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Understanding home-based neonatal care practice in rural southern Tanzania

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Summary In order to understand home-based neonatal care practices in rural Tanzania, with the aim of providing a basis for the development of strategies for improving neonatal survival, we conducted a qualitative study in southern Tanzania. In-depth interviews, focus group discussions and case studies were used through a network of female community-based informants in eight villages of Lindi Rural and Tandahimba districts. Data collection took place between March 2005 and April 2007. The results show that although women and families do make efforts to prepare for childbirth, most home births are assisted by unskilled attendants, which contributes to a lack of immediate appropriate care for both mother and baby. The umbilical cord is thought to make the baby vulnerable to witchcraft and great care is taken to shield both mother and baby from bad spirits until the cord stump falls off. Some neonates are denied colostrum, which is perceived as dirty. Behaviour-change communication efforts are needed to improve early newborn care practices.

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1. Introduction

It is unlikely that the fourth Millennium Development Goal (MDG 4: reduce child mortality) will be achieved without substantial reductions in neonatal mortality (Lawn et

al., 2005). About 4.0 million of the annual 10.8 million global deaths in children younger than 5 years occur in the first month of life (Black et al., 2003; Lawn et al., 2004). Worldwide, the average neonatal mortality is estimated to be 33 per 1000 live births (Zupan and Ahman, 2005). Nearly all neonatal deaths (99%) occur in low and middle income countries and about half occur at home (Black and Kelley, 1999; Lawn et al., 2004). Three quarters of neonatal deaths occur in the first week of life, suggesting the need for early care (Darmstadt et al., 2007).

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Although there is substantial geographical variation, the neonatal mortality for Tanzania is 32 per 1000 live births (NBS [Tanzania] and ORC Macro, 2005). Based on data from the Demographic and Health Survey (DHS) 2004/5, between 2000 and 2004 Tanzania reported a dramatic reduction in mortality in infants and children under 5 years of age, with overall under five mortality dropping from 147 to 112 per 1000 live births and infant mortality dropping from 99 to 68 per 1000 live births. However, the reduction in the neonatal mortality rate was much smaller and not statistically significant, from 40 to 32 per 1000 live births (NBS [Tanzania] and Macro International Inc., 1997; NBS [Tanzania] and ORC Macro, 2005)

Birth and emergency preparedness is a key component of globally accepted safe motherhood programmes (Moore, 2000) and is widely promoted by international agencies (WHO, 2003). Globally, about half of all births take place without skilled care; in the poorest quintile of many developing countries about 90% of mothers deliver babies at home without a skilled health professional present (Gwatkin et al., 2004). The first-line providers at birth are usually relatives or traditional birth attendants (TBAs) and the mother's confinement at home is often dictated by a combination of poverty and societal and cultural factors (Martines et al., 2005). An increasing body of evidence suggests the importance of reaching these poor families through a combination of approaches (Knippenberg et al., 2005).

Behaviour at household level has been one of the main targets for research programmes aimed at improving neonatal mortality (Bang et al., 1999; Bhuta et al., 2005; Darmstadt et al., 2006). In their model, Marsh (2002) identified a set of behaviours at household and community level that, if implemented well, would generally improve neonatal mortality: improved routine maternal and newborn care, including the use of antenatal care services; early seeking of care for maternal and newborn danger signs; rapid and appropriate response to non-breathing newborns and improved care for low birth weight babies.

Interventions designed to change neonatal care practices must take into account practices or actions that are locally believed to be beneficial or risky (Parlato et al., 2004). There is evidence that over the last two-to-three decades behaviour-change communication approaches have contributed to substantial improvements in the health status of the newborn in the developing world (Seidel, 2005). Many significant gains were made in the 1980s and 1990s in home use of oral rehydration therapy; completion of childhood immunisations; breastfeeding and other nutrition-related practices; timely care-seeking for acute respiratory infections and malaria; and various home hygiene and sanitation measures (Seidel, 2005). In rural India, a programme was implemented to encourage evidence-based essential newborn care including skin-to-skin care (skin contact in order to improve the bonding between mother and infant); birth preparedness; immediate and exclusive breastfeeding; and hygienic skin and cord care. Community-based workers used interpersonal communication to deliver these messages to pregnant women, their families and influential community members. This intervention was well accepted and was perceived to prevent newborn hypothermia, improve the mother's capability to protect her baby from evil spir-

its and make the baby more relaxed (Darmstadt et al., 2006).

Successful key behaviour change entails a thorough understanding of the target community members and the key factors influencing the behaviours in question. Qualitative research provides vital information about what could motivate this audience to improve its newborn care practices at household and community level (Parlato et al., 2004).

In order to understand childbirth and neonatal care practices which can provide a basis for development of strategies for improving neonatal survival in rural Tanzania, we conducted a qualitative study at the household and community levels with a focus on preparation for childbirth and newborn care practices.

2. Methods

2.1. Study area

The study was conducted in Lindi Rural and Tandahimba districts in Lindi and Mtwara regions, which have a total population of about 300 000 people (NBS [Tanzania], 2004). The study area is well described elsewhere (Mrisho et al., 2007). In brief, the area has a wide mix of ethnic groups, the most common being Yao, Makonde, Mwera and Matumbi. Most people use the vernacular language in daily life but Swahili is also widely spoken. The majority of people are poor rural subsistence farmers. The public health system comprises dispensaries in the periphery, health centres and hospitals, offering varying levels of care, and over 90% government owned.

Lindi and Mtwara regions are reported to have the highest neonatal and infant mortality rates in the country (NBS [Tanzania] and ORC Macro, 2005). More than half (58%) of births are at home (Mrisho et al., 2007). Trained and untrained TBAs assist 16% and 40% of births in Lindi and Mtwara, respectively. Relatives or other unskilled attendants assist 35% and 20% of births in Lindi and Mtwara. Two percent of babies are delivered without assistance (NBS [Tanzania] and ORC Macro, 2005).

2.2. Field methods

The study was carried out in Lindi Rural and Tandahimba districts within the framework of a community effectiveness study of intermittent preventive treatment for malaria in infants (IPTi) (IPTi Consortium, 2008). The eight study villages were deliberately selected to represent areas with specific characteristics, including close proximity to a divisional boundary, varied vaccine coverage levels and close proximity to a main road and to the border with Mozambique. Data collection took place between March 2005 and April 2007.

A total of 40 in-depth interviews and 16 focus group discussions (FGD) were conducted (Dawson et al., 1993). Five in-depth interviews on key topics were done in each village: two in-depth interviews with women who had recently delivered at home or in a health facility, two in-depth interviews with pregnant women and one in-depth interview with a TBA. Two FGDs were conducted in each village and

brought together 6–8 women who had given birth at least once and had similar backgrounds and experiences. The discussions generally took place at the key informant's home or at a school. At the beginning, the moderator introduced the note-taker and all participants, explained the general topic of discussion and encouraged each participant to express her ideas.

The work was facilitated by a network of female village-based informants (VBI). These women were recruited from among the pregnant women and mothers of young infants based in the study areas. The selection criteria included being late in pregnancy or having a baby under 2 months old; having at least primary education; good handwriting and oral communication skills; being a permanent resident with a good reputation and being accepted by women of all age groups. The VBI were trained to carry out informal interviews in their community and to keep notebooks in which to record observations and discussions that they had with mothers and other community members about maternal and child health issues. They were debriefed and interviewed quarterly by members of the social science team.

The discussion guide, which was similar for in-depth interviews and FGDs, was prepared by one of us (MM) and translated into Swahili. The main topics in the discussion guide were place of childbirth; birth preparedness at the household and community level; intrapartum and immediate newborn care; newborn care-seeking; cord care; feeding practices and overcoming barriers. As well as in-depth interviews and FGDs we also included case studies of four women who had recently given birth, each from a different village. These were noted by the VBI and followed up with interviews by the study team. Two of their babies died and two survived. These methods enabled us to collect information from a relatively wide range of participants and three different sources in order to increase validity and the reliability of the outcomes.

We obtained oral informed consent at the start of each interview or FGD. Confidentiality of all study participants was assured and village names have been coded in this manuscript. The discussions were recorded using an MP3 voice recorder. After each interview or FGD, handwritten notes were reviewed and revised while listening to the recording. The transcripts were typed and imported to NVivo version 2.0 (QSR International, Doncaster, Australia) for analysis. We applied qualitative content analysis, identifying major key themes from the coded transcripts (Hsieh and Sarah, 2005; Pope et al., 2000; Ritchie and Spencer, 1993).

3. Results

The results are broadly categorized into three areas: birth preparedness at the household and community level, intrapartum and immediate newborn care and newborn care-seeking.

3.1. Birth preparedness at the household and community level

Reported preparations for birth included rest and preparing cash for emergencies. Some women decide to move to their mother's household 2 weeks or 1 month before the expected

date of childbirth because they believe that parents provide the best care.

“Quite often pregnant mothers move to their parents to seek help when they are 9 months into their pregnancy.” (In-depth interview with a TBA, Village K)

“There are some women who move to their parents to deliver but other husbands prefer their wives to deliver at home so that if need to go to a health facility arises, husbands can act immediately.” (FGD with a mother of a neonate, Village N)

During this period (8–9 months of pregnancy), pregnant woman were reported to need to rest and to avoid heavy work such as fetching water, collecting firewood and farm work.

“A pregnant woman should avoid heavy labour as it may lead to miscarriage.” (In-depth interview with VBI, Village M)

Women also make sure that there is money for emergencies, in case they need to deliver at a health facility. Lengths of cotton cloth are also prepared for wrapping the newborn. For home birth, money needed is for razor blades, thread and gloves.

“At home you are obliged to prepare clothes, razor blades, thread and gloves but in the hospital you need more than that, new or clean clothes and money.” (In-depth interview with VBI, Village C)

“A household with poor income can risk the lives of mother and the newborn because of lack of money. Even if you are advised to go to the health facility and you have no means, you just take the risk of home birth.” (In-depth interview with a pregnant woman, Village H)

3.2. Intrapartum and immediate newborn care, including hygiene

3.2.1. Birth attendant

For childbirth at home, a close relative is usually expected to assist. If there is no close relative, any adult woman who is familiar with childbirth is allowed to assist. Grandmothers, mothers, sisters and aunts were frequently reported as having assisted at deliveries. Neighbours were also mentioned to assist birth at home.

“...any person who is courageous can help during childbirth. Even a non-relative can help if there is no relative.” (In-depth interview, Village R)

“My neighbour came to support me during childbirth as there was no-one else to help.” (FGD with mothers who gave birth at home, Village K)

It was also reported from most FGDs and in-depth interviews that TBAs commonly assist at childbirth. TBAs were usually paid between 2000 and 3000 Tanzanian shillings (equivalent to US\$1.5–2.5) or were given a piece of cloth as compensation.

“We have been asked to stop helping women to give birth at home but still we get complaints from our clients when

we refuse to help them. It is relatively cheap to give birth at home.” (In-depth interview with a TBA, Village R)

In rare cases, women who had delivered three or more times were reported to be confident to deliver at home without any assistance at all. Such women often give birth onto a bed covered with cotton sheets, a woven grass mat or cloths, and sometimes onto the ground, ignoring hygiene care during childbirth.

“In the morning, of 7th April 2005 I gave birth alone at home. The baby fell on the ground. My other children who were playing around the house heard a small baby crying and went to inform my sister who assisted me to deliver the placenta and care for the baby.” (In-depth interview with VBI, Village N)

3.2.2. Place of birth

Childbirth at a health facility was also reported in nearly all FGDs and in-depth interviews. For those who delivered at health facilities, the procedures were perceived to be different from those at home. It was reported that the umbilical cord is usually cut using scissors or a razor and then tied with a special thread. In addition, the baby is weighed and the mother advised by a nurse or midwife to breastfeed the baby immediately. The following case was typical for immediate newborn care in a health facility:

“I went to the dispensary around 11 pm. I gave birth the next day at 8 pm. The nurse took the baby, cut the cord with a razor and tied it with a special knot and moved the baby up and down which made him cry. The child was taken care of by a nurse, wiped with a damp cloth and then the nurse told me to breastfeed the baby. I was discharged at 10 am on the following day. At home, my aunt took the baby and bathed him with warm water.” (In-depth interview with a mother of neonate, Village R)

“There is a difference between home and hospital delivery. In a health facility, a woman is injected with some medicines to prevent loss of blood while nothing is applied at home and beds are also different.” (In-depth interview with a TBA, Village K)

In most FGD and in-depth interviews, it was reported that the nurses at antenatal clinics advise mothers to go to the health facility to give birth.

“I was advised to go to Mtwara or Lindi hospitals, but ended up delivering a baby boy at the local dispensary because I had little financial support. The nurse cut the baby’s cord, cleaned the baby using cotton wool and bathed him afterwards.” (In-depth interview with VBI, Village H)

3.2.3. Breathing and resuscitation

The neonate’s nose or mouth is normally inspected and cleaned with a piece of cloth. Sometimes fluids in the nose are removed by the mother or any other person close to the family by sucking the baby’s nose. The baby is often also held upside down to encourage him or her to cry.

“If the baby doesn’t cry it is an indication that there is a problem. He or she might be forced to cry by being held

upside down or immersed in cold water up to the neck.” (In-depth interview with VBI, Village C)

“When babies are born either at home or in hospital, they are held upside down to make them cry [which is] a sign of good health; the cord is cut and the baby is put on the bed to allow the mother to care of him or her. A baby is bathed the next day.” (FGD with mothers of neonates, Village H)

Occasionally, the baby is made to inhale the scent of tobacco powder (ground tobacco leaves) to make the baby sneeze. This was reported to be a good sign, indicating that the baby is mature and healthy.

3.2.4. Cord cutting and care

For home births, the cord is usually cut with a razor blade and tied with thread. Sometimes a part of the millet stem is used for cutting. Razor blades are often not new. Traditional herbs mixed with either cooking oil or water that has been used to wash an adult woman’s genitals (*numbati*) is applied to heal the cord. Other healing materials mentioned were ash, breast milk, fluid from pumpkin flowers and a powder ground from a local tree. A person with ‘a good hand’ and who can make the cord fall off quickly is usually chosen to cut the cord.

“Force should not be applied to make the cord fall off, even if it is about to fall off, better wait for it to fall off itself.” (In-depth interview with a mother of a neonate, Village C)

“If the cord doesn’t heal we apply modern medicine but other people use cow dung, ash or mgongo-tree powder.” (In-depth interview, a follow up with VBI, Village C)

“Many children are taken to the health facilities but breast milk and fluids from pumpkin flowers are also locally used to heal the cord.” (In-depth interview with a TBA, Village K)

In an in-depth interview, a mother who had lost her newborn reported the details of the circumstances of the child’s death.

“I had a sudden onset of labour and decided to give birth at home. I delivered a baby boy on 23rd April 2005. My mother and my neighbours assisted me. Five days later, my baby stopped breastfeeding and I realized that he was not feeling well. We decided to take him to the dispensary and were referred to the hospital, half an hour drive from my village. He was examined and the result showed that he had tetanus. He died on the same day, just before the treatment.” (In-depth interview with a mother of a newborn baby, Village K)

Apparently, an old razor blade that had not been cleaned was used to cut the cord of the child. The doctor concluded that the child was infected with tetanus through the use of the old razor blade.

3.2.5. Bathing and provision of warmth

At home, the baby’s body may be wiped with a piece of cloth and sometimes washed with warm or even cold water

on the day of delivery. After childbirth in a health facility the baby is not bathed but wiped with cotton wool. Although the majority of neonates were reported to be bathed on their first day of life, in a few areas it was reported that they were not bathed until after the cord fell off.

“We normally clean the baby after birth with cloth and with water on the following day. But in [the TBA’s] absence, [relatives and other birth assistants] wash the baby with water soon after childbirth. We used to get cotton wool from the health facility but now we don’t get it anymore.” (In-depth interview with a TBA, Village L)

After birth, sesame or other cooking oil is applied on the body to soften the skin and warm the baby. Thick pieces of cotton cloth are also used to wrap the newborn to keep it warm.

3.2.6. Feeding practices

Although most newborns are breastfed during the first day of life we learnt that some neonates are denied colostrum, which is perceived as dirty. In addition, mothers often feel they do not have enough milk for the first few days so the majority of neonates are given sweetened warm water at this time.

“First milk is not suitable for the newborn. The child is given sweetened water so as to wait for at least two or three days for the [dirty milk] to get finished.” (In-depth interview with a TBA, Village T)

“During the first day, I had no milk in my breasts; it was just unclean and water-like milk. The baby had to clean the breast.” (In-depth interview with a mother, Village C)

“After delivery I could not feed my child because there was nothing in my breasts. I just mixed some sugar with warm water to feed it.” (In-depth interview with a mother, Village H)

“I started breastfeeding my child on the second day after her birth. In the meantime, I gave her sweetened warm water.” (In-depth interview with a mother, Village K)

A neonate was considered to be vulnerable to breastfeeding problems. In some FGDs women reported deaths as a result of these problems. The average period of breastfeeding was 18–24 months. Another pregnancy (conceived while breastfeeding) and illness were the main reason for ending breastfeeding before this time.

3.2.7. Recognition of low birth weight

Although it is believed that a premature baby cannot survive, sometimes it was reported that a baby born 2 months early can survive. A premature baby was perceived by the community as a baby born before 9 months’ gestation.

“A baby of less than 9 months gestation is regarded as premature.” (In-depth interview with VBI, Village H)

“If a baby is born premature, I usually instruct a mother to send that child to the hospital. This happens when a

mother has malaria. A child born at 6 or 7 months gestation can survive while a child born at 8 months’ gestation can hardly survive.” (In-depth interview with a TBA, Village K)

It is generally understood by the community that a baby born at 8 months is more likely to die than one born earlier, because the baby is thought to be turning at this time. It is thought that baby is facing sideways during the eighth month and thus more likely to become stuck.

3.2.8. Seclusion and protection at home

Typically, the baby is strictly kept indoors with his or her mother and close relatives until the cord falls off, which is usually between 3 and 7 days after birth. During this time it is believed that the neonate is vulnerable to harm by people with malevolent intentions. In order to make sure that the cord does not fall on the ground, the child is well protected with clothes. It is believed that if the cord falls on the ground without the mother’s knowledge it may be picked up by ‘bad people’. Although respondents expected that the mother of a newborn should be visited to congratulate her and her baby, it was acknowledged that not all people come with good intentions.

“Some people can just bring nyambu [a form of witchcraft] to the child. It is important for the mother of the neonate to watch out because bad people can be tempted to steal the cord and harm the child.” (In-depth interview with a mother, Village R)

“Bad people are enemies of children; they can harm a mother and child through witchcraft.” (In-depth interview with VBI, Village R)

Mothers stay at home in order to protect the neonates against witchcraft. This is important since a bad person might sneak into the home and steal the umbilical cord as a means to harm the child. The cord falling off is considered a very important event. This occasion often marks the first time baby is taken out of the room to be named and shaved. The hair and cord are kept in a safe place to avoid their appropriation by ‘bad people’. Fear of the umbilical cord being stolen justifies seclusion until it drops off. The cord and hair might be buried covered by a piece of broken pot on top, or more simply buried under a big tree. It seems that every family has a sacred place in the forest where they bury such things. This location is very secret to protect the things that are buried and to protect the family. Sometimes the cord is hidden after being neutralized by ash, so that if taken by witchcraft a child cannot be harmed.

Special ceremonies are held for the first-born child after the cord falls off. Those invited include grandmothers, close relatives and neighbours. In these ceremonies the mother of the neonate is taught how to care for the newborn. The child’s grandmother, who may be a TBA, is assigned to teach the baby’s mother some important lessons about child rearing. For example, mothers of neonates are told not to have sex, even with their husbands, unless their babies are protected with amulets or herbal powders applied into incisions on the baby’s head. This is seen as an essential measure to protect the child from poor health. Breaking this taboo leads

to sunken fontanelle, frequent illness and delay in walking (*kumtimbangila mwana*).

“Interviewer: So what is the protection for *kumtimbangila mwana*?
 Respondent: Abandon sex.
 Interviewer: For how long?
 Respondent: For maybe two years, until the baby has stopped breastfeeding and has been sent to her grandmother.” (In-depth interview with VBI, Village L)

“Just after giving birth for the first time I was told [by adult women] to abstain from sex for 2 years while breastfeeding, otherwise the baby could die. For this reason, I was very frightened and decided to abide by that custom.” (FGD with mothers, Village H)

The mother and the neonate are commonly secluded indoors for 40 days. In addition to the protection against witchcraft, the seclusion allows mothers to regain energy lost during delivery, and more importantly, to become purified after the perceived pollution of pregnancy (*luhuli*). During the 40-day period, *luhuli* will gradually diminish.

“In these 40 days I had to rest to get back the energy lost during childbirth and to protect my child and myself against pollution.” (In-depth interview with VBI, Village H)

“[but] for us, it is when you finish these 40 days that one can bathe and start praying. For those who do not pray, they cannot even recall how many days have passed.” (In-depth interview with VBI, Village C)

However, this rule of seclusion does not apply to sick neonates; they can be brought to a health facility or traditional healer if the need arises. It is believed that non-adherence to being secluded at home can cause swelling in the mother's body.

3.3. Newborn care-seeking

When looking at the formal health system, the majority of mothers reported that they knew what action to take when the baby became sick, but accessibility, lack of money, lack of drugs and abusive language by health personnel were mentioned as barriers to neonatal care-seeking:

“For most of us who give birth at home, when we present ourselves to the health facility we are made to pay between 500 and 1000 Tanzanian Shillings. For most of us this is a barrier to seek care from the health facilities as we have no money.” (In-depth interview with a mother, Village R)

“At health facilities we are being treated like little children. Some health personnel use abusive language even if someone has done nothing. With that kind of environment you can hardly tell a doctor all about your newborn health-related problems.” (In-depth interview with a mother, Village N)

“Sometimes when a young pregnant girl goes to the clinic, it can be shameful for her as some health workers

can lament about how it is wonderful to see a little child like her running after adult women's business.” (FGD with a mother of a neonate, Village T)

With regard to local and traditional treatments, there are some illnesses which are treated with local medicine at home, while other medicines are sought from traditional healers. In some areas the child is protected against convulsions by grinding the detached umbilical stump into a powder, which is rubbed into an incision made on the baby's head. Traditional healers use this type of scarring to protect young children from harm and to protect the baby against convulsions. In addition, neonates are occasionally given crocodile oil to relieve perceived stomach pain. However, this practice is diminishing and not very common nowadays. The most common practice to relieve perceived neonatal stomach pain is the use of seed oil from a local tree. This usually happens in the early stages after childbirth. Stomach pain is diagnosed if the baby is crying all the time, or is constipated.

Breast milk is also believed to be a cure for eye infections and newborn genital pains. Eye illnesses are treated by drops of mother's breast milk. Breast milk can be applied to the child's genitals as a cure for a newborn experiencing pain from urinating. Breast milk from a mother of twins can also be used to heal eyes and wounds. Babies with an eye problem or a wound in the mouth are treated with spittle from a mother or father of twins. Babies with pneumonia, convulsions and any illness associated with spirits and witchcraft are usually taken to traditional healers. Evil spirits were reported as a source of childhood illness in nearly all FGD and in-depth interviews.

“I delivered a premature [8 months] baby boy at home. He was weak and couldn't suck properly. The grandmother went to inform his father about the child's situation and decided to take him to the traditional healer for treatment. It was learned that the child had a devil. The healer gave us some herbs and advised us to give them to the baby at home, but the child died on our way back.” (In-depth interview with a mother of a neonate, Village H)

Traditional healers are widely believed to be able to heal sick neonates and are therefore often consulted. Unlike most health facilities they treat on credit and accept payment in kind (exchange of goods for services). Reported signs of neonatal illness include problems with breastfeeding, a hot body and crying. Mothers discuss issues related to child-care with their female friends, husbands, aunts and other close female relatives.

4. Discussion

We have described both favourable and risky cultural practices related to newborn care in rural Tanzania. Babies are especially vulnerable during their first days and weeks and while favourable cultural practices such as warming and prolonged breastfeeding should be encouraged, those that impact negatively on neonatal and maternal health should be discouraged. The newborn takes time to adapt to the environment outside the mothers' womb. Establishment of normal respiration, maintenance of warmth and

protection from infection are particularly important at this time (Ebrahim et al., 1998). Immediate immersion of the baby in cold water can lead to an increased risk of hypothermia. There is much evidence to suggest that neonates who are not thermally regulated have a significantly higher risk of morbidity and mortality (Beck et al., 2004; Johanson et al., 1992; Lyon, 2004; Sinclair, 1992). Preterm, low birth weight or distressed neonates are more susceptible to hypothermia (McCall et al., 2005; WHO, 1997). The results from this study also indicate that the mode of cord cutting in rural areas might contribute to neonatal deaths through infection. Umbilical cord infection contributes significantly to newborn infection and subsequent neonatal death (WHO, 1998a). There is a need to encourage the use of new razor blades and sterilized instruments for cord cutting. Home medication to heal the cord stump should be avoided as this might lead to serious infections. Early use of 4.0% chlorhexidine for topical cord antisepsis represents an important intervention to reduce neonatal infections and mortality (Mullany et al., 2006).

Common barriers discouraging seeking care for the newborn from formal health facilities include lack of money and lack of reliable transport to the facility (Borghi et al., 2006; Ensor and Cooper, 2004; Koblinsky et al., 2006). Delivery at health facilities needs to be more easily accessible (Campbell and Graham, 2006; Koblinsky, 2006; Ronsmans and Graham, 2006), although it should be noted that there is a major shortage of skilled birth attendants at peripheral health facilities in our study area. Our observations suggest that even mothers who are aware of the health risks in childbirth have problems accessing good care at health facilities due to lack of money, poor transport, abusive language and drug shortages (Mrisho et al., 2007). Moreover, health staff give more emphasis to advising primigravidae to give birth in a facility than to multigravid mothers. It is not entirely clear why this is the case, although it is likely that it stems from a general perception that first births are at a higher risk of complications than subsequent births. Families and health-care providers should collaborate in protecting the health of mothers and neonates through improved delivery practices.

The majority of newborns are denied colostrum and are fed sweetened warm water before breastfeeding or as a supplemental feed. This can, however, increase their risk of illnesses, particularly if the water is contaminated or the feeds reduce demand on maternal milk supply. Breast milk is a sole and sufficient source of nutrients during the first 6 months of life (WHO, 1998b, 2006) and has an impact on mortality and morbidity (Bhandari et al., 2003; Haider et al., 2000; Morrow et al., 1999). A recent study in Ghana has also shown an association between breastfeeding within an hour of birth and neonatal survival (Edmond et al., 2006; WHO, 2006). Our data suggest that newborns from the study areas are not always breastfed immediately after birth, and that exclusive breastfeeding is far from universal. The same phenomenon was reported from other parts of Tanzania (Armstrong-Schellenberg et al., 2002; Shirima et al., 2001). In this study, as in other reports, delay in initiation of breastfeeding and discarding of colostrum were common in rural areas (Davies-Adetugbo, 1997; Nath and Goswami, 1997; Okollo et al., 1999; Shirima et al., 2001). Lack of knowledge about the benefits of early and exclusive breastfeeding is widespread. Messages dis-

seminated through health education at antenatal visits are unlikely to be sufficient to change behaviour, which is likely to require consistent messages delivered from multiple sources. In rural Uttar Pradesh, India, community mobilization and behaviour-change communications to promote simple essential practices for newborn care at home and in the community were reported to lead to a 50% reduction in neonatal mortality (G. Darmstadt, unpublished.).

Healthcare-seeking behaviour for the newborn is influenced by many factors (Ahmed et al., 2001; Barnes-Josiah et al., 1998; De Zoysa et al., 1998; Lawn and Kerber, 2006; Marsh et al., 2002; Winch et al., 2005). Very few facilities in Tanzania have equipment and supplies to manage complications of labour and delivery or provide emergency support for the newborn (NBS [Tanzania] and ORC Macro, 2007). The restriction of the movement of mother and newborn outside the home is potentially risky and a potentially limiting factor for care-seeking (Mesko et al., 2003; Winch et al., 2005). In our study areas, seclusion of both mother and baby was reported to be 40 days, which is similar to that reported in other parts of the world (Blanchet, 1984; Gideon, 1962; Jeffery et al., 1989; Winch et al., 2005). Families often perceive this as way to protect the child against witchcraft. Traditional healers are contacted frequently, which is mainly due to the fact that, as in Uganda (Amooti-Kaguna and Nuwaha, 2000), they accept payment in kind, that is services are provided in return for goods, and payment rates can be negotiated. However, some rituals such as feeding of neonates with crocodile oil and incisions made on the baby's head by traditional healers may risk infection. Encouraging traditional healers to refer sick newborns to the formal health system may help to save lives.

In recent years, opinions about the use of TBAs have varied widely. TBAs are reported to be key providers of support and opinion and have great potential, if well trained, to promote appropriate newborn care and practices in the community (Barnett et al., 2005). In a meta-analysis of 60 studies, training TBAs was associated with significant improvements in performance and perinatal mortality (Sibley and Sipe, 2004). However, the training of TBAs without the support of skilled backup services does not reduce the maternal mortality rate (Alisjahbana et al., 1995; Greenwood et al., 1987). It has been recommended that this strategy be replaced by training of professional midwives (De Brouwere et al., 1998).

The health facility continuum-of-care approach promotes care for mothers and their children from pregnancy and childbirth, through the immediate postnatal period and childhood, recognizing that safe childbirth is critical to the health of both the woman and the newborn baby and that a healthy start in life is an essential step towards a sound childhood and a productive adulthood (Tinker et al., 2005). Another dimension of continuum-of-care is required to link households to health facilities by improving home-based practices, mobilizing families to seek the care they need and increasing access to the care at health facilities (Tinker et al., 2005; WHO, 2004). Another possible lesson from these findings is for the programmes to integrate community- and facility-based care. In a small-scale research setting, home-based neonatal care was shown to work in Asian countries (Bang et al., 1999; Darmstadt et al., 2005) and might be appropriate in some African settings.

Outreach and health education of families and communities to promote the adoption of evidence-based home-care practices and create demand for skilled care can bring early success in averting neonatal deaths (Darmstadt et al., 2005). Investing in scientific and technical advancement is a necessary step to improve neonatal and maternal health, but social changes empowered by a strong political will should not be ignored (De Brouwere et al., 1998).

Quantitative studies are needed to assess the prevalence of these practices in different settings. For example, it is important to establish how frequently mothers delay initiation of breastfeeding and how commonly a mother would leave her house with a sick neonate to seek care. In addition, operational research is needed to improve links between communities and different levels of health facilities.

Our study has limitations and strengths that should be borne in mind. The study reveals cultural variations in newborn home-based care practices, which means that the results may not be generalisable to all women in Lindi and Mtwara regions or to other parts of the country. Furthermore, the study was based on retrospective reports of childcare practices and may be subject to recall bias. However, FGDs were used with individual follow-up interviews to explore specific opinions and experiences in depth as well as to produce narratives that address the continuity of personal experience over time (Duncan and Morgan, 1994). Our attempts to triangulate findings from different data sources were intended to maximize the reliability of the results and reduce potential biases (Patton, 2002). Thus, despite these potential concerns, our findings can inform the development of intervention strategies aimed at saving the lives of newborn babies.

In conclusion, we have demonstrated the existence of household and community birth preparedness efforts in southern Tanzania. However, access to effective, appropriate and skilled assistance for delivery poses a great challenge. Reliance on a wide range of unskilled birth assistants contributes to a lack of immediate appropriate care for both the mother and the newborn. Behaviour-change efforts to foster appropriate early newborn care practices are crucial to the success of neonatal survival programmes. A strong emphasis should be put on making simple and affordable interventions easily available through the health system and at the community level. Advice needs to be widely available on warming of the newborn soon after childbirth, proper hygiene and care at childbirth, and early and exclusive breastfeeding. These findings will contribute to the development of a programme for improving maternal and newborn care in rural Tanzania.

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