) Other practices observed and their implications for newborn care

a. Influence of postpartum seclusion on infant feeding

As in some other parts of the world e.g. among the Zulu of South Africa (Ngubane, 1977) or among the Merkang in rural Malaysia (Laderman, 1987), the first 40 days after birth constitute a period during which the mother and the newborn are secluded from the larger community. Various anthropologists, including Ngubane (1969), Whiting (1964), Saucier (1972), Shoenemaekers et al. (1981) and Zulu (2001) have conceptualized post-partum abstinence as a form of discrimination against women. The authors argue that, in societies where older people are highly respected, where polygamy is prevalent, where marriage is formalized through relatively high bride prices, and where males dominate women, long periods of post-partum abstinence are likely to be observed.

The authors propose that, depending on the time under consideration, abstaining from sex during the early postpartum period is often justified by concerns for the newborns’ health and for the health of males in the mother’s environment—

particularly the baby's father. In the first few weeks following birth when the woman is still experiencing postpartum bleeding, abstaining from sex is justified by concerns for the man's health. This reflects popular belief that a woman's reproductive blood (from menstruation, postpartum or miscarriage bleeding) is dangerous to a man's health and can cause him harm. To protect men from harm, new mothers are encouraged not to have any sexual relations during the early postpartum period. Because Islam also prohibits sexual intercourse during the time when a woman is experiencing postpartum bleeding, in Muslim communities in sub-Saharan Africa, this traditional belief fits well with religious prescriptions.

I agree with the authors that postpartum seclusion may be a form of discrimination against women. I also agree with Fikree et al. (2005) that beliefs about ritual postpartum pollution may discourage mothers from visiting health care facilities during the newborn period and propose further research in this area. However, in my view, postpartum seclusion should not be viewed exclusively as a negative practice.

Firstly, postpartum seclusion may be beneficial for the mother because it is a period during which she is not allowed to work or to do anything that is physically exhausting. This allows her to rest and to regain much needed strength, and provides her the opportunity to establish a special bond with her newborn baby. Secondly, and with respect to breastfeeding, the practice of postpartum seclusion provides an ideal situation for initiating early and exclusive breastfeeding and for providing effective post-delivery social support. This fits with cultural norms and expectations, according to which, secluded from the larger society, the mother and newborn remain in close proximity, the mother has uninterrupted time with the newborn, and is not distracted by other household tasks. Thirdly, when the newborn is secluded, he has limited contact with the outside world, and may be less exposed to communicable diseases. Thus, for both the mother and the child, postpartum seclusion could be very beneficial.

b. Massage and the application of topical oils

Another routine newborn care practice that is reported in South Asia (Darmstadt and Saha 2002; Fernandez et al., 1987), and that was reported in this setting, is the application of oils to the skin of newborns. Recent evidence suggests that topical application of certain oils may improve skin barrier function in humans, resulting in a number of potential benefits to neonatal health, particularly in preterm infants whose skin barrier is immature and functionally compromised (Fernandez et al., 1984; Iyengar and Bhakoo, 1991; Johanson et al., 1992; Darmstadt and Dinulos, 2000). However, not all oils are beneficial. Some topical products, such as mustard oil or olive oil, may have detrimental effects on the epidermal structure and barrier function, which increases the risk of neonatal septicemia especially in low birth weight and premature babies (Darmstadt et al., 2002). For low birth weight and premature babies, another potentially important aspect of skin massage is the risk of injury to the skin in the course of handling their extremely fragile skin during massage (Edwards et al., 2001). In this setting, we found that coconut oil is commonly used. Further research is needed to elucidate the effects of coconut oil (whether beneficial or harmful) for newborn skin.

Conclusion

When programs are designed to meet local conditions, their potential for impact is higher, even in resource poor settings (Williams and Jones, 2004). The findings reported here are based on self-reported data from two small convenience samples. While the data may be subject to various forms of recall and response bias, because the mothers we interviewed knew that we respected their knowledge and valued their opinions, this may have encouraged them to be fully expressive. We therefore have little reason to believe that they were not telling the truth as they saw it. Because the samples are small and respondents were not randomly selected, we do not

have definitive evidence that our descriptions represent normative beliefs and practices. Even within these two samples, we noted the variability of some of the beliefs expressed in relation to feeding infants breastmilk substitutes: the peri-urban sample tended to invoke concern for the baby, while the rural sample tended to invoke the benefits of the breastmilk substitutes for the infant. These nuances could be attributed to differences in the level of education: almost all peri-urban women had a secondary school education, while only about one half of the rural sample had a primary school education, the other half had never been to school. Because there is a paucity of data on how newborns are routinely cared for in other sub-Saharan Africa settings, much less the motivations for these practices, we cannot compare the results obtained with results from studies in other parts of the region.

This study illustrates the richness and diversity of beliefs and motivations for newborn care-giving practices among the Swahili of Pemba. The cultural and social information elicited in this study may be useful for defining and elaborating educational messages to improve some of the sub-optimal practices identified. To be effective, health education messages must emanate from within the cultural context, where traditional knowledge concerning perceived health benefits are generated and transmitted. Efforts to facilitate the development of a comprehensive neonatal health policy and programmatic strategies need to contemplate on the synergies between anthropology and the biomedical theory of disease causation and prevention. This is the challenge for improving newborn care homes in Pemba and elsewhere in Africa.

CHAPTER 7

ROUTINE CARE OF THE NEWBORN IN PEMBAN HOUSEHOLDS: THE PILE SORT ANALYSIS

Objective

In preparation for a future intervention designed to improve sub-optimal feeding behaviors during the newborn period, the main objectives of the research presented here is to: a) assess respondents' perceived relationship between feeding and other newborn behaviors in the peri-urban and rural communities in Pemba. To achieve these objectives, data were collecting using the pile-sorting ethnographic technique of cognitive mapping and analyzed using Multi-Dimensional Scaling supplemented by hierarchical clustering.

Methods

1) Site and sample selection

The research utilized two small samples of mothers from the Pemba Island of Tanzania. The description of the site and the selection of the two samples (one peri-urban, the other rural) are both provided in chapter 6. Because the pile sorting exercise (described in the section that follows) required literacy, and because some of the rural women could not read, data was only collected from those rural women who were literate (n=9).

2) Data collection

Pile sorting is an ethnographic, cognitive mapping, technique that provides descriptive information about how respondents perceived similarities among a number of objects, items, or events (Weller and Romney, 1988). For the sorting task, respondents are provided with a set of stimuli. These can be short descriptions of the objects, items or events written on index cards, or when possible, the physical objects and items themselves. Respondents are instructed to put the items into piles that

“belong together.” After the sorting respondents are asked to explain why particular items were grouped together and to discuss the beliefs they associate with each group.

An analysis of pile sort data from each respondent produces a picture of the individual’s “cognitive map” of the relationships between the different objects, items or events provided to him or her. However, pile sort data from multiple respondents are often aggregated to provide a description of the shared “cognitive map” or the cultural understanding that is shared within the group.

To determine women’s perceptions about relationships among common care-giving practices for newborns in Pemba, we first wrote short descriptions on index card of the care-giving practices we had elicited from key informants from Chasasa (traditional healers, traditional birth attendants) and from nurses from Wete hospitals. In total, 34 short descriptions were written on index cards. All 13 mothers from Chasasa (the peri-urban sample) were asked to sort these index cards into four piles. It is common practice among ethnographers to restrict the number of piles respondents are asked to make, *a priori*, in order to ensure that responses across informants are comparable. As explained by Borgatti (1996), this is because some informants will tend, as a matter of personal style, to be “lumpers” while others will be “splitters.” In other words, regardless of the cultural domain under investigation, some respondents tend to take a broad view and to make very few piles, while others tend to split hairs and make as many piles as they can. Two such respondents could have identical views regarding what is similar to what, but they choose to answer at a different level of detail using different numbers of piles. Consequently, their data can look different, and measures of similarity or distance will find the respondents different. Therefore, when the group’s shared cultural understanding is to be studied, all respondents should be required to make the same number of piles.

Women were given the following instructions: “*Each of these 34 cards contain*

the description of a common care-giving practice for newborns in Pemba. Please group the cards into four categories that make them alike. You can have as many cards in a pile/category as you want, and you don't have to put more than one card in a category.” After sorting, the women were asked to explain why they had grouped specific practices together and to discuss the beliefs they associated with each group.

In order to find out whether rural women had similar views to the women in the peri-urban area, the literate women in the rural sample, who were interviewed for the larger study, (9 in total) were also asked to participate in a similar exercise in which the same stimuli were used and the same directions for pile sorting provided. The directions for the pile sorting exercise are translated in English and provided in appendix 7.1a, the Kiswahili version can be found in appendix 7.1b.

3) Data analysis

Multidimensional scaling (MDS) was used to provide a visual representation of the pattern of similarities or differences among the pile-sorted items. The pile sort data were entered into the ANTHROPAC software program (Borgatti, 1996). The program derived a proximity matrix, which was then entered into the SPSS software program and analyzed using multidimensional scaling. To do this, the program found a set of points in two-dimensional space such that the distances among these points corresponded as closely as possible to the input proximities. The algorithm estimated the value of stress (range from 0 to 1), which refers to the amount of distortion between the actual numerical values in a proximity matrix and the representation of those values in the MDS plot (Clark et al., 1998). Ideally, zero stress would show a perfect fit of the data. In practice, it is generally agreed that stress below 0.1 indicates a good fit between the actual proximities and their representation (Kruskall, 1964).

In the visual representation, items judged to be similar appeared to be “clustered” together. While identifying members of a cluster was relatively

straightforward when these were well separated, additional analysis was required for identifying membership where clusters were less visually distinguishable. For this reason, we used the “hierarchical clustering” technique to confirm and the results of the MDS. As with MDS, hierarchical cluster analysis is a multi-variate statistical technique. As with MDS, the approach requires a measure of similarity which can be used to generate a proximity matrix.

According to Anderberg (1973), “agglomerative hierarchical algorithms” which are commonly used for hierarchical clustering, begin by considering that each item constitutes an individual cluster. The next step is to “group” items that are most similar (based on the distances in the proximity matrix) together. At the next iteration, the sub-groups that are most similar are merged together. At the last iteration, all the sub-groups are combined to form one large, single cluster. The sub-groups merged in the last iteration tend to be least similar.

As with MDS, increasing the number of clusters increases the “fit” of the model. Evidently, it is preferable to have the fewest clusters possible so as to be able to summarize the data succinctly. However, sometimes the clusters do not separate well, making it difficult to decide on the number of clusters which best fit the data. In contrast to MDS, 1 indicates a perfect fit, while numbers closer to “0” indicate poorer fit. The ANTHROPAC software program (Borgatti, 1996) allows an analyst to specify the number of clusters desired and to find out the fit of the data in relation to the number of clusters. When there is no significant improvement in the fit of the model achieved by increasing the number of clusters, one can reasonably conclude that the number of clusters is adequate. Once an analyst has defined the number of clusters that best fit the data, the next step was to find out which items belong to each of the clusters. To do this, an analyst can utilize the “the clustering via tabu search” option available in the ANTHROPAC software program, in which one specifies the

number of clusters preferred, the corresponding output is membership in each cluster.

Results

Sample demographic characteristics

The socio-demographic characteristics of both peri-urban and rural samples are provided in Table 7.1 below. In the following section, the results of the peri-urban are presented first, followed by the results from the rural sample. As the assessment of stress influences decisions about the number of dimensions that are selected to represent the cognitive map, I begin by presenting the data on stress.

Table 7.1: Sample demographic characteristics

Characteristics	Peri-urban sample of mothers (N ₁ =13)	Rural sample of literate mothers (N ₂ =9)
Mean age of mothers in years (range)	30 (23-41)	28 (18-40)
Mean number of children (range)	4 (1-8)	4 (1-8)
% women who had 1 or more children die	Not asked	31%
Delivery with the help of skilled attendants at the hospital	62%	46%
Monogamous relationship with spouse	85%	64%
Level of education	% no schooling	8%*
	% primary school	0%
	% secondary school	92%
Postpartum seclusion	Her natal home	99%
	Her own home	1%
		64%

* This respondent had never been to school but she could read

Results of MDS scaling of newborn care practice pile sorting: peri-urban women

The first two columns in Table 7.2 indicate the levels of *stress* in relation to the number of dimensions in which the pile sort data could be represented. The right hand column evaluates these in relation to Kruskall's (1964) informal guidelines for evaluating the "goodness of fit" of the representation in relation to the original data.

Table 7.2: Stresses obtained from the Multi-Dimensional Scalings for the peri-urban sample

Dimensions	Stress obtained	Comparison to Kruskall's (1964) informal guidelines
1	0.425	Poor
2	0.243	Poor
3	0.143	Fair
4	0.098	Good
5	0.068	Good

The above table shows that increasing the number of dimensions reduces the level of stress. However, increasing the number of dimensions above 2 makes it difficult to display on paper, and even more difficult to comprehend. Four or more dimensions render MDS virtually useless as a method of making complex data more accessible to the human mind (Borgatti, 1996). In other words, most people are unable to conceptualize space in more than three dimensions. For this reason, while recognizing that adding more dimensions would provide a more accurate geometric representation, in this study, we chose to stop at 2 dimensions where we obtained a stress of 0.243. Compared to Kruskall's (1964) informal guidelines for interpreting the level of distortion of the representation in comparison to the original data, the level we obtained can be termed as “poor.”

In the MDS plot presented in Figure 7.1 below we have omitted the labels for each specific item in order to simplify the figure.

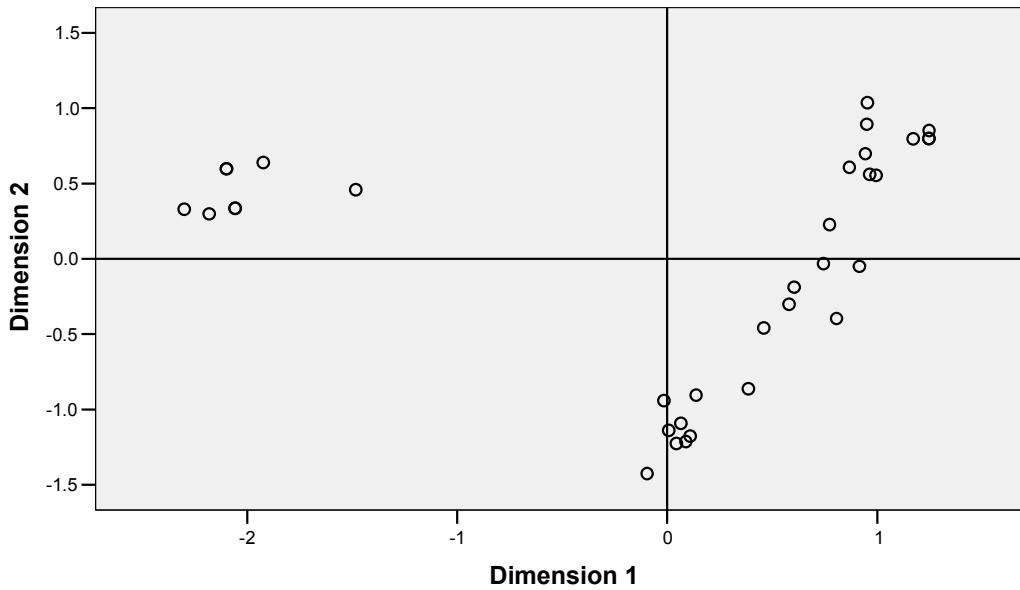


Figure 7.1. MDS plot of judged similarities among common newborn care-giving behaviors for the peri-urban women (stress in 2 dimensions=0.243).

In the above figure (7.1), one sub-group appears to be very different (distant) from members of other clusters, single. This group is located at the upper left extremity of the first dimension. Other behaviors form an arc spanning the right hand side of the second dimension and they appear less distinct. To distinguish membership in each of these clusters which are not so clearly separated, we turned to a hierarchical cluster analysis. Firstly, using ANTHROPAC, we determined the fit of the data in relation to the number of clusters. Table 7.3 below indicates the number of clusters in relation to the fit. From the table, it can be seen that, beyond five clusters, there is little improvement in the fit of the data.

Table 7.3: Number of clusters vs fit, larger numbers for fit indicate better fit

Number of clusters	Fit	
2	0.400	Difference in fit achieved by adding one more cluster greater than 0.02 for each additional cluster
3	0.567	
4	0.646	
5	0.695	
6	0.716	
7	0.740	Difference less than 0.02
8	0.766	
9	0.781	
10	0.781	

The next step in the analysis was to find out which items belonged in each of the five clusters. To do this, we turned to “the clustering via tabu search” option in ANTHROPAC, in which one specifies the number of clusters one wishes to have. For the five clusters, the output from this option was as shown in Table 7.3 that follows. The table indicates specific behaviors that are contained in each of the clusters. Cluster labels were determined by the analyst, and were chosen to provide a concise description of the items contained in each of the clusters.

Table 7.4 Specific behaviors contained in each of the clusters, membership in a given cluster was determined using hierarchical clustering

Cluster Label	Specific items grouped within the cluster	
Feeding behaviors	<ul style="list-style-type: none"> - Baby given liquids using a spoon - Baby given liquids using a bottle - Baby given biscuits - Baby given powder milk 	<ul style="list-style-type: none"> - Baby given water - Baby given cow's milk - Baby given porridge - Baby breastfed
Preventive behaviors	<ul style="list-style-type: none"> - Baby wrapped - Baby wrapped with a khanga - Baby washed with water - Baby washed with soap - Oil applied on baby's skin, - Olive oil applied on baby's skin - Oil applied on fontanelle - Baby massaged with warm hands 	<ul style="list-style-type: none"> - Baby massaged with coconut oil - Oil used to massage baby does not have a strong smell - Soap used to wash baby does not have a strong smell - Baby washed with Swahili medicine
Curative behaviors	<ul style="list-style-type: none"> - Part of baby's hair shaved and medicine applied on shaved part - Baby not washed 	<ul style="list-style-type: none"> - Baby made to inhale smoke from burned Swahili medicine
“Traditionally” motivated behaviors	<ul style="list-style-type: none"> - Baby called to prayer - Soot applied on baby's feet, palms and face - Kohl applied on baby's forehead or eyes 	<ul style="list-style-type: none"> - Oil mixed with Swahili Medicine applied on baby's skin, - Baby passed the doorway 7 days after birth
Birth-related behaviors	<ul style="list-style-type: none"> - Giving birth at home - Giving birth in the hospital - Baby vaccinated 	<ul style="list-style-type: none"> - Razor used to cut the cord boiled - Cord tied using a string or thread - Placenta buried

Thus, the results of the hierarchical clustering now allowed us to label the visual MDS figure. Figure 7.2 that follows provides the labels for the groupings identified in 7.1.

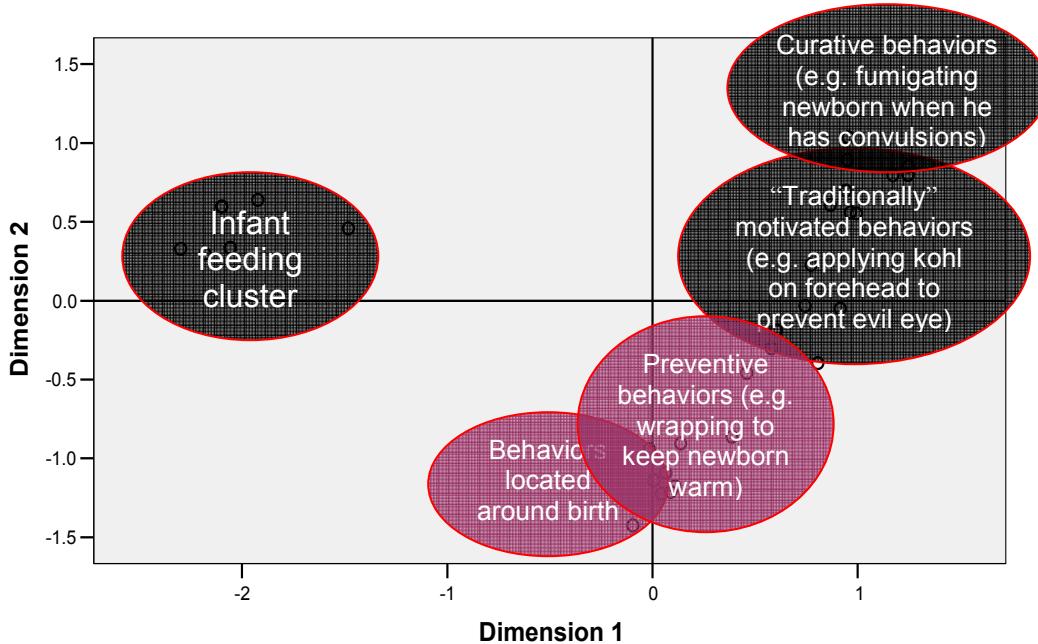


Figure 7.2. Information from the hierarchical cluster analysis allowed labeling of the clusters identified through MDS scaling (see in figure 7.1)

Results of MDS scaling of newborn care practice pile sorting: Rural women

The first two columns in Table 7.4 below indicate the levels of *stress* in relation to the number of dimensions in which the pile sort data from the rural women could be represented. The right hand column evaluates these in relation to Kruskall's (1964) informal guidelines for evaluating the “goodness of fit” of the resulting representation in comparison to the original data.

Table 7.5: Stresses obtained from the multi-dimensional scalings for the rural sample

Dimensions	Stress obtained	Comparison to Kruskall's (1964) informal guidelines
1	0.451	Poor
2	0.240	Poor
3	0.146	Fair
4	0.103	Good
5	0.082	Good

As with the MDS results from the peri-urban sample, we chose to stop at 2 dimensions where we obtained a stress of 0.240. In comparison to the original data,

and following Kruskall's (1964) informal guidelines, the level of distortion of the representation we obtained can be termed as "poor."

Figure 7.3 represents the simplified 2-dimensional plot produced by subjecting the sorting of the 9 literate women in the rural sample to MDS scaling. The figure is characterized by one grouping situated on the lower left extremity of the first dimension. The stress in two dimensions is very similar to the stress obtained in the in the peri-urban group: 0.240, compared to 0.243 for the peri-urban women. The labels for each specific item in the MDS plot presented in Figure 7.3 were omitted in order to simplify the figure, and are outlined in Figure 7.4 below. The specific behaviors contained in each of the clusters were comparable to those outlined in table 7.3.

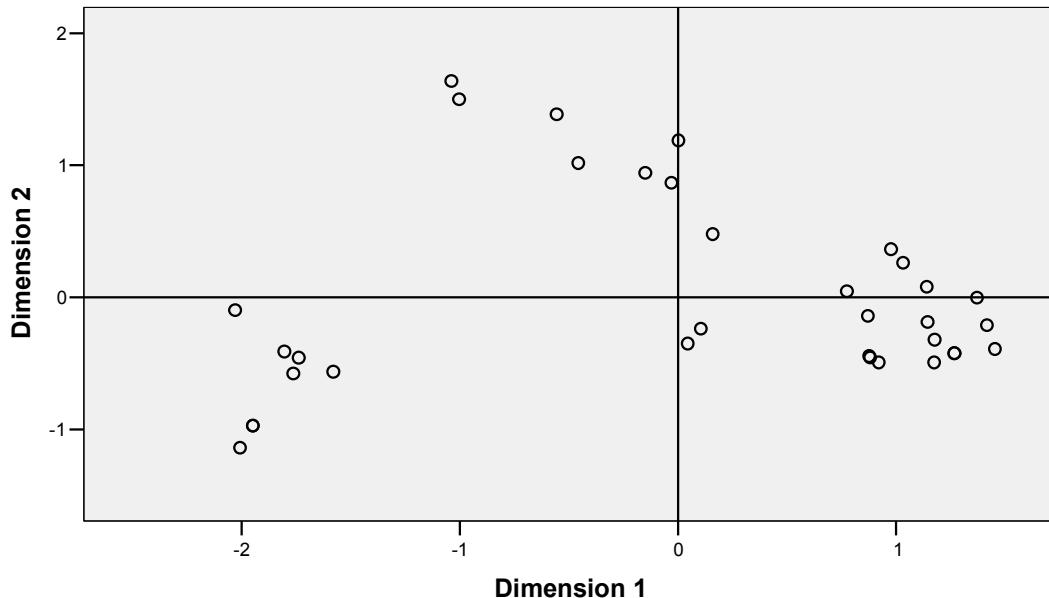


Figure 7.3. MDS plot of judged similarities among common newborn care-giving behaviors for the rural women (stress in 2 dimensions=0.240). Note that one grouping of behaviors is located at the lower left extremity of the first dimension.

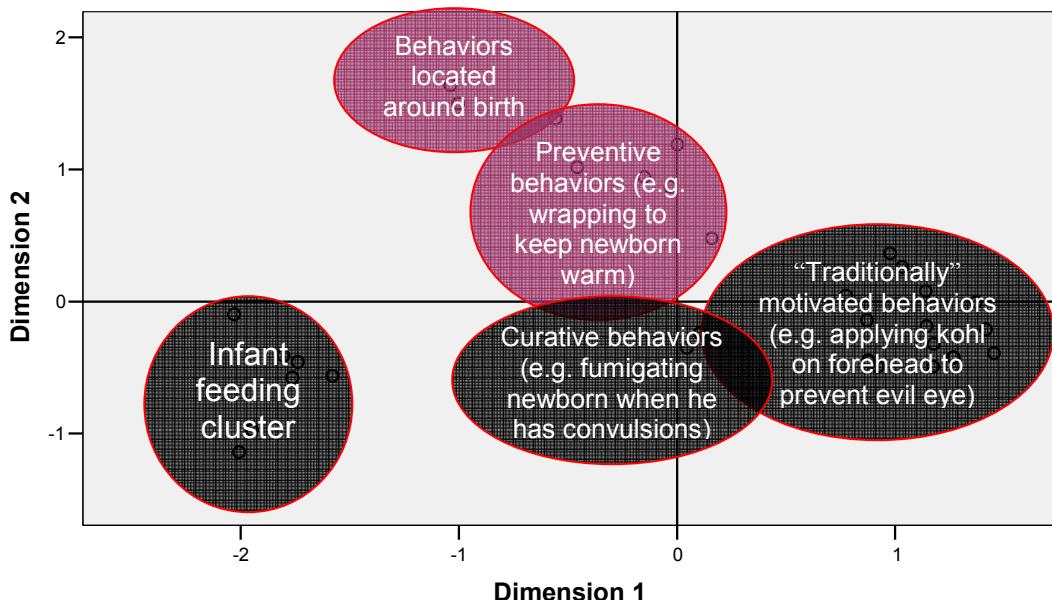


Figure 7.4. Clusters identified through MDS scaling of the rural women's sorting of the 34 newborn care behaviors.

Results obtained from merging the two samples

We then put both rural and peri-urban samples together in order to assess the impact of increasing the sample size on the level of stress. As shown in table 7.5 below, increasing the sample size did not improve the level of distortion

Table 7.6: Stresses obtained from the multi-dimensional scalings of the pooled sample

Dimensions	Stress obtained	Comparison to Kruskall's (1964) informal guidelines
1	0.418	Poor
2	0.247	Poor
3	0.142	Fair
4	0.094	Good
5	0.073	Good

In addition, as shown in Figure 7.5 below, the MDS scale obtained from pooling the two samples together is strikingly similar to that obtained with the peri-urban women. The feeding cluster is located on the bottom left hand side of the diagram and is separated from the other groupings along the 2nd dimension. As the cluster

membership was exactly as identified in figure 7.3 above, the labels for the figure are similar to those in table 7.3. The “stability” of the feeding cluster is most striking.

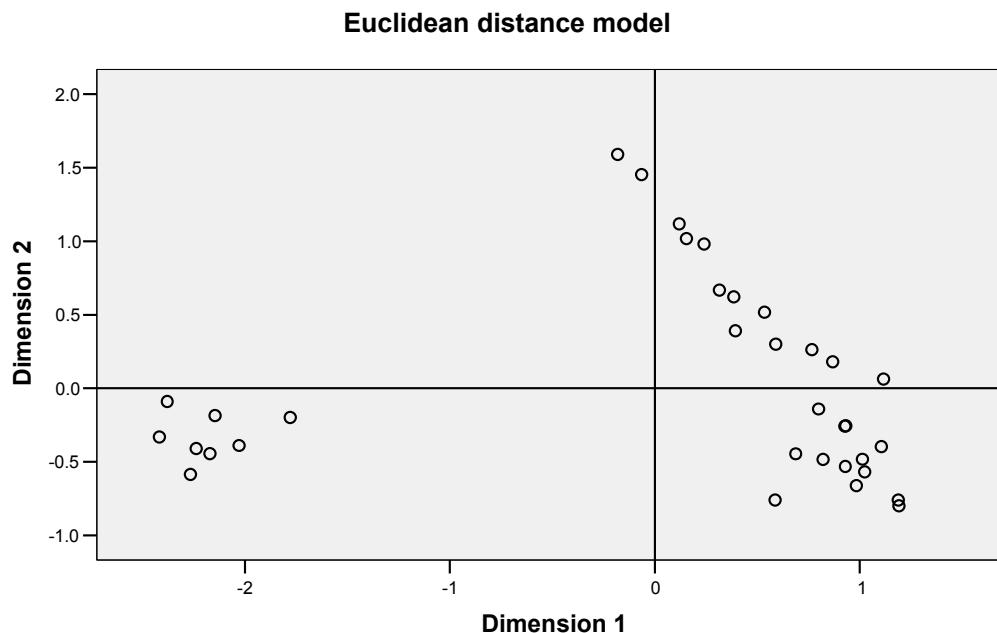


Figure 7.5. Clusters identified through MDS scaling of the pooled sample's sorting of the 34 newborn care behaviors.

Results obtained from selecting women who had a good correlation
From the two samples, we drew out women whose correlation with the final model
was more than 0.5. 9 of these women were peri-urban and 4 were rural. We ran the
model with only these women. As shown in Table 7.6 below, the results indicate that
including only the women who clearly understood the exercise did not improve the
level of f distortion by much (0.231 in 2 dimensions compared to 0.240 for the rural
women and 0.243 for the peri-urban women).

Table 7.7: Stresses obtained from the MDS for women with correlations $> .5$

Dimensions	Stress obtained	Comparison to Kruskall's (1964) informal guidelines
1	0.398	Poor
2	0.231	Poor
3	0.110	Fair
4	0.073	Good
5	0.046	Good

However, as shown in Figure 7.5 below, the “stability” of the feeding grouping is even more striking, and it now clusters tightly on the lower left hand side of the diagram.

As with previous figures, cluster membership was exactly as identified in Table 7.3.

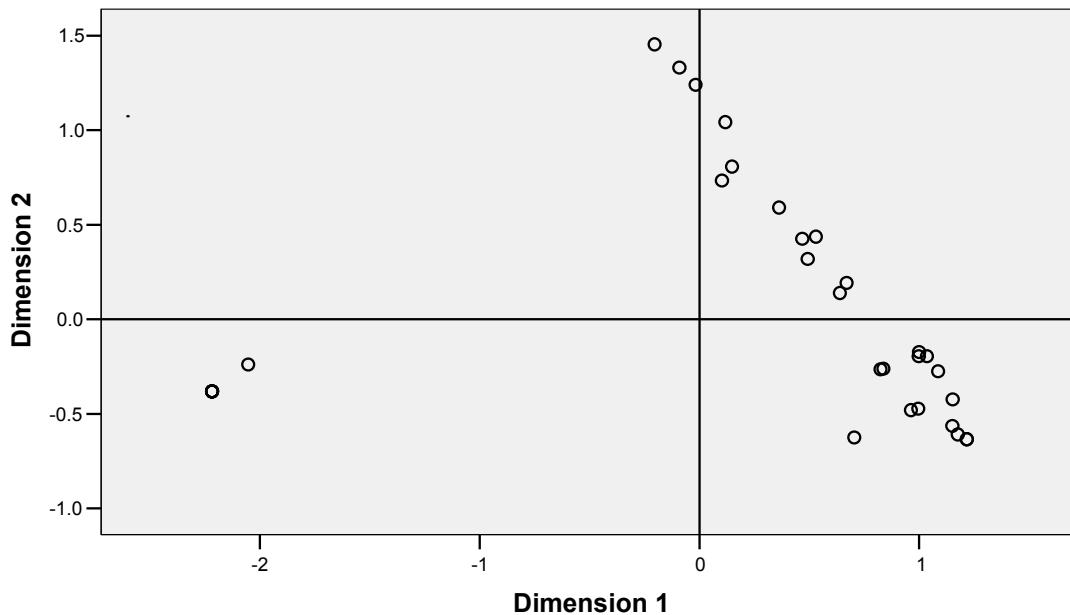


Figure 7.6. MDS plot of judged similarities among common newborn care-giving behaviors for the rural and peri-urban women whose correlation with the model was 0.5 and above (stress in 2 dimensions=0.240). Note that one grouping of behaviors is located at the lower left extremity of the first dimension.

Discussion

Methodological approaches

a) Similarities and differences between the two sites

In the previous chapter, we noted a subtle difference in beliefs about breastmilk substitutes for the two samples, and suggested that the difference could be attributed to levels of education. In this chapter, a striking finding is the “stability” of the feeding cluster for the two samples. This cluster is invariably separated from the other groupings along the first dimension, both for the rural and the peri-urban women. This finding confirms that the variability noted in the previous chapter is minor. It suggests that, prior to designing an intervention, it would be more useful to “check” the results obtained in new sites in the island, rather than replicating the entire study.

While both the peri-urban and the rural sample sorted the different items in a similar fashion, indicating that they have the same mental models, we noted sharp differences in the way they responded in the task. In comparison to the peri-urban sample, we found that the rural women tended to be less comfortable in expressing their views and to say “*I don’t know*” when asked to discuss why they sorted a group of items together. As one rural woman described her “I don’t know” answer:

“I don’t know, maybe you should teach us about this, and then when you come around again and ask us the same questions, we will give you the correct answer.”

Although we made an effort to let all women know that there were no wrong or right answers, and that we valued their knowledge, the rural women may still have doubted their own knowledge and capabilities and perhaps they preferred to say “*I don’t know*” rather than to risk saying something that was not “correct.” Differences in expressing themselves may also be due to differences in level of education. Almost all the peri-urban women had a high school level of education, and some of them were

formally employed. In contrast, only two of the rural women had a high school education and none of them was formally employed. Due to a lower level of formal education, rural women may not be used to questioning the “whys” in the life around them, and may be more “accepting” of things “as is.” Finally, rural women may be less exposed to things outside of the village. This latter situation is illustrated in the quote below from a 33 year old rural woman:

“I don’t know that my friend, tell us why this is done, some of these things we have never ever seen them.”

As illustrated in part D of the analysis, including only women who had clearly understood the pile sorting exercise did not improve the fit of the model as indicated by the level of stress. However, in the visual representation in Figure 7.4, the items included in the infant feeding grouping clustered more together (as indicated by the amount of overlapping) and do not spread out as much as they do when the whole sample is included. This suggests less “noise” when only the women with a higher correlation are included.

b) Labelling the groupings

As discussed in Chapter 4, labeling the groupings that result from the application of an MDS statistical procedure is partly an art (Andeberg, 1973). In this study, some respondents were able to clearly articulate their rationale for their groupings with labels that correspond very closely to the labels I have assigned. For example, one respondent explained, with reference to her grouping of items into a feeding cluster, “*this is what the baby eats and drinks.*” Another respondent explained “*and then we come to the foods, because we are told that babies should be fed, they should be breastfed until they are ready to drink porridge, I have put these together.*”

However, most respondents were not as articulate as the women above, and it was rare for an individual to be able to describe the underlying structure she had used

to organize her sorting. Some of the rationale for sorting can be inferred from the items themselves. It appears, for example, that some behaviors were grouped together on the basis of the physical location and the time in which they took place, so that giving birth in the hospital and vaccinating the baby were grouped together because they occur within the hospital setting at or near the time of delivery.

There was considerable ambiguity and looseness in the groupings with respect to the rationale for some of the behaviors. For example, for many of the peri-urban women, the practices of “*calling the baby to prayer*” and “*applying soot on the baby’s feet, palms and face*” were classified together because they were perceived to be “traditional” behaviors. In discussing their grouping decisions for these behaviors, women commented on their traditionality. On the other hand, some of the women chose to group the same behaviors as preventive care practices that are undertaken to prevent unfavorable outcomes for the infant.

It is not surprising that most women could not provide clear labels or concepts for their sorting. If everyone was articulate about their cultural knowledge there would be less utility for cognitive mapping exercises. But the consequence of the fact that people are able to sort, but not necessarily to provide an articulate explanation of their sorting, is that the analyst has to create labels that reflect his or her understanding of the *emic* picture. Although these are imposed by the investigator, they are not, technically, *etic* because they are based on the analyst’s understanding of the respondents’ grouping, rather than theoretical categories that originate from the analyst’s theoretical framework. For example, from an *etic* perspective I would have placed “*vaccination*” into the cluster of “preventive behaviors,” but from the perspective of women in Pemba, these are associated with activities around birth. Similarly, I would be inclined, from an *etic* perspective, to classify “*baby made to inhale smoke from burned Swahili medicine*” as a traditionally motivated behavior, but

the women in peri-urban Pemba tended to group it with the other behaviors that one engages in to cure illness, on par with not washing a sick baby in order to prevent him from being chilled.

Discussion of the results

Anthropological research on family care practices for childhood illness have often revealed that specific care practices are embedded within a larger conceptual structure about how illnesses should be managed. A medical recommendation to engage in or avoid a specific practice is often incomprehensible from the perspective of the family because it does not take into account this larger management structure (Pelto, Goodman and Dufour, 2000). In this study, we systematically examined the extent to which specific nutrition practices are embedded within larger conceptual structures, as this has significant implications for future interventions designed to encourage or to discourage families about engaging in certain care-giving practices.

The most striking finding from the MDS scaling is the coherence of a feeding cluster, which characterizes the cognitive mapping of women in both the peri-urban and rural samples. The cluster appears distinct even in low dimensions, indicating the “robustness” of the model obtained. In contrast to the other grouping, in which there is greater variability among the women in their conceptualizations about newborn care practices, there is no doubt that feeding is clearly a distinct behavioral area. This finding is particularly instructive from the perspective of designing interventions. From this result, it can be inferred that an intervention that focuses specifically on improving early feeding behavior could “stand alone,” without being integrated with other interventions to improve care of the newborn. This separation would fit with the local cultural understanding. In contrast, because other aspects of newborn care appear to “overlap” in respondents’ conceptual map, interventions to improve these may need to be presented as a holistic, integrated package in order to find resonance.

Limitations of the study

It is important to point out the limitations of this study. Firstly, the findings are based on the perceptions of mothers in two small convenience samples, and we cannot be sure that they fully reflect normative perceptions in Pemba. In particular, as a pre-requisite, so that they could read the short descriptions we had written on the index cards, all the mothers who completed the pile sorting exercise had to be literate. Because Pembans generally have a low level of literacy, this limits the extent to which the results of this study can be generalized to the Pemban population.

A second limitation, which characterizes all cognitive mapping techniques that utilize pre-determined items, is that the picture of the organization of neonatal care practices is constrained by the items the women were asked to sort. In this research, for all respondents, I chose to use a list of items that were based on prior key informant interviewing, rather than allowing respondents to come up with their own list of items that they felt were relevant to routine care of the newborn. While the use of pre-determined items ensured comparability across informants, it did not allow the identification of any new items by the informants and, for this reason, it may not have provided the most complete and exhaustive picture.

Conclusion

The finding in Pemba that care practices related to feeding are conceptually distinct is “good news” because it indicates that interventions can focus specifically on feeding without simultaneously addressing all aspects of newborn care. In contrast, the ambiguity about the discreetness of the other groupings suggests that these care practices are inter-related. Further research is needed to elucidate the nature of this inter-relationship and to understand its implications for interventions designed to improve other neonatal care-giving behaviors.

In this chapter I have illustrated the use of the pile sorting technique to understand the cognitive structure of neonatal care practices in Pemba. I have presented the results of the Multi-Dimensional Scaling analysis of the pile sorts, which is a visual representation of respondents' cognitive map. From the results of the Multi-Dimensional Scaling, I have discussed the implications of the finding that respondents conceptualized infant feeding behaviors as being distinct from other aspects of care of the newborn. I have highlighted the implication of this finding: interventions to improve care of the newborn can focus specifically on feeding without simultaneously addressing all aspects of newborn care. The next chapter is devoted to an exercise that was designed to assess how mothers of newborns in Pemba react to recommendations for improving neonatal feeding practices.

CHAPTER 8

FEEDING THE NEWBORN ON THE PEMBA ISLAND OF TANZANIA:

WOMEN'S BELIEFS, PRACTICES AND RESPONSES TO RECOMMENDATIONS

Objectives of the study

The primary objectives of the study were: a) to describe women's beliefs and practices related to newborn feeding, before and after delivery and b) to assess their reactions and responses to recommendations, the effects of which would support the practice of exclusive breastfeeding. To achieve these objectives structured ethnographic interviewing was conducted, augmented by a procedure that provided women with feeding recommendations, pre-delivery, and a postpartum follow-up to obtain their responses and opinions. The procedure—giving recommendations and then a follow-up assessment—was inspired by the TIPS (Trial of Improved Practices) concept described in Chapter 4. A description of the research setting (Pemba Island) is provided in chapter 6.

Methods

Sample selection

Generally, for open-ended interviews, there are no rules for sample size requirements (Weller and Romney, 1988; Patton, 1990). The TIPS protocol (Griffiths et al., 1997) proposes 10-15 individuals from each site or community, and a total of two-four sites. For this study we decided to obtain information from a group of respondents from one site. A sample of 30 was estimated to be sufficient based on the need to collect ethnographic information on feeding from the same sample (see chapters 6 and 7), we estimated that a well-chosen sample of 20 women would be adequate for those information needs. In contrast to the TIPS, we chose to focus on one field site and to obtain more depth, rather than studying a larger number of sites and obtaining breadth.

To be eligible to participate in the study, the first criterion for selection was that the respondent had to be in the “last weeks” of pregnancy. This criterion was intended to provide a sample of women in which we could obtain data about their intended feeding practices prior to delivery, provide them with new information before they gave birth, and observe their responses to this information after delivery.

Because it is difficult to obtain the expected date of delivery in Pemba from medical sources, for a woman to be considered to be “in her last weeks” of pregnancy, we relied on the woman’s anticipated delivery. Any woman who told us that she expected to deliver during the same month in which were interviewing or during the next month was eligible. The second criterion for eligibility was that the woman intended to spend her postpartum seclusion within the community in which the research was to be conducted.

We enlisted the help of a local nurse for the recruitment process. To identify eligible women, we first consulted a list of all pregnant women who had visited the main primary health care unit in the community (referred to as a “cottage” hospital). We then visited the women’s homes to find out if they were in their last weeks of pregnancy and if they intended to stay in the community for postpartum seclusion. To complement the hospital list, we also asked women to refer us to any of their pregnant friends and relatives who lived close by. Through this process, we identified a total of 30 eligible women. Of these, 83% were referred by the hospital nurse, while 17% were community-based referrals.

Interview procedures

A series of 3 interviews was scheduled with the women. The aim of the first visit—which took place during pregnancy—was to administer the basic ethnographic interview schedule and to find out women’s feeding intentions for their unborn child. In the second visit, which also took place during pregnancy, we presented the women

with four recommendations and the rationale for each one (see description of messages below). For each recommendation that did not correspond with their intended behavior, the women were asked whether they would be willing to try out the recommendation after the baby was born. In addition to their indication of willingness or unwillingness to try out the recommendation, we also recorded all comments the women made in relation to the recommendations, whether or not they were directly pertinent to the decision about trying or not trying them. During the third (postpartum) interview, we first ascertained what the mother had given the child since birth. We then asked about her experiences with the recommendations. The English translations of the questions asked of the women in all three interviews are outlined in appendices 8.1a, 8.2a, 8.3a. The Kiswahili versions can be found in appendices 8.1b, 8.2b, 8.3b.

Developing the messages

The recommendations that were presented to the women for their consideration were based on guiding principles of good feeding practices; the effect of putting all four into practices would help to ensure exclusive breastfeeding. We decided to limit the number of recommendations to 4, which we phrased as outlined in vignette 8.1.

Vignette 8.1: Recommendations provided to the women

Recommendation 1: *My first suggestion is not to give the baby any water to drink. People give the newborn water to drink because they believe he is thirsty. But you shouldn't give the baby water when he is still very young. When the baby breastfeeds, he is satisfied, he has already got enough water, so there is no need to give him water, especially when he is so young.*

Recommendation 2: *My second suggestion is not to give the baby feeds of milk, porridge, or other foods. People give the newborn feeds of milk or porridge because they think their milk is not enough and that the baby is still hungry. But you shouldn't give the baby these feeds when he is still very young. When the baby breastfeeds, he is satisfied, he has already got enough to eat, so there is no need to give him these, especially when he is so young.*

Recommendation 3: *My third suggestion is to feed the baby frequently [mara kwa mara], at night and during the day. People think that the newborn should eat at the same time as adults eat. But you shouldn't give the baby food only when you are eating. Compared to adults, babies have small stomachs and they cannot store a lot of food. That is why they need to be fed very frequently, even at night.*

Recommendation 4: *My fourth suggestion is to begin breastfeeding the baby immediately after he is born, before 2 hours are over. Newborn babies are unable to keep themselves warm. For this reason, immediately after the baby is born, he needs to get warmth from his mother. During breastfeeding, the baby is close to his mother's body, this allows him to get warmth. Also, the break down of the milk in the baby's body releases heat, and allows the baby to keep warm.*

I have provided you with these 4 options, you can choose to try one, two or three for one week from the time when your baby is born. After your baby is born, in our last interview, I will ask you what your experience was while trying the recommendations.

The information that we included for each priority behavior included instructions on what to do, as well as the motivating rationale. In formulating the messages, our guiding principles were that they should be positive, motivational, non-threatening, and should, to the extent possible, reinforce mothers' existing knowledge about breastfeeding (Griffith et al., 1997). Messages were tied to popular notions about feeding the newborn, which was facilitated by our earlier ethnographic work. For example, in the ethnography, although the majority of women noted that giving the newborn water to drink was motivated by the belief that he was "thirsty," a minority of women responded in ways which are compatible with current recommendations for exclusive breastfeeding. It was apparent that some mothers already knew that water is unnecessary and that this was already part of the pool of "cultural knowledge," even

through that knowledge was not widely shared.

Obtaining measure of exclusive breastfeeding

In addition to information on what women intended to do, it was also important to have a valid measure of whether they practiced exclusive breastfeeding as this is the ultimate goal of any intervention aimed at improving neonatal nutritional care under normal circumstances. We used the strict WHO definition of exclusive breastfeeding (see Table 2.1) i.e. with the exception of breastmilk and medically prescribed treatments, no other foods or liquids were introduced into the infant's diet.

To generate as many responses as possible with regard to women's feeding intentions prior to delivery, we chose to use two open-ended, non-threatening questions as follows: "*Now I am going to ask you about all the liquids you intend to feed your baby when he is born, please tell me all that you the liquids intend to feed your baby, including breastmilk, water, fruit juice, anything*" and "*Now I am going to ask you about all the foods you intend to feed your baby when he is born, please tell me all that you the foods intend to feed your baby, anything*." Mentioning any other foods or liquids apart from breastmilk was considered an intention not to exclusively breastfeed.

In the previous ethnographic research reported in chapter 6, we had identified common foods and liquids given to newborns in the community and used these results to develop a measure of exclusive breastfeeding for the third (post-partum) interview. Because the items generated in response to the open-ended questions were similar to those previously identified, we were able to validate this critical part of the interview instrument. This allowed us to ask a specific, close-ended question to ascertain the practice of exclusive breastfeeding. The question to measure exclusive breastfeeding was framed as follows: "*Since your baby was born, have you given him/her any of the following: Biscuits softened with tea, milk or water; plain water; water with glucose;*

gripe water; traditional (oral) medicine such as tonga, vichukio or kachiri; honey; shubili; cow's milk; powder milk; breast milk; dates and; porridge made of corn flour?" Have you given him anything else? (if yes: please specify).

Interviewer training

For the study, I was assisted by three interviewers. One of the three was a trained nurse-midwife. She was a 25-year old, unmarried woman with no children who described her ethnic origin as "Arab." In my view, she was an upper-middle class Pemban woman as evidenced by her own and her parents' level of education (post-secondary). The other two interviewers had a secondary school education, but had not pursued their education further. They were both 23-year old, they were divorced, and they were each responsible for a child from their previous marriages. They both described their ethnic origins as "Swahili." In my view, the two interviewers constituted lower-middle class Pemban women. Any differences they had with the rural women we interviewed were not as obvious as with the first interviewer. Because the two interviewers matched the respondents well, and were less likely to intimidate the respondents due to large differences in social class, they interviewed they vast majority of respondents (26 out of 30). In addition, because they understood the respondents well, there were excellent resources for interpreting the results of the interviews.

In order to reduce the potential distortions that are introduced by having interviewers who are external to the community I selected interviewers from the community in which the research was conducted. Presumably, this selection ensured that interviewers were sensitive to the culture of the people we were working with and also that they were knowledgeable about the geography of the area.

Because it was important to reduce interviewers' potential to affect responses, interviewer training was an important component of the project. Following the

recommendations of Babbie (1997), training included the following key features:

1) Knowledge about the study

The training session began with a description of what the study was about. Although the interviewers were only involved in the data collection phase of the project, it was useful for them to understand what was to be done with the interviews they conducted and what purpose would be served. Allowing them to know what was going on may also have improved their morale and motivation for the study.

2) Familiarity with the interview guides

Following the description, a significant amount of effort was spent in ensuring that interviewers were familiar with each of the questions they asked. To achieve this goal, demonstration interviews were conducted in which interviewers were asked to role play, as if they were in an actual interview setting. During these demonstrations, interviewers were encouraged to read out the interview guide as naturally as though they were conducting an informal conversation, while following exactly the same language as was set down in the interview guide.

3) Recording responses: note-taking and tape-recording

During training, the importance of recording responses was also emphasized. To this end, two interviewers were asked to carry out a practice interview, with one interviewer playing the role of a respondent. In the exercise, the other interviewers practiced using the tape-recorder while jotting down notes on the interview guide.

4) Probing for responses

To anticipate cases where respondents required more information to answer a question, interviewers were taught to use neutral probes that did not in any way affect the nature of the subsequent response. To this end, training emphasized the importance of obtaining the respondent's own view, and on the use of open-ended rather than closed ended probes.

5) Ordering of questions

Because the order of the questions can affect responses, to ensure that all respondents were provided with the same stimulus, the importance of asking questions exactly as they were ordered in the interview guide was emphasized during interviewer training.

6) Other components of interviewer training

To ensure that interviewers were comfortable providing breastfeeding information to mothers, during training, interviewers watched and discussed two videos on breastfeeding (University of Leeds, 199-; videovital, 199-; Breastfeeding and development, 199-). In addition to emphasizing the importance of being pleasant, relaxed and friendly with respondents, during training, interviewers gained other skills that were critical to the success of the study, such as being well organized, being on time and not making promises to respondents that they could not honor.

Data analysis

All interviews were tape-recorded in the language in which they were conducted (Kiswahili), then transcribed and translated into English. Recordings were transcribed using standards required for conversation analysis, which includes notation of hesitations, pauses in conversation and laughter (Seale and Silverman, 1997). In consultation with the interviewers, I reviewed each transcript, noting additional items, marking discrepancies and making further notes and adjustments.

Results

The findings from the study are presented here in terms of the women's beliefs and practices with regard to their experiences in feeding their newborns. Where tables are utilized to expand a specific finding, the number of women concerned is indicated in relation to the total sample. This allows an assessment of the extent to which a belief or a practice is widespread. For example, a belief generated by all 30 respondents (or a practice in which all 30 respondents engaged) can be considered pervasive,

compared to something concerning only one or two respondents. In addition, the beliefs and practices are not mutually exclusive. In other words, a mother can express more than one belief or engage in more than one practice, for example, as shown in table 8.3 that follows, a mother could have given water to her newborn, as well as cow's milk.

Characteristics of the sample

All the women were Muslim, and all were from the Swahili ethnic group. The mean age was 30, with a range of 18-40. Three of the women were under 20. The mean number of children was about 5 and the mean age of newborns at the time of the third (postpartum) interview was 5.5 days. At some point during their reproductive lives, almost a third (31%) of the women had experienced the death of at least one child and, during the study, 2 of the 26 newborns died within 28 days.

Roughly half of the women (46%) delivered at home, and most of these deliveries were assisted by a Traditional Birth Attendant (TBA). Only 23% observed the practice of post-partum seclusion in their natal household, the rest chose to be secluded in their own homes. The women were generally not well off: roughly half of the sample lived in huts thatched with dried coconut leaves; a half of the sample had no mode of transportation; and the vast majority of the women accessed water from a communal well; only 8% had been to secondary school and only half of the sample was literate.

The women's demographic characteristics are summarized in Table 8.1. Figure 8.1 below summarizes the number of women who participated in each of the three interviews and the main activity which took place at each interview.

Table 8.1: Demographic characteristics of the sample (n=30)

Mean age of mothers in years (range)	30(18-40)
Mean number of children (range)	5(0-9)
Average age of newborn in days (range)	6(2-20)
% women who had 1 or more children die	31%
Place of delivery	Home deliveries
	Hospital deliveries
Person assisting with delivery	Assisted by TBA (Traditional Birth Attendant)
	Assisted by doctor or nurse
	Family member
	Other/don't know
Postpartum seclusion	Her natal home
	Her own home
Average number of individuals living in household (range)	6(2-10)
Type of roofing	Roof made of makuti (dried coconut leaves)
	Roof made of corrugated iron sheets
Means of transportation	No means of transportation
	Bicycle
	Motorcycle and/or car
Source of water	Access to water from a communal tap
	Access to water from a well
Level of education	% no schooling
	% primary school
	% secondary school
% literate (could read short descriptions written on visual aids)	50%

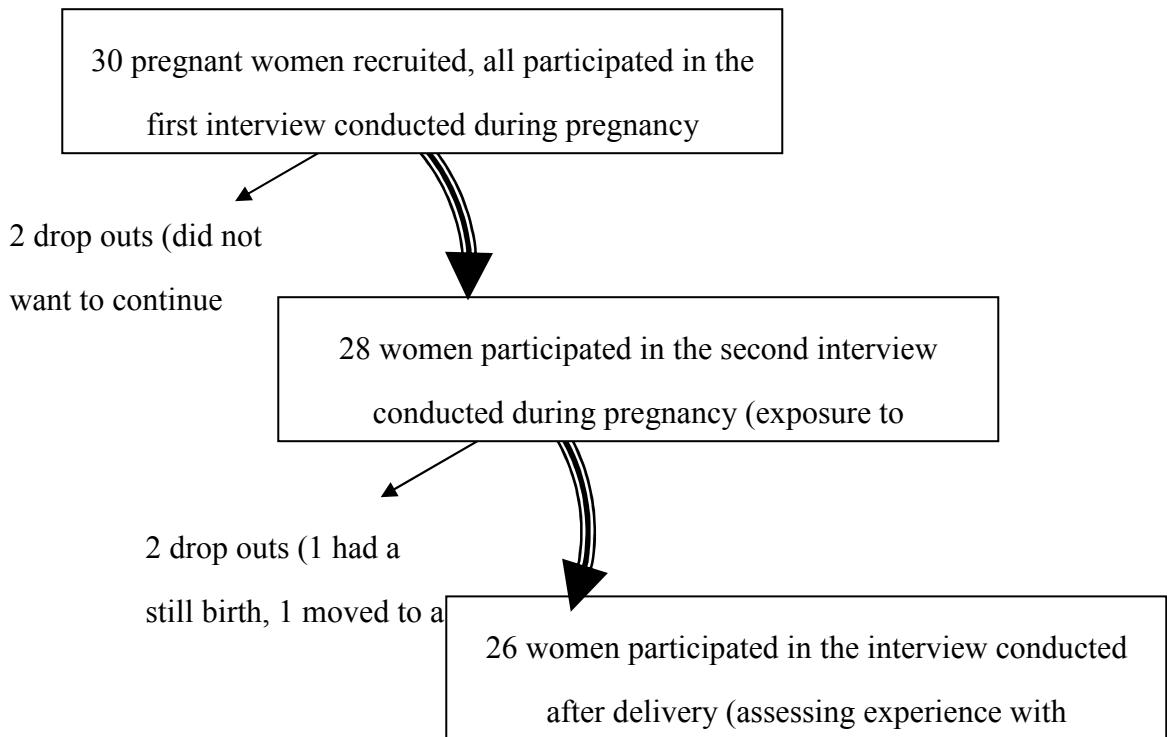


Figure 8.1: Number of women who participated in each of the three interviews
Beliefs about breastmilk and breastfeeding and feeding intentions prior to delivery

As described in chapters 6 and 7, the perception that “breastmilk is natural” was very strong. Mothers perceived breastfeeding as a “normal” behavior, and as a way to transmit good health and nutrition to their babies. This compares favorably with biomedical discourse on breastfeeding, in which the practice is viewed as conferring nutrition and health benefits for the baby. The list of statements about breastmilk and breastfeeding included: “*Breastmilk is his right*”; “*Babies are created wanting to breastfeed*”; “*I will breastfeed the baby because he will be hungry, and he needs to grow, apparently without food a human being cannot live*”; “*Breastmilk is what a baby eats*”; “*Breastmilk is good for babies*”; “*A baby is not able to eat anything else*”; “*Breastmilk is important for the baby*”; “*Breastmilk helps*”; “*Breast milk is enough, I*

can see that he is not hungry and he is not crying.”

When asked about their feeding intentions after delivery, all of the 30 pregnant women reported that they intended to breastfeed. When asked how often they intended to breastfeed, 19 of the women (63%) intended to breastfeed “on demand,” 6 of the women (20%) intended to feed the newborn according to a given schedule (for example 3 times a day) while 2 (7%) did not know how often they intended to breastfeed. Data were missing for 3 of the women. When asked how soon after delivery they intended to breastfeed, 9 of the women (30%) mentioned that they intended to initiate breastfeeding immediately after delivery. Breastfeeding intentions are summarized in Table 8.2 below.

Table 8.2: Mother’s breastfeeding intentions

Breastfeeding intentions	Number of respondents	% out of N ₂ =30 pregnant women
Intend to breastfeed	30	100%
Intend to breastfeed exclusively	1	3%
Intended breastfeeding frequency	“On demand”	63%
	“According to a schedule”	20%
	“Don’t know”	7%
	Missing	10%
Intentions for breastfeeding initiation	Will initiate breastfeeding “immediately after delivery”	30%
	Other time period given	70%

Although mothers recognized the importance of breastfeeding, they did not intend to do so exclusively. Mothers expected to add fluid substitutes, such as water (plain or sweetened with glucose), juices, cow’s milk, infant formula and tea to their infant’s diet well before he was one week of age. Beyond one week of age, mothers intended to give newborns biscuits (softened with milk, water or tea), porridge, soup, cassava, eggs and mangoes. Table 8.3 summarizes the breastmilk substitutes, the motivations, and the number of mothers who intended to give the substitutes.

Table 8.3 Breast milk substitutes that mothers intended to give to newborns

Breast milk substitute	Examples of mothers' motivations for giving these substitutes to their newborns	Number of respondents who mentioned substitute*	% out of N ₂ =30 pregnant women
Plain water**	<i>"This is what we are told, if you do not drink water, you cannot be a human being"</i> or <i>"In the same way that I feel thirsty, I think he is also thirsty"</i>	21	70%
Cow's milk	<i>"I will give him cow's milk because he will be hungry and because I have nothing in my breast"</i> or <i>"So that he becomes healthy"</i> or <i>"It will help him, I cannot afford anything else"</i>	13	43%
Porridge	<i>"This is what a baby eats"</i> or <i>"It helps"</i> or <i>"It satisfies the baby"</i>	12	40%
Biscuits (softened with milk, water or tea)	<i>"Because these are foods for young infants, this is what they are able to quickly eat"</i> or <i>"They will help him, at least a little, and they will allow the mother to rest a little"</i> or <i>"If the baby cries a lot"</i>	10	33%
Juices	<i>"Juices will help him"</i>	2	7%
Cassava	<i>"This is what I will be able to provide"</i> or <i>"He will be hungry"</i>	2	7%
Eggs	<i>"To build his body"</i> or <i>"Doesn't this help his body?"</i>	2	7%
Tea	<i>"So that his stomach is calmed"</i>	2	7%
Soup	<i>"Soup will help the baby"</i>	1	3%
Infant formula	<i>"Because I do not have enough milk, my milk is too little"</i> or <i>"I don't know"</i>	1	3%
Mangoes	<i>"Because he will be hungry"</i>	1	3%

* Each respondent could mention more than one breastmilk substitute

**2 of the respondents who intended to give their unborn babies water mentioned that they would sweeten the water with glucose

With the exception of water, the majority of mothers expected the baby's father to provide items such as cow's milk, porridge and biscuits. Mothers' anticipations with regard to the provider of breastmilk substitutes are summarized in table 8.4 below.

Table 8.4: Anticipated provider of breastmilk substitute

Breast milk substitute	Person anticipated	Number of respondents	% out of those who mentioned substitute*
Plain water	Mother	13 out of 21*	62%
	Grandmother or whoever is near the baby	3 out of 21	14%
	Response missing/Not mentioned	5 out of 21	24%
Cow's milk	Mother	3 out of 13	23%
	Father	8 out of 13	62%
	Grandmother or whoever is near the baby	1 out of 13	8%
Porridge	Mother	3 out of 12	25%
	Father	7 out of 12	58%
	Grandmother or whoever is near the baby	2 out of 12	17%
Biscuits (softened with milk, water or tea)	Father	7 out of 10	70%
	Response missing/Not mentioned	3 out of 10	30%
Juices	Father	2 out of 2	100%
Cassava	Father	2 out of 2	100%
Eggs	Father	1 out of 2	50%
	Grandmother or whoever is near the baby	1 out of 2	50%
Tea	Mother	2 out of 2	100%
Soup	Father	1 out of 1	100%
Infant formula	Father	1 out of 1	100%
Mangoes	Father	1 out of 1	100%

* Out of those who had mentioned the particular substitute, also see table 8.3

Exposure to the recommendations

As shown in figure 8.1 above, of the 30 pregnant women recruited, 2 dropped out of the study after the first interview. Therefore, only 28 women participated in the

second interview. While the four recommendations were presented to all 28 women (i.e. all 28 were “exposed” to the recommendations) we were interested in women who had the potential to accept to try a given recommendation. This potential was defined as having an infant feeding intent that was discrepant with the recommendation. For example, as shown in Table 8.5 below, with the exception of one woman, all 28 had intended to give their newborns something other than breastmilk to eat or drink. Because the 27 women’s intentions did not match the recommendation not to give breastmilk substitutes, these 27 had the potential to try the recommendation. 19 of the 28 women intended to give water to their babies, these women could potentially try the recommendation not to give the baby any water to drink. Only 10 women initially indicated that they did not intend to breastfeed on demand, these were the only individuals who could potentially try breastfeeding on demand, and whose information was analyzed in relation to the recommendation. Finally, 21 of the 28 women did not intend to initiate breastfeeding immediately after delivery and, for this reason, they were included in the analysis of the recommendation to initiate breastfeeding within two hours after delivery. In this chapter, the analysis is limited to mothers whose stated infant feeding intent was discordant with the recommendations.

Table 8.5: Eligibility for exposure to recommendation

Summary of recommendation	Discrepancy with recommendation	Number of women who could potentially try out recommendation
Breastfeeding on demand	Women who did not intend to breastfeed on demand	10
Avoiding to give the baby water to drink	Women who intended to give their babies water to drink	19
Avoiding to give the baby any foods or liquids, with the exception of breastmilk	Women who intended to give their babies any foods or liquids	27
Initiating breastfeeding within 2 hours of delivery	Women who did not intend to initiate breastfeeding immediately after delivery	14

1) Choice to try the recommendations provided

In this section, I describe the mothers' responses (positive and negative) to the recommendations provided and their statements in response to the recommendations. The first column in Table 8.6 lists the four recommendations. The second column gives the number of women who were exposed to the recommendation, while the third gives the numbers (and percents) of women who agreed to try the recommendation prior to delivery. The fourth column shows the number who succeeded in trying the recommendation they had chosen after the baby was born.

Table 8.6: Number of mothers who chose to try each of the recommendations

Recommended behavior		N exposed to recommendation	N who chose to try (%)*	N who succeeded in trying recommendation (%)**
3	Breastfeed on demand	10	10 (100)	7 (70)
4	Initiate BF within 2 hours of delivery	14	14 (100)	11 (79)
2	Not to give other foods and liquids with exception of breastmilk	27	20 (74)	19 (95)
1	Not to give water	19	11 (58)	5 (45)

* Proportion of those who agreed to try in comparison to those exposed to the recommendation

**Proportion of those whose practice after delivery was consistent with what they had agreed to try before they delivered

As shown in the above table 8.6 above, prior to delivery, the recommendation not to give the baby any water to drink was the least popular. In contrast, all the mothers who had not initially indicated an intention to feed their baby on demand agreed to try feeding the baby as often as he liked. The same was true for initiating breastfeeding within two hours after the baby's birth, and the majority was also willing to try not to give other foods and liquids. The section below describes the statements that women made in answer to our questions about why they were willing

to try (or not to try) each of the recommendations.

- a) Initial agreement to try the third and fourth recommendations

All 10 mothers who were exposed to the recommendation concerning breastfeeding on demand agreed to try it out. This suggests that feeding on demand fits well with local cultural understandings of infant feeding. The comments on why women found this recommendation acceptable are summarized in Table 8.7. As can be seen in the quotations, many of the comments did not focus directly on the “on demand” aspect of the recommendation, but emphasized, instead, the positive features of breastmilk as “baby’s food” as well as concerns for the newborn’s wellbeing.

Table 8.7 Mothers’ motivations for choosing to breastfeed on demand

Motivations for choosing to breastfeed on demand	Number of mothers expressing this view**
“Because the baby is not old enough to eat or drink anything else”	3 out of 10*
“So that he becomes healthy”	1 out of 10
“So that he is satisfied”	2 out of 10
“Breastmilk is his fruit, he was created with it”	1 out of 10
“Because breastmilk is enough for the baby”	1 out of 10
“I don’t know”	2 out of 10

* 10 mothers had chosen to breastfeed on demand

** With the exception of “I don’t know” the motivations are not mutually exclusive, each of these respondents could generate more than one motivation

The fourth recommendation concerning initiating breastfeeding within two hours of delivery was also popular—the option was accepted by all 14 mothers to whom it was presented. Women’s reasons for choosing to initiate breastfeeding within two hours of delivery included: “*when babies are born they want to eat immediately*” or “*it is our tradition to breastfeed the baby as soon as he is born.*” The comments are summarized in Table 8.8.

Table 8.8 Mothers' reasons for choosing to initiate breastfeeding within two hours of delivery

Motivations for choosing to initiate breastfeeding within two hours of delivery	Number of mothers who expressed this motivation**
“Because breastmilk is his only source of food”	3 out of 14*
“It is our tradition to breastfeed the baby as soon as he is born”	3 out of 14
“When babies are born they want to eat immediately”	2 out of 14
“So that the baby gets the mother’s heat”	1 out of 14
“Because of the state of his stomach, there is nothing inside, it is a new stomach”	1 out of 14
“So that the baby becomes healthy”	1 out of 14
“I don’t know”	1 out of 14

* N=14 mothers who had chosen to initiate breastfeeding within two hours of delivery

** With the exception of “I don’t know” the motivations are not mutually exclusive, each of these respondents could generate more than one motivation

b) Statements concerning choosing to try not giving other foods and fluids

In the first interview conducted prior to providing the recommendations, 27 of the women had intended to give their infants other foods and liquids. After exposure to the recommendation not to give the baby any other foods or liquids, 20 women (74%) of these women chose to change their intentions based on the information we had provided. In explaining their motivations for following our recommendation, most mothers referred to the concept of the baby’s developmental stage. In particular, mothers suggested that a baby’s stomach is still “small” and that, for this reason, with the exception of breastmilk, babies are unable to digest other foods and liquids.

Example “*because the baby’s stomach is small, and he cannot yet digest heavy foods.*” Mothers also believed that breastmilk as “*the ideal food for baby.*” Example: “*Because milk is enough for the baby.*” Mothers’ motivations for agreeing to limit the infant’s diet to breastmilk are summarized in Table 8.9.

Table 8.9 Mothers' motivations for choosing not to give babies other foods or liquids

Motivations for choosing not to give their babies any other foods or liquids	Number of mothers who expressed this motivation**
<i>“Because the baby is too young to eat other foods” or “The baby’s stomach is small, and he cannot yet digest heavy foods”</i>	15 out of 20*
<i>“Because milk is enough for the baby”</i>	8 out of 20
<i>“Sometimes I don’t have those other liquids, if I make him get used to them, I will stress myself out when I do not have them”</i>	2 out of 20
<i>“These will not be good for him, they will “disturb” him”</i>	1 out of 20
<i>“I will not give him any other foods or liquids because I will follow the advice that you have given me”</i>	1 out of 20
<i>“I don’t know”</i>	1 out of 20

* N=20 pregnant women who had chosen the second recommendation

* With the exception of “I don’t know” the motivations are not mutually exclusive, each of these respondents could generate more than one motivation

c) Statements concerning choosing to try not giving water

Prior to delivery, 11 of the 19 women (58%) who were exposed to the recommendation not to give the baby any water to drink chose to try out our advice. In their discourse about not giving the baby any water to drink, most mothers referred to the concept of breastmilk being “sufficient” for the baby. Example *“Because my breast milk will be enough.”* Another explanation women provided for their willingness to try the recommendation is that they trusted the information we had provided to them: *“Because this is what the professionals have advised us.”*

Statements related to choosing the recommendation are summarized in Table 8.10.

Table 8.10 Motivations for choosing the recommendation not to give the baby water

Motivations for choosing the recommendation not to give the baby any water to drink	Number of mothers who expressed this motivation**
<i>“Because my breast milk will be enough” or “Milk helps the baby”</i>	5 out of 11*
<i>“I did not know that babies should not be given water to drink but now I know, so I will try it out”</i>	3 out of 11
<i>“I don’t know”</i>	2 out of 11
<i>“Because the baby is not old enough to drink water”</i>	1 out of 11

* N=11 pregnant women who chose the first recommendation

* With the exception of “I don’t know” the motivations are not mutually exclusive, each of these respondents could generate more than one motivations

On the other hand, a pervasive theme in the comments of the 8 pregnant women who chose to reject the recommendation was the belief that “human beings need water to survive.” Women who rejected the recommendation stressed the extreme nature of their infants’ thirst. Examples: “*Eating and drinking go together, for this reason, if he breastfeeds, he eats, so he must drink water*” or “*My heart tells me that babies cannot go for long periods without being given water to drink.*” Women’s reasons for rejecting the recommendation concerning water are summarized in Table 8.11.

Table 8.11 Reasons for not agreeing with the recommendation to forego giving water

Reasons to reject recommendation not to give water	Number of mothers who expressed this view**
Human beings need water to survive	3 out of 8*
“ <i>Water is not like any other drink, it will only be water</i> ”	1 out of 8
“ <i>Because he will want to drink water all the time</i> ”	1 out of 8
“ <i>I have no breastmilk</i> ”	1 out of 8
“ <i>It is as I explained to you, I may not give the baby water to drink, but if I am not there, someone else may give him water</i> ”	1 out of 8
“ <i>I don’t know</i> ”	1 out of 8

* N=8 pregnant women who chose not to try the first recommendation

** With the exception of “I don’t know” the beliefs are not mutually exclusive, each of these respondents could generate more than one belief

Feeding practices reported by mothers after delivery

In this section, I present the results that were obtained at the postpartum interview, which took place 5-20 days after delivery, with the majority occurring during the first week. As shown in figure 8.1 above, this postpartum interview was conducted with the 26 women who were still in the study at the time of the third interview.

The information on what the baby was being fed was obtained from the mothers first. Then they were asked about their experiences with the recommendations. Table 8.12 presents the information that was given in response to

our query about feeding practices and what the baby had received.

Table 8.12 Newborn feeding practices in the sample

Infant feeding practice		Number of mothers	% out of N= 26 newborn babies
Breastfeeding initiation	Initiated immediately after delivery	12	46%
	Initiated a few hours after delivery	9	35%
	Initiated the next day	1	4%
	Other time period (“That night,” “that same day,” “after I had taken a shower,” and “a quarter of an hour later”)	4	15%
Total breastfeeding initiation		26	
Newborn feeding pattern	Newborn exclusively breastfed	11*	42%
	Newborn given breastmilk substitutes	Water to drink	15**
		Cow’s milk, biscuits or infant formula	7**
Breastfeeding “on demand”		26	100%

* A newborn who is considered exclusively breastfed did not receive even a drop of water

** Water, cow’s milk and other breastmilk substitutes are not mutually exclusive, a newborn could have received both water and, for example, biscuits

Experiences with Recommendations

Recommendation 2: Not to give newborn any other foods and liquids except breastmilk

Prior to delivery 3 of the 7 women who introduced other foods (cow’s milk, biscuits or infant formula) to their infant’s diet had said they would be willing to try not to introduce breastmilk substitutes to the newborn’s diet. In justifying their behavior, these three women recounted stories related to the newborn’s cues, such as crying or being hungry. One 32-year old woman who had given her newborn biscuits and water mentioned that the baby was “hungry.” The other, a 20-year old woman who had given biscuits, cow’s milk and water to her newborn reported that the newborn was

“thirsty,” (to justify water) “hungry” (to justify biscuits) and “crying a lot” (to justify cow’s milk). The third, a 40-year old woman, explained that the baby could not breastfeed because he too “tired” when he was born and he was “crying” this was why she gave him cow’s milk and water (also see vignette 8.4).

Initially 20 women had agreed to try the recommendation concerning not giving other foods and fluids, and 17 were following the recommendation at the time of the third interview. These women gave a number of explanations for their behavior in response to our query. Their reasons are summarized Table 8.13.

Table 8.13: Reasons for trying the second recommendation

Motivations for trying the 2 nd recommendation	# of responses*	%
Issues related to the baby: “ <i>Because his stomach is small</i> ” or “ <i>he does not yet need these foods and liquids</i> ”	11	65
Issues related to the mother: “ <i>Because I don’t have other foods and liquids to give to him</i> ” or “ <i>Because my milk is enough</i> ” or “ <i>Because I don’t usually give my babies other foods and liquids</i> ”	2	12
Issues related to the information received: “ <i>I am following the advice you gave me</i> ”	2	12
“ <i>I don’t know</i> ”	2	11
Totals	17	100%

* N=17 mothers who were trying out the second recommendation at the time of the third interview, each mother generated only one response

As shown in Table 8.12 above, 15 women reported that they had given their newborn water. Of these 15, 6 had initially agreed to try not to give water. In justifying their lack of adherence, women appeared to highlight the physical, as opposed to the volitional, reasons for introducing water. For example, some of the women indicated ways in which their desire not to give the newborn water was thwarted by the inefficiency of their bodies, relating the introduction of water into the infant’s diet to their inability to produce sufficient milk. Example: “*I gave him water because I have no milk.*” The statements provided by the 6 women are summarized in table 8.14 below.

Table 8.14 Statements to justify giving the baby water

Beliefs	# of responses	%*
Issues related to the baby: " <i>In the same way I feel thirsty, the baby also feels thirsty</i> " or " <i>It is impossible for a baby not to drink water</i> " or " <i>For a human being, water is life</i> " or " <i>He was not breastfeeding because he was very tired when he was born</i> "	3	50%
Issues related to the mother: " <i>I gave him water because I have no milk</i> " or " <i>Because my health is not good</i> "	2	33%
<i>"I forgot your recommendation"</i>	1	17%
Totals	6	100%

* Out of N=6 mothers who chose rec'd 1 but did not try it, each mother generated 1 response

On the other hand 5 of the 11 women who agreed not to give the baby water were successful in avoiding this practice. Their explanations for avoiding this behavior relate to their belief in our capacity to provide helpful advice and are summarized

Table 8.15 below.

Table 8.15: Explanations for trying the recommendation not to give the baby any water to drink

Reasons for not giving water	# of responses*	%
<i>"Mother's milk is enough"</i>	3	38%
<i>"Because you told us not to"</i>	2	25%
<i>"Because he has not yet become thirsty"</i>	1	12%
<i>"Because breastmilk contains water"</i>	1	12%
<i>"I don't know"</i>	1	13%
Totals	8	100%

* Out of N=5 women who succeeding in trying the recommendation not to give baby water to drink, the explanations were not mutually exclusive, each of these respondents could generate more than one motivation

Variability in response to the recommendations not to give the baby any water

to drink, and not to give the baby any foods or liquids apart from breastmilk

Although our sample size is very small, and none of the differences are statistically significant, there are some intriguing patterns in the characteristics of women who tried the first and the second recommendations compared to those who did not.

Because the third and the fourth recommendations were accepted by virtually all the women who had the potential to try it, this variability was not observed. The patterns observed included the potential importance of the mother's age, her previous

experience with the death of a child, her socio-economic status, and the type of relationship she had contracted with her husband (monogamous or polygamous). We also found that the interviewer may have affected mothers' willingness to try the recommendations.

A) Recommendation 1, regarding water

1) Age and success in trying out recommendation regarding water

From table 8.16 below, it appears that the youngest and the oldest women were less successful in trying out the recommendation to avoid giving the newborn water. Of the 4 women who failed in trying out the recommendation, 1 was 20 years old, the other three were aged 37-40. In contrast, almost all the women aged 28 to 35 years of age were successful in trying out the recommendations that they had chosen to try.

Table 8.16: age and success in trying out recommendation not to give water

Age in years	Number who failed in trying recommendation	Number who succeeded
20	1	0
21	0	1
28	0	2
30	0	1
31	0	1
34	0	1
35	0	1
37	1	0
40	1	1
Total	3	8

Perhaps, compared to women aged 28-35, the youngest woman was less autonomous in her decisions, probably because she was secluded in natal homes where she was under the influence of her own mother. However, compared to women aged 28-35, for the oldest women (aged 47 and 40 respectively), the difference may not be attributable to authority and autonomy in infant feeding decision making. Since these older women had more child rearing experience (as evidenced by the number of children they had) and they were secluded in their own homes, they may have been

fairly autonomous in making their own decisions. Rather, the oldest mothers may have been too “set in their ways” to be able to make the changes to infant feeding practice that we had proposed. The following section summarizes the other patterns observed.

2) Previous death of a child and willingness to try recommendation

Women who had experienced the death of a child were more willing to try out the recommendation not to give the baby any water to drink compared to those who had never experienced such a tragedy: 4 of the 5 women (80%) who had also experienced at least one previous death agreed to try this recommendation, compared to 6 of the 11 women (54%) who had never experienced a child death.

3) Education, literacy, and recommendation concerning water

Women’s level of education and literacy appeared to be associated with willingness to try the recommendations concerning water and other foods and fluids, and success in carrying out the decisions initially made. Only 2 out of 5 (40%) of those who had never gone to school chose to try out the recommendation, compared to 4 out of 6 (67%) of those who had a primary school level of education or higher. By asking women to read the short descriptions of newborn care-giving practices written on index cards (see chapters 5 and 6) we were able to assess whether or not a woman could read—regardless of the level of education she reported. As with education, women who could not read appeared to be less receptive to the first recommendation. Only 4 out 8 (50%) chose to try avoiding giving water to the newborn to drink, compared to 8 out of 10 (80%) of the women who could read.

**4) Hospital deliveries and success in trying out recommendation
concerning water**

Hospital deliveries appeared to be positively associated with success in carrying out the first recommendation. Compared to the two women who delivered at home, of

whom only 1 out of 2 (50%) was successful in carrying out the recommendation concerning water, 6 out of 7 (86%) of the women who delivered at the hospital succeeded in carrying out their decision.

5) *The type of marriage relationship and the first recommendation*

The nature of the relationships (polygamous or monogamous) that women are in appears to influence their success in carrying out the first recommendations. In contrast to only 2 out of 4 (50%) women who were in polygamous relationships and who were successful in carrying out their decisions regarding water, 6 out of 7 women (86%) who were in monogamous relationships were successful. Perhaps, because polygamous households tend to be larger, women may encounter more interference with their infant feeding decisions, giving them less autonomy and authority to make their own infant feeding decisions. Alternatively, the fact that a woman is in a monogamous marriage may indicate that she has a greater degree of personal authority, perhaps to the extent of influencing whether or not her husband takes a second wife.

B) *Recommendation concerning avoiding foods and other fluids*

1) *Positive association with education prior to delivery*

Prior to delivery, there appears to be a positive association between women's level of education, and the choice to try out the second recommendation regarding not giving foods and fluids. 9 out of 10 (90%) of the women who had a primary school level of education or higher chose to try out the second recommendation, compared to 4 out of 7 (57%) of those who had never gone to school. However, following delivery, there is no association between the level of education, and avoiding substances other than breastmilk.

Traumatic experiences encountered by four of the mothers in the sample during and after delivery.

Following delivery, four of the 26 women with whom the postpartum interview was conducted described the extreme and unusual difficulties they and their newborns had encountered during and after childbirth. Because of these distressing circumstances—which were often related to traumatic birth and postnatal experiences—the mothers were unable to follow the recommendations we had provided. For these four women, the decision not to follow any of the recommendations we had provided was not a choice, but was virtually the inevitable outcome of extreme circumstances. The women's distressing circumstances are described in the vignettes 8.2 to 8.5 below. Of the four women, only the woman who experienced a still birth was not included in the analysis.

Vignette 8.2: The story of a 32 year-old woman who had experienced postpartum hemorrhage and whose baby was born healthy as recounted by the mother:

Mother: *I lost a lot of blood during delivery [which took place at the hospital], more than is usual, after I had given birth my health was not good, I was unconscious, I was feeling faint, I was losing a lot of blood, I could not even tell who was coming in to the room and who was going out, it is as if I was drunk, that is why I stayed for so many hours before I began breastfeeding.*

Vignette 8.3: The story of a 30 year-old woman who had experienced postpartum hemorrhage and whose baby was a still birth as recounted by the interviewer: These events took place on March the 14th, 2005. The baby's mother began bleeding during delivery at home. Her husband took her to a clinic near their home, but the clinic personnel were unable to do anything, so they sent her to the main hospital in the Southern district of Pemba. At the hospital, it was noted that there was no foetal movement, neither could the foetus' heart beat be detected. The mother was given IV fluids and blood transfusion. She delivered at around 3.30pm on the same day (spontaneous delivery, no c-section). But the baby was a still birth. As of March 20th, 2005 the mother was still at the hospital, she was not doing so well.

Vignette 8.4: The story of a 40-year old mother who experienced prolonged delivery as recounted by the mother

Mother: “*The baby was not able to breastfeed, he stayed in my waters a lot [prolonged labor], so he was tired by the time he was born [The baby was born at home]. He took a long time before he was born, I thought he would be born dead. That day, he did not breastfeed, he slept without breastfeeding.*”

Vignette 8.5: The story of an 18-year old mother whose baby was born with “problems” as recounted by this author:

This was a home birth. We discovered some missing information in the young woman’s last interview, which had been conducted two days postpartum. We therefore went back to her house to collect this missing information. However, upon our arrival, we were informed that the baby had died two weeks after delivery. The mother explained that the baby had been having problems feeding and that, whenever the baby ate, he threw up what he had eaten.

Discussion

Methodological approach

The results of this study reflect the methods of the exercise that we undertook and must be interpreted within that context. In our study the recommendations that were presented to the women were utilized as an ethnographic tool. The purpose was to provide a common stimulus or probe as a means of assessing women’s reactions to new infant feeding behaviors. This is in contrast to the standard TIPS protocol in which program managers are expected to be much more pro-active in negotiating behavioral changes with participants, primarily because the protocol is typically applied within the context of formative research for a program.

As described in chapter 4, the standard TIPS protocol was modified in the following ways: a) using rigorous text analysis to analyze the interview transcripts obtained from the tape-recordings; b) interviewing women before and after delivery, rather than conducting postpartum interviews only and; c) conducting the research in one site. While these modifications allowed the research to benefit from the advantages the TIPS protocol offers, and while they overcome the limitations of the standard protocol, they make the protocol used quite different from the standard TIPS. For these reasons, while the study reported here draws heavily from the TIPS methodology, together with the earlier, peri-urban study, it is more accurately described as an ethnographic research study aimed at generating a description of newborn care, with an emphasis on the socio-cultural context of feeding practices.

Although the study was not a TIPS trial, we made an effort to build in some of the features that help to support the interpretation of the results in relation to future interventions. In the study, we began by building a trusting relationship between mothers and the research team. This was achieved mainly in three ways.

- a) Firstly, the two interviewers who conducted the bulk of the interviews were members of the community in which the research was conducted, and they were employed as field workers after consulting community leaders. Presumably, this ensured that their socio-economic status was similar to that of the women they were interviewing. An added advantage was that, although the interviewers were relatively young (ages 23 and 25), they each had a child and they had both been married (although they were both divorced at the time of the interviews, which is not uncommon in Pemba).
- b) Secondly, because of concerns about her higher economic and social status in relation to the women we were interviewing, the nurse-midwife's role was mainly to help in supervising and in transcribing and translating interviews. While she was trained in interviewing techniques, just as the other two interviewers, she only helped out with conducting 4 of the interviews. For the rest, she "sat-in" during some of the interviews as I did, providing technical help for the person conducting the interview and, for example, gently reminding the interviewer to ask any questions which had been skipped. Because of the training that she had received, which emphasized the value we placed on the women's views and perspectives, in any interactions with the women, the nurse-midwife was respectful and considerate. Additionally, in part because of the long periods spent walking from one home to another which required comfortable shoes and clothing, and in part because I explicitly requested "dressing down" during field work, I hope that socio-economic differences (as indicated by clothing) were less visible.

c) Thirdly, the messages were designed for the local population and were presented in a fashion that was intended to be supportive and motivational. Thirdly, mothers were always approached in a warm, friendly, attentive and supportive manner. We made it clear that we placed equal value on their decisions to accept or reject the recommendations, and that we respected their knowledge and valued their opinions. We put an emphasis on giving mothers generous praise for their endeavors, regardless of the outcome. Being good listeners was essential.

Overall, I hope that the reassurance we provided mothers allowed them to freely express themselves. In contrast to interactions between health care providers and local Pemban women, which are often characterized by a condescending and sometimes harsh approach in speaking with local women, and which may in turn affect women's willingness to be open and responsive, I hope that the relationship between the research team and the mothers was a trusting and respectful one.

Research findings

The findings from the study unequivocally confirm the high value women in Pemba place on breastfeeding and breastmilk. Some of the specific features of their newborn feeding beliefs and practices fit well with biomedical knowledge and recommended practices, but others do not conform as well. On the positive side, women do not reject colostrum as a substance to feed babies, and are therefore oriented to early initiation of breastfeeding. Also, for the most part, they do not perceive breastfeeding as an activity that should be carried out on a rigid schedule and are therefore oriented to feeding on demand.

As could be anticipated, the two recommendations that are in accord with the current cultural environment were readily accepted. Almost all the women who did not indicate in the pre-delivery interview that they intended to initiate breastfeeding within 2 hours of birth or feed on demand agreed to try out these recommendations

and their experiences with these behaviors were positive.

The study results show that exclusive breastfeeding is not part of cultural expectation and practice, as both water and other foods and fluids are regarded as normal substances for newborns. Thus, specific recommendations aimed at eliminating these substances represent the introduction of new ideas into the cultural repertoire of newborn care. In the study, 15 of the 26 newborns received water. The average age (in days) for newborns who received water was 5.6 days, with a range of 3-10 days. 7 newborns received food and/or other fluids. The average age (in days) for newborns who received food and/or other fluids was 6 days, with a range of 4-10 days. The average age (in days) for newborns who were exclusively breastfed was 4 days, with a range of 2-7 days. Although the sample is small, this indicates that, as the newborn grows older, water, foods and other liquids may be introduced into his diet.

With the exception of the recommendation not to give the baby any water to drink, and with the exception of the women whose birth experiences were traumatic and abnormal, the majority of women who initially agreed to try out a new behavior succeeded in doing so after their babies were born. 70% of those who had chosen to breastfeed on demand; 79% of those who had chosen to initiate breastfeeding within two hours of delivery and; 95% of those who had chosen not to give the baby any foods or liquids apart from breastmilk and, overall, 42 percent of the newborns were exclusively breastfed, up from 1% who had intended to exclusively breastfeed.

In assessing the women's breastfeeding intentions, the influence of significant others in decisions regarding feeding the newborn had emerged as an issue. Specifically, mothers expected their spouses to participate in providing breastmilk substitutes once the baby was born. We did not specifically assess the influence of significant others in the post-partum interview. However, because mothers did not spontaneously provide this information the mother was responsible for many of the

feeding decisions that she made during the first four weeks. Perhaps this is due, in part, to the close proximity of the mother and the newborn during the early postpartum period. However, we have no reason to believe that mothers continue to make independent infant feeding decisions throughout infancy. In reality, during my two visits in Pemba, and during casual interactions with friends and acquaintances in Pemba, I observed family members playing an important role in feeding the infant: fathers brought eggs and biscuits for the infant to eat; older children gave water, tea and fruits that they had collected to their infant brothers and sisters; and grandmothers often took care of the infant during the mother's absence. This suggests that, as the infant grows older, infant feeding increasingly becomes an affair in which members of the family actively participate. The high rates of success in influencing behavior change have important implications for future interventions promoting improved breastfeeding practices. They suggest that, in Pemba, the barriers to behavior change with respect to the infant feeding recommendations do not occur at the stage of the *willingness* or the *ability to try* a new behavior and that it is only the rare situational constraints which may prevent a woman from carrying out her intention.

Conclusion

From a nutrition and public health perspective the results of this study are encouraging in several respects: (1) breastfeeding is well protected, (2) encouraging early initiation and on-demand feeding requires virtually no special intervention beyond providing women with information (at least within the context of home delivery), and (3) although exclusive breastfeeding is not normative, many women are willing to try avoiding the giving of water and other foods and fluids, and if they agree to try, they generally succeed. The fact that some of the women in the sample did not accept the recommendations that would result in exclusive breastfeeding should not be interpreted negatively with respect to the prospects of convincing women in Pemba to

try new behaviors that are not consonant with current cultural expectations.

We hope that, in future large-scale programmatic interventions in the island, program managers will pay attention to issues raised by the patterns observed in the data-set, including the influence of women's age, socio-economic status and autonomy in decision making. We also hope that future interventions will be alert to the difference in responses to advice regarding "water" and to advice regarding "breastmilk substitutes."

Within a given culture, breastfeeding practices reflect the ways in which women negotiate and incorporate cultural norms within the realities of their personal circumstances and social support systems. This study, in a low-income sub-Saharan Africa setting investigated norms of breastfeeding and the potential for improving them in relation to current public health guidelines. To that aim, behavioral changes that were potentially feasible and culturally acceptable were identified. The methodology provided an opportunity to observe women's responses to infant feeding recommendations under circumstances that did not put pressure on them from external authority. The study provides insight into the ways in which women conceptualized breastfeeding prior to birthing, and their experiences with these recommendations. The results demonstrate that the majority of women who decide to modify their practices are able to do so. They also suggest that finding ways to support women to make decisions that will have a positive impact on their newborns' health is a priority for future work.

CHAPTER 9

IMPLICATIONS OF THE THREE CASE STUDIES FOR INTERVENTIONS TO IMPROVE EARLY INFANT FEEDING

While it is now recognized that, during the first six months of life, exclusive breastfeeding plays a crucial role in promoting infant health and survival, in many countries around the world, mixed feeding is the norm, but exclusive breastfeeding is not. In this dissertation, I have presented a series of descriptive studies investigating early infant feeding beliefs and practices in sub-Saharan Africa. By focusing on feeding from an emic (or insider) perspective, the relationship of current beliefs and practices to the biomedical ideal of exclusive breastfeeding can be examined and the results used to inform the design of programs, including the structure and content of communication activities that improve program effectiveness.

In the first part of this chapter, I begin by a) noting some general commonalities and differences across the sites in which the research was conducted, b) comparing the samples of women to the populations they were drawn from and highlighting the implications of sample selection for generalizing to other populations, and c) discussing the strengths and weaknesses of the methodological approaches used.

Because all of the studies were guided by the socio-ecological model presented in Chapter 2, in the second part of the chapter, I review the findings in relation to this general theoretical framework. I conclude the chapter with a discussion of the implications of the study results for the design of programs to improve infant feeding behavior in sub-Saharan Africa.

Comparisons of the site and the samples

Site characteristics: Social, political and economic commonalities and differences

South Africa, the country in which the first case study is situated, is one of the richest countries on the African continent and, worldwide, it is one of the few African countries to have joined the group of upper middle income countries (World Bank, 2005). However, almost ten years after the dismantling of apartheid, there are still significant wealth differentials between the white and the non-white populations within the country. While the income for white South Africans approaches that of developed countries, many of the non-whites have similar incomes to other low-income African countries. The World Bank (2005) estimates that thirteen percent of the population (mostly white) lives in “first world” conditions, while at the other extreme, about 22 million people (mostly non-white) live in “third world” conditions. According to the World Bank, in this latter group, only one-quarter of households have access to electricity and running water; only half have a primary school education; and over a third of the children suffer from chronic malnutrition.

In contrast, Tanzania, which is the country site for 2 of the case studies, is one of the poorest countries in sub-Saharan Africa, and in the world. The World Bank (2005) estimates that, in Tanzania, per capita income is about US\$ 330, which is roughly a third of per capita income for non-whites in South Africa. Life can be a struggle for most people in Tanzania: there are high rates of unemployment and many people lack decent housing, access to clean water, sanitation and electricity.

Also of importance as a defining, comparative characteristic is the high prevalence of HIV in South Africa. According to UNAIDS (2005), over 20% of South Africans are infected with HIV and, by the end of 2003, an estimated 5.3 million South Africans were infected—the largest number of individuals living with the virus

in a single country worldwide. Hlabisa, the specific site for the first case study, where an estimated 40% of pregnant women attending pre-natal clinic are HIV infected, is no exception (Africa Center for Health and Population Studies, 2001). In contrast, about 8% of Tanzanians are infected with HIV and, for in the specific study sites in the Zanzibar islands, the prevalence is even lower: at the last estimate, the HIV prevalence in the general population in Unguja and Pemba is at 0.6% (UNAIDS, 2004).

Tanzania, however, has one of the world's highest rates of infant mortality: an estimated 43 out of every 1000 babies die within the first 28 days of life (Lawn et al., 2005). The rate of newborn mortality in South Africa is lower, and is estimated to range from 5-17 deaths out of 1000 live births (Pattison et al., 2005).

Finally, of note is the difference in religion. The vast majority of South Africans (80%) are Christian, popular denominations include: "Zion Christian"; "Apostolic"; "Pentecostal-Charismatic"; Catholic; Methodist and; "Dutch Reformed" (Anderson, 2005). Only 1.5% of the South African population is Muslim (CIA, 2003). Almost all of the Zion Christian, Apostolic and Pentecostal churches in South Africa emphasize the power of the "Holy Spirit" in the church, and in most churches, healing, prophecy, exorcism and speaking in tongues are common features (Anderson, 2005). In contrast to the Christian majority in South Africa, over 99% of Zanzibaris are Muslim (CIA, 2001). This also contrasts to mainland Tanzania where about one third of the population is Christian, about one third Muslim, and the remaining one third practice "traditional" religions (CIA, 2001).

Characteristics of women in the three samples and their implications for generalizing the results

All samples are small and, in the case of the Hlabisa and Chasasa study, conveniently selected. Of note are the particular characteristics of the Hlabisa sample, which may be strikingly different from the larger population of the region from which the sample

was drawn. To be included in the study, women had to go through several selection steps, with the possibility of elimination at each step. The larger study in which my study was embedded was designed to test a specific hypothesis about exclusive breastfeeding and HIV status, and the selection criteria imposed by that feature required the following, sequential steps: a) agree to be tested for HIV, b) come back to a clinic for the results, and c) be invited to participate in the study if found to be HIV positive, d) agree to participate in the larger study, and e) agree to participate in my study. The reality in Hlabisa, as in many other parts of sub-Saharan Africa, is that many women chose not to test for HIV and, even if they were tested, they chose not to know their status. Added to this is the social stigma of participating in a study that clearly became identified as an “HIV study” in spite of the investigators efforts to present it to the community as an infant health and wellbeing study. For this reason, it is highly unlikely that women who participated in the study were representative of the general Hlabisa population of women.

In peri-urban Pemba, one of the criteria for eligibility for recruiting women into the sample was literacy. This criterion was imposed in order to facilitate the pile sorting exercise. Technically this ethnographic tool can also be used with a non-literate population, but the concepts that were involved were sufficiently abstract that it seemed best to limit the sample to women who were comfortable working with written materials. Consequently, the peri-urban sample may not be representative of the general population of Chasasa, or even of Pemba. Almost all of the women in the sample had a secondary school education. In contrast, in Tanzania, for every 100 pupils who complete primary school, only 20 enroll in Secondary School (UNESCO Global Education Digest, 2005). Of these, roughly 10 are women, and many of them never complete their secondary education (Kravdal, 2001). For this reason, in

Tanzania, women with a secondary school education constitute a minority (Kravdal, 2001). This raises a caution about generalizing the results to non-educated women.

However, it is encouraging to note that the results of the Multi-Dimensional Scaling presented in chapter 7 indicated striking similarities in perspective between the literate peri-urban woman and the literate women in the rural sample. The latter are, on average less well educated than their peri-urban counterparts, although more literate than non-literate women. The fact that the peri-urban and rural women had such similar conceptual maps suggests that the results of the exercise reflect deeply engrained cultural models rather than recent cultural interpretations, and is encouraging in terms of extending the results more widely and in terms of planning future interventions related to feeding the newborn in Pemba. In relation to interventions in particular, the finding suggests that the subtle differences noted in the thematic analysis may not warrant replicating the study, and that “checking” the results in new sites prior to designing interventions may be adequate.

Because we interviewed the “universe” of pregnant women in the rural village, the sample from rural Pemba may be more representative of the village from which the women were drawn. These women were recruited as follows: a) with the help of a nurse, we first consulted a list of all pregnant women who had visited the main hospital in the community (referred to as a “cottage” hospital); b) we then visited the women’s homes to find out if they were in their last weeks of pregnancy and if they intended to stay in the community for postpartum seclusion and; c) to complement the hospital list, we also asked women to refer us to any of their pregnant friends and relatives who lived close by. Through this process, we identified a total of 30 eligible women. Of these, 83% were referred by the hospital nurse, while 17% were community-based referrals. This implies that the results of the third study may be generalizable to the community of Vitongoji and could find resonance in similar

settings in Pemba. However, given the rather unique history of Pemba, which its strong Arabic influences, we do not know how similar the cultural patterns we describe in case studies two and three can be generalized to the mainland of Tanzania.

Methodological approaches

All three studies utilized a focused ethnographic approach to investigate infant feeding behavior. In keeping with ethnographic science, they attempted to detect the extent to which there were commonly shared beliefs and perceptions within each study site, while indicating variability when this occurred. In addition to describing women's infant feeding behavior, the ethnographies sought to provide an in-depth understanding of why women were doing what they were doing. Also in keeping with ethnographic traditions, in all three studies, there was an attempt to understand respondents' behavior and their beliefs from the point of view the respondents themselves, rather than from the researcher's own etic (or outsider) perspective. As a consequence, we attempted to create an environment in which the mothers we interviewed knew that we respected their knowledge and valued their opinions. We hope this open, non-judgmental attitude encouraged them to be fully expressive. This approach, coupled with interview techniques that avoid the danger of predetermined categories of answers increases the likelihood that the respondents were telling the truth as they saw it.

Since multiple ethnographic methods were used to collect information (a practice also referred to as "triangulation"), the results created a rich, detailed description of the culture of infant feeding behavior within each setting. However, as with all case study research, generalizing must be approached more cautiously. Also, as with other case-study research, the conclusions can only be definitively applied to the participants who were interviewed.

On the other hand, culturally-based description should be generally applicable to other sites where there are general social and cultural similarities (Lauer and Asher, 1988). For example, the results obtained from Pemba may be applicable to rural Unguja and to other Swahili communities along the East Coast of Africa, while the results obtained from Hlabisha may find resonance in other rural areas of Kwa-Zulu Natal. The results can also be used to suggest further questions, hypotheses, and future implications (Lauer and Asher, 1988).

One of the limitations of using the ethnographic approach was that, especially in the exploratory phases, we frequently revised interview guidelines as new factors identified in early interviews were followed up in later interviews. As a consequence of this iterative and flexible approach, in which new questions were asked throughout the course of data collection, the same information is not available for every individual who was interviewed. This presented some challenges for quantifying the ethnographic data obtained (Bentley et al., 1999). The problem was particularly acute during the exploratory phases, in the interviews with nurses and counselors in Hlabisa, and with TBAs and traditional healers in Pemba (data is not presented in the dissertation).

Another limitation of the three studies was the use of “focused” versus “full blown” ethnography. While this “rapid” approach is less costly and less time consuming than traditional, holistic participant-observation, inevitably there is much less contextual information, a generic problem with this type of research that has been discussed in the theoretical literature in applied anthropology (cf Manderson, 1998). Without this extensive local context data it becomes necessary to rely on other published and unpublished sources for background information, including the description of the social and historical features of the study sites.

Analysis of the findings in relation to the socio-ecological model

In descriptive research, in anthropology and other social sciences the identification of the sectors of information for which data are collected is often established in relation to a theoretical model or framework. In my case studies I drew from an ecological framework to understand infant feeding behavior in relation to the broader social, economic and political context in which the behavior occurs. As noted in chapter 2 of the dissertation, the ecological framework recognizes the importance of cultural, environmental, and social systems on human behavior. Although ecological models vary in some respects (e.g. in terminology and areas of emphasis), they all make the point that in order to fully understand human behavior, one must understand the context in which that behavior occurs (Pelto and Pelto, 1975, Bronfenbrenner, 1979; McElroy et al., 1988).

A primary purpose of a theoretical model, such as the ecological model presented in chapter 2 is to facilitate the organization of research. Such models are particularly useful in organizing factors associated with complex social problems, in part because they allow better conceptualization and knowledge-building, while directing attention to the factors that are likely to be important for interventions (see for example: Bentley et al., 1999; Eaton et al., 2002).

In the following section, I examine each of the three studies presented in this dissertation in relation to the specific factors that influenced infant feeding behavior at the following levels: 1) the individual; 2) interpersonal relations; 3) settings in which the individual operates and; 4) the legal, political, economic or organizational elements of society.

1. Individual level

Cognitions, beliefs, feelings

The South Africa study highlights women's beliefs about HIV transmission and about breastfeeding and infant formula and provides insights into how these affected the women's choices. Some of the women believed that a baby is infected before birth and, for this reason, they may have had difficulty understanding Mother-To-Child Transmission of the disease through breastmilk. For those who accepted the idea that the disease could be transmitted postpartum, they often saw themselves as having to choose between benefits of breastmilk, on the other hand, and their fear of giving the virus to their babies.

The women from Tanzania believed that breastfeeding is the "natural" way of feeding an infant. However, their belief that mother's breastmilk was often insufficient to sustain their newborn may have been incentive for the addition of breastmilk substitutes. Moreover, the absence of a belief that breastmilk could meet an infant's fluid needs, coupled with the belief that "human beings cannot live without water" makes it particularly difficult for mothers to exclusively breastfeed, even after they have received education. Clearly, there is a need to continue providing health education, and to attempt to change mothers' beliefs about the insufficiency of their breastmilk and its capacity to meet fluid requirements.

Mother's health status

In the South Africa study, although the mothers we interviewed were apparently healthy, despite their HIV status, many of them were afraid of transmitting the virus to their babies, and this affected the decisions they made. This is a dramatic example of the importance of a factor that is probably operative in other places – namely, women's assessment of their own health status and their postpartum health condition. In Tanzania, as illustrated in the third study, mothers who went through traumatic

experiences during and shortly after delivery were unable to feed their newborn as they had intended to. This highlights the importance of holistic approaches, in which, in order to improve infant feeding, mothers' health must be promoted in the first place.

Other maternal characteristics and their implications for maternal self efficacy

In the South Africa study, we noted the importance of the mother's age in influencing her infant feeding decisions; younger mothers were less likely to choose infant formula compared to older mothers. Perhaps these younger mothers lacked the necessary resources for formula feeding, and/or lacked autonomy in their infant feeding decisions. In Tanzania, the mother's age was also observed to be an important influence. In Tanzania, the influence of maternal age was not as strong as in South Africa.

The association between younger age and difficulty with breastfeeding may be explained by the concept of "self efficacy." Perhaps, because younger mothers have had little or no experience with breastfeeding, they may lack confidence in their ability to breastfeed, perceive their breastmilk to be insufficient milk, and readily accept suggestions to supplement their breastmilk.

2. Interpersonal level

Maternal responses to infant's cues

Although the South African mothers described themselves as exclusive "formula feeders" or "breastfeeders," in reality, they adjusted their infant feeding behaviors in response to their infant's cues, with phrases such as "he refused it [breastfeeding]" or "he didn't like it [infant formula]." In Tanzania, mothers also responded to the infant's cues, and justified giving the newborn breastmilk substitutes with phrases such as "the baby is hungry" or "the baby is crying a lot" or "my milk is not enough." This confirms observations in other settings that mothers make feeding decisions in

response to their infants' perceived needs, health and behavior (see for example: Piwoz, 1994).

Maternal responses to advice from family, relatives, traditional birth attendants and health care providers

In the South Africa study, the importance of family influences was apparent in the differences between younger and older respondents. Younger mothers reported receiving advice from family members, particularly in relation to exclusive breastfeeding and to the need to supplement the infant's diet. As various authors have argued, younger mothers are particularly susceptible to prescriptive advice from older women, such as the infant's grandmother (Bentley et al., 1999; Aubel et al., 2004).

Prior to delivery, and prior to receiving information to promote exclusive breastfeeding, Tanzanian mothers anticipated that the baby's father would provide breastmilk substitutes such as cow's milk, porridge and biscuits. A minority of the women mentioned the grandmother or "whoever was near the baby." Because the number of newborns who received substitutes was too small, we were unable to assess the extent to which fathers provided breastmilk substitutes following delivery. However, the finding that mothers of higher socio-economic status had difficulty avoiding breastmilk substitutes and women's anticipation that the father would provide these substitutes, indicates the importance of educating fathers about infant feeding, particularly in relation to breastmilk substitutes. Perhaps, as suggested by Krumeich et al. (2001) fathers may provide breastmilk substitutes as a demonstration of their "love" for the mother and/or the baby. Perhaps too that, when fathers have higher socio-economic status, they may be expected to provide even more. In contrast, mothers themselves need to be educated about water, as they anticipated giving this to their newborns themselves.

3. Settings in which the individual operates

Health care settings

While the Baby Friendly Hospital movement, established in 1992, has had a positive influence on breastfeeding (WHO, 1998), it can create a problem for women who deliver in Baby Friendly Hospitals and choose not to breastfeed. In the South Africa study, the dilemma of disclosing one's HIV status in relation to one's choice of infant feeding was immediate at the time of delivery. Reflecting the communities in which they are located in which, as in many other communities in sub-Saharan Africa, breastfeeding is a strong cultural norm, hospitals in Kwa-Zulu Natal South Africa encourage women to breastfeed. For this reason, in the Kwa-Zulu Natal study, not breastfeeding in hospital was tantamount to disclosing one's status as HIV positive. Some women who intended to formula feed their infants ended up breastfeeding while they were in the hospital in order to avoid signaling their HIV status to others.

In Tanzania, only a minority of women give birth at the hospital and, unless there are complications during delivery, these women stay in hospital for less than 24 hours. For this reason, the possibility of affecting women's infant feeding decisions in the hospital is limited. In the Tanzania study, mothers reported negative encounters with health personnel and mentioned the high cost of formal health care. This suggests that, for hospital based initiatives to be well received in this setting, there needs to be significant investments to improve the delivery of health services.

In the Tanzania study, most of the mothers (83%) were recruited from the primary health care unit (PHCU), and were referred to us by the nurse. The nurse suggested obtaining informed consent from the women when they came to the PHCU for routine pre-natal care. During the recruitment process, we noted that, following individual sessions of pre-natal care which took place at the PHCU twice a week, women often stayed on for a free health education class offered by a PHCU staff

member. Topics included, for example, the possibility of water sources being contaminated, and the need to boil water before drinking it. Perhaps, in a future study, in addition to meeting with women individually in their homes, formal health care providers could be involved in delivering breastfeeding messages. Elsewhere, breastfeeding promotion activities utilizing formal health care providers have been shown to be successful (see for example Haque et al., 2002).

When asked what they recommended as appropriate venues for the provision of information, 75% of the mothers noted that having information provided to them in their homes was a good option; 6% mentioned the hospital, and 19% had no opinion. A venue that the women did not mention, but which we think might also be effective is the village meeting place. At the start of the study, the village chief had offered to summon all eligible women to the village meeting place and to have us interview them there. Because we wanted to approach women one-on-one, and in a warm and friendly manner, we declined this offer. But perhaps, in a future large-scale project designed to promote exclusive breastfeeding within this community, bringing the village chief on board and obtaining his political endorsement would be an added advantage.

The home setting

When large, extended families live together, the possibility of interference with the mother's infant feeding practices is real, both in developed nations (see for example: Bentley et al., 1999) and in developing nations (see for example: Deang et al., 1988; Espinoza, 2002). Sometimes, extended families may provide support for the mother, allowing her to breastfeed her infant (see for example: Espinoza, 2002) while, at other times, family members may encourage the mother to introduce other foods and liquids to the infant's diet in response to infant crying or failure to gain weight (see for example: Bentley et al., 1999). In South Africa, the latter situation seems to have been

more common, particularly among younger mothers. This highlights the need for community based approach to target both mothers and their family members, particularly older female members of the family, and the baby's father. Because we had fewer adolescent mothers in the Tanzania study, we were unable to assess the importance of the practice of postpartum seclusion.

In these sub-Saharan Africa settings, women who are in their later reproductive ages may play multiple roles within the community. They may be mothers of newborn babies, grandmothers and/or TBAs. For example, a woman aged 40 years old could have a newborn, and an older daughter who is a new mother. In such a situation, the 40 year old woman plays the role of a mother (to her daughter and her own newborn) and a grandmother (to her daughter's new baby). Because young new mothers are likely to be secluded in their mother's homes, they may be heavily influenced by observing and by obtaining advice from their own mothers.

We also note that, in the sample of women interviewed for the third study in the dissertation, 59% of the mothers delivered at home, and about one half of these mentioned the help of TBA—often an older woman who is highly respected in the village. This highlights the importance of TBAs within the community and emphasizes the need to provide information to older and younger women in the community.

Formal employment settings

In contrast to rural South Africa, there are relatively few opportunities for formal employment in rural Tanzania for both men and women. In Pemba, farming is often for subsistence and this may allow mothers more flexibility with their schedule. Pemban mothers who have older female children often delegate responsibilities to them. This may be why formal employment was not cited as an issue in our sample.

In South Africa, in general, women have fewer children than in Tanzania. On average, South African women have 2.4 children over the course of their reproductive health, while Tanzanian women have about 5 (CIA, 2003). Also, in South Africa many women have opportunities to participate in the formal economic sector. In Hlabisa, cash crop farming is common and formal employment was an issue in women's decision making. Mothers' first preference for delegating infant care responsibilities is to other relatives and, if this is not possible, to employ a "nanny." However, as observed by Marshall (1983), delegating infant care responsibilities often has negative consequences for the health of the infant and, if commercial breastmilk substitutes are used, it incurs considerable expenses.

Many of the women in our South African study had chosen not to participate in paid, formal employment away from home, perhaps because they recognized that the workplace would not support continued breastfeeding. This suggests that it is unreasonable to promote breastfeeding in communities without also guaranteeing working women an adequate opportunity to do so. Perhaps, as Marshall (1983) suggested based on her experience in Papua New Guinea, a low income developing country, for women who work, the constraints of continuing to breastfeed while employed may be "loosened" when mothers are allowed to take breaks during the working day to express breastmilk and/or to breastfeed their infants. Alternatively, allowing mothers to work part-time may encourage mothers to continue breastfeeding.

4) Legal, political, economic and religious aspects of society

In both sites, as in many other settings in sub-Saharan Africa, breastfeeding is a strong cultural norm, and many children are breastfed well into their second year of life. However, breastfeeding is not practiced exclusively, and infants are often supplemented with breastmilk substitutes such as tea, animal milk and infant formula.

In South Africa, the ready availability of infant formula and of other commercial infant foods such as “cerelac” may play an important role in encouraging the introduction of breastmilk substitutes into the infant’s diet. This reinforces the continued need to monitor adherence to the International Code of Marketing Breastmilk Substitutes and, where necessary, to actively enforce the code. In Tanzania, the relatively limited access to commercially manufactured food items may explain why some mothers in the sample may not even have seen infant formula. However, mothers used other breastmilk substitutes, which are readily available to them, such as tea, cow’s milk and even biscuits. This highlights the need to tailor infant feeding messages about breastmilk substitutes to the local economic context.

Finally, we want to highlight the utility of the ecological framework in drawing attention to the need for a “holistic” approach to understanding infant feeding behavior. The studies presented in this dissertation highlight the influence of socio-cultural factors on infant feeding behavior and reveal the constraints and motivations for women to practice appropriate infant behaviors. The stories and experiences of the women interviewed also attest to the personal and social complexity of their lives.

As the first and the third studies illustrate, it is necessary, but not sufficient, to provide health education and to only address only the cognitive structure underlying infant feeding behavior. As Donahue and McGuire (1994) have argued, it is difficult to imagine that individualized approaches can be adequate to address such complexity. It is equally difficult to focus on individual behavior change without lapsing into “blame the victim ideologies” which help “protect, maintain and reproduce existing inequalities.” Various authors have observed that, while they may not fail entirely, ultimately, individual behavioral interventions do not succeed without broad social change and that, to better address the complexities of people’s lives, a two-pronged

effort which tackles both the “micro” and the “macro” is required (see for example: Donahue and McGuire, 1994; Finerman R and Bennett, 1995).

Lessons learned and applications to improve infant feeding practices

As MacQueen and Cates (2005) propose, basic biomedical research and epidemiologic studies often help to advance scientific knowledge and to find out ways in which disease can be prevented. However, translating research into practice for “end-users” requires much more than providing “biomedical knowledge” to the end-user. For example, in the matter of HIV and infant feeding, the finding that HIV can be transmitted through breastmilk led to the design of epidemiologic studies to prevent transmission of the virus through breastfeeding. However, as the first study illustrates, this information is difficult to translate to the “end user” (in this case mothers of young infants), particularly because the “end user” has an explanatory model that differs from the biomedical framework.

MacQueen and Cates (2005) also note that “advocacy” is required to generate funding and institutional support for translating the research to practice. The authors observe the importance of raising community awareness to the potential role of the research in addressing their health priorities, this awareness is not necessarily passive—ideally, it should include the active involvement of community members in setting their own priorities based on their health needs. The authors propose that, if an intervention is to be conducted in a community, qualitative research should be used to generate data designed to address questions of acceptability and to enhance the translation of results to programs if effectiveness is established.

In Table 9.1 below, I propose ways of “translating” current biomedical knowledge about infant feeding for the end user. For example, one recommendation is based on the observation that the Swahili culture is one in which the spoken, oral word is highly valued. In Pemba oral conversation is an important feature of

communication. People generally like to converse, and it is not uncommon to see people sitting around fires during the night and chatting. Few people own a television set. Men often sit in groups, listen to a radio together, and follow up with a lively discussion of the issues raised on radio. Because few can read and write, newspapers are not often used as a source of information.

There is a discrepancy between the way in which health information is routinely provided and the features of this setting. For example, in the main hospital in Wete (which is close to where the second study in this dissertation was conducted), we noticed that much of the information on breastfeeding is in written (poster) form. But because most mothers are illiterate, we suspect that the information fails to reach the majority. For this reason, as long as levels of education remain low, the use of visuals and oral modes of communication would be more suitable. In this regard, the PHCU (where women were recruited for the third study) seems to do a better job at communicating with the women: in addition to health information provided in written (poster) form, health classes in which information is provided orally, and for free, are made available to the women twice every week.

I summarize lessons learned from the three studies in the tables that follow and discuss how these may be applied in interventions designed to improve infant feeding behavior in the early postpartum period in similar settings in sub-Saharan Africa.

Table 9.1 Lessons learned and applications from the three studies in relation to Infant feeding in the context of HIV

Research finding	Relevant policy	Applications for programs and interventions
Social stigma of HIV infection makes women afraid of replacement feeding, particularly in environments such as these where breastfeeding is a strong cultural norm	BFHI, mother's rights to their own choice of a method of infant feeding	<ul style="list-style-type: none"> • Stigma and fear should be addressed in hospitals and in the community by reinforcing positive messages and by initiating community dialogue • Train health workers and members of the community to respect mother's rights to choice of infant feeding
<ul style="list-style-type: none"> • Role of economic circumstances in determining decisions about infant formula • Beliefs about breastmilk and infant formula 	Counseling HIV infected women should include information about risks and benefits of replacement feeding	Tailor counseling to address mother's specific economic situation and her beliefs about infant feeding options
Belief that all babies of HIV positive mothers born infected	Provide mothers with full information to allow them to assess risks	Design simple messages which allow mothers to assess risks of transmission through various routes

Table 9.2 Lessons learned and applications from the three studies in relation to essential newborn care

Research finding	Relevant WHO guideline for newborn care	Applications for programs and interventions
Poor encounters between hospital personnel and mothers	Hygiene during delivery	<ul style="list-style-type: none"> • Invest in training hospital personnel to improve their client service skills • Improve health care facilities (example, increase the number of beds so that mothers do not have to sleep on the floor)
Ritual pollution and bathing newborns on same day	Prevent hypothermia	Educate women and their families with messages and recommendations that do not directly attack existing beliefs, but prevent the continuation of negative behaviors
Traditional treatments, lack of vaccination, postpartum seclusion isolates mother and newborn	Prevent and manage illness	Emphasize the importance of seeking help when the newborn is ill, even during postpartum seclusion
Beliefs about baby being “thirsty”	Early and exclusive breastfeeding	Continued promotion of exclusive breastfeeding
Massage and application of topical oils	Not yet addressed in policy settings	Further research needed
Feeding identified as distinct from other aspects of care-giving, ambiguity about discreetness of other groupings	Should breastfeeding promotion activities be integrated into holistic programs related to newborn care, or should programs specifically target breastfeeding?	Feeding-specific interventions may fit well with the local cultural understanding, a program may not have to simultaneously address all aspects of newborn care

Table 9.3 Lessons learned and applications from the three studies in relation to Infant feeding in general

Breastfeeding messages are produced in written form. Few women in sub-Saharan Africa are literate	Breastfeeding messages should use images, words and stories that are relevant to the audience they are targeting
Women are expected to make independent decisions about infant feeding	Strategies for involving family (including the mother, the mother-in-law and the partner) should be developed and implemented

The results of these three studies provide a cultural description of breastfeeding behavior during the first six months of life. The three case studies all shed light on the socio-cultural factors that influence, facilitate or constrain exclusive breastfeeding in the three communities in which they were conducted. The results obtained from the rural Pemba community offer guidance for designing counseling and education messages for improving infant feeding. The strategy used to guide behavior towards exclusive breastfeeding was to expose women to a set of individual, specific behaviors, each of which contribute to the practice of exclusive breastfeeding. Rather than giving a single broad message to "exclusively breastfeed," we examined current behaviors in relation to the requirements for exclusive breastfeeding, which include early initiation and feeding on demand (positive behaviors) and avoiding water and foods and other fluids (negative behaviors). We then developed a message for each of these individual behaviors and examined women's responses to each one. This permitted us to identify the specific behavioral barriers and to learn which ones are more readily accepted. This approach, which is based on understanding feeding behaviors and their rationale from the perspective of families, and designing messages to achieve ideal behavior in relation to current practices, may serve the broader goal of informing future large scale programs and interventions designed to promote exclusive breastfeeding. This is an essential first step to the design of effective programs to improve feeding practices and, in the long term, reduce deaths in early infancy.