MASTER'S THESIS

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Experiences from the establishment of the first human milk bank in Viet Nam

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Abstract

Background: Mothers` milk is essential to cover nutritional needs for growing infants, especially for those who are premature or sick because they are at a greater risk of death than full term infants. Studies have shown that donor human milk is the best alternative for infants without access to own mothers milk. By establishing human milk banks, these infants have a better chance at survival and optimal development.

Objectives: The over-all objectives in this master thesis is to describe experiences from the establishment of the first human milk bank (HMB) in Viet Nam. Background characteristics of the HMB in Viet Nam will be presented followed by a description of the experiences from the establishment.

Method: Descriptive data was collected from the HMB in Da Nang Women's and Children's Hospital by Alive & Thrive (A&T) through a monitoring system. The data covers a seven month period from February to August 2017. Qualitative data was collected by observations from the field visit at the HMB and interviews of eight informants from the HMB staff and staff from Alive & Thrive and PATH.

Results: During the first seven months, the number of infants who started receiving pasteurized donor human milk (PDHM) increased with 2215 %. The amount of PDHM fed to infants increased with 1856 %. Fifty-six percent of all donor mothers were mothers of preterm infants. The main reasons for mothers to donate their breastmilk was a wish to "give back" since they previously had received PDHM. The HMB might have a positive effect on breastfeeding practices at the hospital due to increased awareness and information sharing. Challenges were donor recruitment from outside the hospital, getting funds for additional staff at the HMB and disposal of donor milk.

Conclusion: There is a clear need for HMB's in Viet Nam given the increasing numbers of infants receiving PDHM. Future studies might be needed to find productive ways to recruit donors from outside the hospital.

Keywords: Human milk bank, breastfeeding, Infant and young child feeding, infant nutrition, Viet Nam

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List of Abbreviations

A&T	Alive & Thrive
DNHWC	Da Nang Hospital for Women and Children
DOH	Department Of Health
EENC	Early Essential Newborn Care
HACCP	Hazard Analysis Critical Control Points
HMB	Human Milk Bank
IYCF	Infant and Young Child Feeding
KMC	Kangaroo Mother Care
LBW	Low Birth Weight
MDG	Millennium Development Goals
MM	Mothers Milk
NEC	Necrotizing Enterocolitis
NICU	Neonatal Intensive Care Unit
PDHM	Pasteurized Donor Human Milk
SDG	Sustainable Development Goals
UNICEF	United Nations Children's Found
WHO	World Health Organization

1.0. Introduction and study objectives

It has been estimated that the death of about 823 000 children under 5 years of age could be avoided globally each year through breastfeeding (Victora et al., 2016). Mothers` milk is essential to cover nutritional needs for growing infants, and globally it is considered as an important factor for child survival, especially for premature or sick infants (Black et al., 2013; Gartner & Eidelman, 2005). When a newborn does not have access to his or her own mother's milk, the risk of infectious diseases increases due to lack of antibodies received through mother's milk. In addition, the risk of malnutrition might increase (PATH, 2013). These infants also have a decreased chance of survival and it is important that they get an alternative to mothers' milk that is mutually nutritious. In addition to being nutritionally important, breastfeeding is shown to increase intelligence and improve school achievements, protect against child infections and malocclusion and might also have a protective effect against overweigh and diabetes later in life (Hansen, 2016; Victora et al., 2016). Breastfeeding is not only important for infants; for the mother, it also reduces the risk of breast cancer and might reduce the risk of ovarian cancer and type 2 diabetes (Victora et al., 2016).

The prevalence of breastfeeding worldwide, however, is below the recommended level. In low and middle-income countries, only 37 % of infants are being exclusively breastfed for the first six months of life and it appears to be even lower in high-income countries (Victora et al., 2016). The breastfeeding rates appear to be declining as country income is increasing (Victora et al., 2016; Walters et al., 2016). In Southeast Asia, exclusive breastfeeding rates varies between low and middle income countries (Walters et al., 2016). In Cambodia, a low-income country, the prevalence of exclusive breastfeeding is 73 % respectively, while in Viet Nam and Thailand, upper-middle income countries, the prevalence is 15 to 17 %. WHO and UNICEF have developed a "Global Strategy for Infant and young Child Feeding" to shed some light on the importance of good feeding practices and the impact it has on survival, good health, growth and development for infants and young children (World Health Organization, 2003). These strategies are based upon the significance of nutrition and its importance in the first period of life to achieve optimal health. In addition, all children have a right to the highest attainable standard of health, as stated in the Convention on the Rights of the Child, which includes the right to adequate nutrition (UnitedNations, 1990).

Not all infants have access to own mother's milk and for these infants it is important with an alternative source to nutrition. For this purpose, the first human milk bank was established already in 1909 in Vienna, Austria (Kim & Unger, 2010). By establishing human milk banks (HMB's), infants that do not have access to their own mothers` milk, are premature or sick have a better chance at survival and development in their first period of life by receiving donor milk (PATH, 2013). To improve newborn care and to ensure that all infants get an equal start of life, human milk banks has been established in several countries all over the world.

This master thesis will focus on the establishment of the first HMB in Viet Nam, located at The Women's' and Children's hospital in Da Nang (DNHWC). The thesis is based on descriptive data collected by Alive and Thrive (A&T) Viet Nam, and qualitative data gathered by the author through observations at the HMB and interviews with HMB staff in Viet Nam, A&T and PATH. The author visited the HMB both before and after the opening. The first visit was during the period between October 20th and November 20th 2016, and the second visit was during the period March 20th to April 20th 2017.

1.1. Collaboration

This thesis is written in collaboration with Oslo and Akershus University College of Applied Sciences, A&T Viet Nam and the Norwegian National Advisory Unit on Breastfeeding. A&T works in partnership with PATH, the Ministry of Health, the Da Nang Department of Health, The National institute of Nutrition, The Women's Union, The General Confederation of Labor, the Institute of Legislative Studies, provincial authorities and UNICEF and is funded by the Bill & Melinda Gates Foundation (Alive & Thrive, 2009). The A&T initiative was established in 2009 based on the high prevalence of stunting (reduced growth rate due to malnutrition). Their main goal is to improve infant and young child feeding by establishing proof of concept to find new approaches, and behavior change to improve nutrition practices in the first period of life to develop both physical and mental capacity (Alive & Thrive, 2009). The A&T programs focus on early initiation of breastfeeding from birth, and exclusive breastfeeding during the first six month of life. In addition they work towards providing women with knowledge regarding diets and nutrition supplements during pregnancy and in the postpartum period.

1.2. Study objectives

The main objective in this master thesis is to describe experiences from the establishment of the first human milk bank in Viet Nam. First background characteristics of the HMB in Viet Nam will be presented followed by a description of the experiences from the establishment.

The specific objectives are:

1. To present background characteristics of the HMB donors
2. To present background characteristics of the first HMB in Viet Nam
3. To describe the experiences from the establishment of the first HMB in Viet Nam
    a. Why do mothers choose to donate, and how is the HMB recruiting donor mothers?
    b. Has there been changes in breastfeeding practices at the hospital after the HMB?
    c. What were the challenges that occurred during the establishment of the first HMB in Viet Nam?

2.0. Theoretical background

2.1. Child survival

There are differences between low-and middle income countries and high income countries when it comes to child survival and death before the age of five (UNICEF, 2016). It is shown that children born in the poorest areas of the world (e.g. sub-Saharan Africa) are twelve times more likely to die before the age of five compared to children born in high-income countries. In 2015, 5.9 million children died before the age of five and roughly 1 million of these children died on their first day of life. In South Asia, Eastern, Southern, West and Central Africa, the leading causes of death amongst these children were diarrhea and pneumonia.

The risk of child mortality increases for people living in poverty with lack of access to land or property rights (UNICEF, 2016). These groups are often living in urban slums which makes them particularly exposed because of overcrowding, lack of access to health services, unsanitary conditions and high transportation costs, just to mention a few. Another risk factor is climate change because it might reduce access to clean drinking water from drought. Unsafe drinking water is a risk factor for diseases such as diarrhea and cholera. In addition, climate change has a negative impact on access to food, and a result of this is often malnutrition. In 2012, there were approximately 1000 deaths per day caused by unsafe water, unsanitary conditions and hygienic reasons.

In the year 2000, 189 countries represented by their leaders gathered to sign the Millennium Declaration created by the United Nations (SDG-Fund). This declaration included eight measurable goals (Millennium Development Goals, [MDG's]) for global improvement and was set to expire in 2015. Three of these goals included reduction of extreme poverty and hunger, reduction of child mortality and improve maternal health. However, in 2012 at the United Nations Conference on Sustainable Development in Rio de Janeiro, a new set of goals emerged to carry out the purpose of the MDG's for future global development beyond 2015. The new set of goals was the Sustainable Development Goals (SDGs) and was presented for the first time in July 2014. Some of the new set of goals included end of poverty, end of hunger, achieve food security and improved nutrition, ensure healthy lives and promote well-being for all ages and to reduce inequality within and among countries (Servaes, 2017). With the motto "no one left behind", the SDG's is the most ambitious set of universal goals.

In 1990, which was the benchmark year for the MDG's, deaths amongst children under five years of age in South-East Asia was 72 deaths per 1000 live child births (UNICEF, WHO, Bank & UN-DESA, 2015). The MDG's stated that the rate of under-five deaths should be reduced by two thirds by 2015, and by 2005 the under-five death rate was at 40 deaths per 1000 live births. For South-East Asia, their target by 2015 was to achieve 24 deaths per 1000 live birth, and they achieved 27 deaths per 1000 births with 3, 9 percent annual reduction rate between 1990 and 2015. To achieve an even lower child mortality rate, it will be necessary to focus on the children in the first period of life (first 28 days), the neonatal period. This is the most vulnerable time for survival, and the reduction of neonatal deaths seems to be slower than the reduction of post-neonatal under-five deaths. In South-East Asia, there were 28 neonatal deaths per 1000 live birth in 1990 and 13 per 1000 in 2015. Although there was a 52 percent reduction, they did not achieve the MDG of reducing deaths by two thirds. To reduce these numbers further, countries have to focus on pregnant women and newborns receiving good quality care during pregnancy, at childbirth and in the post-natal period. In addition to care, it is of great importance to promote breastfeeding to women since breastfeeding is essential for child survival to avoid diseases such as diarrhea and pneumonia (Bhutta et al., 2013; WHO/UNICEF, 2014).

2.2. Premature infant nutrition

Premature infants are in general at a higher risk of death than full term infants (World Health Organization, 2003). One reason is the high risk of necrotizing enterocolitis (NEC). NEC normally occurs in preterm infants during the first few weeks of life and is the worst gastrointestinal disease among neonates and it is often seen in preterm infants fed with formula (Feldens, Souza & Fraga, 2017). NEC is typically recognized as damage to the intestinal tract and has a mortality rate of 20% – 50 %. It is therefore important with well-established feeding practices to accomplish healthy development and growth (World Health Organization, 2003). In addition, the postpartum period can be critical for preterm infants in terms of neurodevelopment, and right nutrition during this time is essential (MacGuire, Henderson & Fowlie, 2004; Tudehope, 2013). Feeding guidelines for preterm infant's state that the best feeding practice is to provide them with fortified mother's milk from their own mother (Tudehope, 2013). However, the average breastfeeding rate for preterm infants when discharged is 50 %, and mothers of preterm infants often struggle with breastfeeding and lactation at a higher degree than mothers of full term infants. In addition, preterm infants might have a reduced ability to breastfeed and therefore have to be fed through a probe during the first period of life. It is essential that mothers of preterm infants learn milk expression techniques to maintain milk production to achieve exclusive breastfeeding after hospital discharge (Tudehope, 2013).

When premature infants receive mothers milk (MM), fortification is sometimes necessary due to the composition of nutrient in the milk not being nutritionally adequate to the preterm infant's needs (Tudehope, 2013). There has been some discussion on the subject of what is the best alternative for feeding preterm infants (Cohen & McCallie, 2012). WHO recommends own mothers milk as the top recommendation for both preterm and full term infants, and if own mothers milk is not available they recommend donor milk from HMB's. It is important to mention that milk from the HMB are in most cases pasteurized and therefore might lack some important components such as lipase and lymphocytes (Tudehope, 2013).

2.3. Recommendations

WHO recommends initiation of breastfeeding during the first hour after birth, and exclusive breastfeeding for the first six months of life for optimal health, growth and development for all infants (Bhutta et al., 2013; World Health Organization, 2003). Exclusive breastfeeding means that no other food or drink should be given in addition to mother's milk. After the first

six months, infants should be introduced to complementary food in addition to breastfeeding until two years of age (or longer).
If mother's own milk is not available, the second recommendation is donor milk from human milk banks (World Health Organization, 2003).

2.4. Human milk banking

The first HMB was established in Vienna, Austria already in 1909 as an alternative for wet nursing (Haiden & Ziegler, 2016). Shortly after that, the first HMB in The United States opened in Boston. During the 1960's, neonatal medical care was advanced and high-quality formula was developed which led to a decrease in the process of developing HMB's. Later, in the 1980's when HIV appeared, a lot of milk banks had to be closed due to transmission of HIV through donor human milk. After this period serological testing was required for all donor mothers who contributed as a financial burden for some HMB's and led them to close down. Today it is recommended that all donor milk (all other human milk that is not mothers own breastmilk) should be provided by established HMB's that follows strict operating procedures and safety guidelines (Haiden & Ziegler, 2016).

Globally, milk banking activities varies a lot due to economic, religious and cultural differences (Haiden & Ziegler, 2016). However, there are a set of recommendations on how to run and establish HMB's across countries in regards to safe practices. There has been an increase worldwide in the importance of human milk and focus on infant and young child feeding (IYCF) and today a lot of countries are currently working on developing HMBs.

2.4.1. Donor selection

To ensure that donor milk is as safe as possible, strict guidelines are established to become a HMB donor (Arslanoglu et al., 2010; Baumer, 2004; Helsetilsynet, 2002). When selecting donors, it is important that it is in the best interest for both the receiver and the donor herself and that the donor mother still is capable of breastfeeding her own infant exclusively (Arslanoglu et al., 2010; Haiden & Ziegler, 2016). It usually starts with an interview done by qualified personnel, followed by a questionnaire filled out after the interview. This questionnaire includes a consent form for the potential donor to sign that needs to be delivered to the hospital/HMB. Donors have to be of good health and be able to understand given information and follow hygienic measures that are required. Donors should disclose if they (or their sexual partner) belong in a risk group for HIV/AIDS or other infectious diseases that can be transmitted through breastmilk (Hartmann, Pang, Keil, Hartmann & Simmer, 2007;

Helsetilsynet, 2002). They should also disclose if they are suffering from, or have suffered from a general dangerous disease, and if so which one. They should disclose whether they have taken any piercings or tattoos, or if they have received blood transfusion or a transplanted organ or tissue during the past 12 months. They are required to disclose use of tobacco, alcohol and use of illegal or prescript drugs or medication. If this is satisfactory, the next step is serological testing for HIV, hepatitis B and C, cytomegalovirus (CMV), syphilis and human T-cell leukemia virus 1 and 2. In some HMB's serological testing is repeated after three months (Hartmann et al., 2007; Helsetilsynet, 2002). After testing, the donors receives pumping equipment from the hospital/HMB and go through training on how to use it correctly in regards to hygiene and pumping methods. It is important to mention that the donor can change her mind at any time if she regrets her decision on becoming a donor (Arslanoglu et al., 2010; Helsetilsynet, 2002).

2.4.2. Milk expression and storing

After the donors have successfully gone through donor recruitment, there are standard operating procedures for storage and collection of donated milk (Arslanoglu et al., 2010). There is a high risk for bacterial growth in breastmilk, so hygienic measures must be followed carefully to avoid contamination and milk disposal. HMB staff is responsible for teaching donor mothers how to collect and store donor milk according to procedures and it is recommended to give both oral and written information (Hartmann et al., 2007). Recommended procedures for milk expression are proper handwashing and cleaning of the breast (Arslanoglu et al., 2010; Helsetilsynet, 2002). When cleaning the breast, the areolar zone and nipple should be washed with running water or a clean gauze with water. Soap is not necessary because it might irritate the skin. When expressing, it is not recommended to collect drip milk from the breast that milk is not currently being expressed from. Donors can use either electric or manual breast pumps. It is also important to have routines for washing and disinfecting all equipment that has been in contact with breastmilk (Arslanoglu et al., 2010).

When breastmilk is collected from donor homes, there is always a risk of contamination (Arslanoglu et al., 2010). It is important that expressed breastmilk is stored in an appropriate way according to procedures from the HMB. To ensure that the milk to be traceable, bottles must always be labeled with the donors name or ID-number and date of expression (Arslanoglu et al., 2010; Nguyen, Alayon, Tran, Tran & Nemat, 2014). It is recommended that the breast milk should be cooled down as soon as possible after expression, and that it is stored in a sealed and sterile container. The container can be stored in a refrigerator (at $+4^0$C)

for 24 hours before being put in a freezer (-20^{0}C). When transporting the milk from donor homes to the HMB it should be facilitated so that the milk can arrive in frozen state. Preferably pickup will be arranged from the HMB, and if not, the HMB should provide donors with cooling equipment such as cooling bags or transport freezers (Arslanoglu et al., 2010; Helsetilsynet, 2002)

2.4.3. Operative procedure

Donor milk should undergo bacterial testing after arriving at the HMB (Arslanoglu et al., 2010). The donor milk should go through bacterial testing both before and after pasteurization. Before pasteurization, donor milk should be checked to see if there has been color changes or if there has occurred strange smells. If so, the milk is disposed. There are different criteria by different guidelines in regards to when donor milk is being disposed after bacterial testing before pasteurization (Arslanoglu et al., 2010):

<u>NICE guidelines:</u>
Total viable bacteria count > 10^5 CF/ml
Enterobacteriaceae >10^4 CFU/ml
S. aureus >10^4 CFU/ml

<u>Australian guidelines:</u>
Confluent bacterial growth >10^5 CFU
Any Enterobacteriacea, Enteroococci and potential pathogen capable of producing heat-stable enterotoxins

<u>French Legislation:</u>
Aerobic Flora >10^5 CFU/ml
S. coagulase positive >10^4 CFU/ml

<u>Swedish guidelines:</u>
Any pathogen bacteria
A. aureus >10^5 CFU/ml
Enterobacteriaceae >10^2 CFU/ml

According to recommendations, all donor milk that arrives at the HMB should undergo pasteurization (Arslanoglu et al., 2010). If the milk is frozen, it has to be defrosted before pasteurization and it has to be stored in sealed and sterile bottles. All of the containers that go in the pasteurizer should hold a similar amount of milk and should be filled to about 4/5 of the containers capacity. It is recommended that the donor milk is being pasteurized for 30 minutes at 62, 5 ^{0}C and any lower temperature is not acceptable. Throughout the pasteurization process, it is important to monitor the temperature thoroughly and it is therefore recommended to have a control bottle that is linked to a thermometer. 30 minutes starts when the control bottle reaches 62, 5 ^{0}C. After pasteurization it is important to cool down the bottles quickly, preferably with refrigerated water at 10 ^{0}C or lower. The temperature in the

milk bottles should drop from 62, 5 ^{0}C to 25^{0}C within ten minutes. All of the bottles must be labeled with donor ID and date of collection and pasteurization before storage.

2.4.4. Traceability of donor milk and documentation

In case of contamination, there has to be a system in place to trace the PDHM from donor to recipient, and from recipient back to donor while both parties remain anonymous (Hartmann et al., 2007; Helsetilsynet, 2002). Usually HMB's has an ID-system where each donor has their own ID-number linked to their name that is labeled on every container of milk that they donate. If an infant receives donor milk, it is marked in his or her patient journal with the milk-donors number-ID. It is required that all milk bank facilities have an internal control system to document their activities (Hartmann et al., 2007; Helsetilsynet, 2002). In addition to the amount of donated milk and date of donation, donors' medical records, questionnaires and serological test results should be documented and stored according to hospital policy as well (Hartmann et al., 2007). All documentation should be linked to the donors ID-number. It has to be procedures in place to ensure that all activities are planned, conducted and maintained accordingly to regulatory requirements.

2.4.5. Establishing a Human Milk Bank

It is well documented that breastfeeding increases child survival, health and normal growth amongst infants (Black et al., 2013; PATH, 2013; Victora et al., 2016). Human Milk Banking is a service that works to provide safe breast milk through milk donors to infants with lack of access to their own mothers milk, premature or sick infants or if mothers milk is not safe because of e.g. disease (Corpeleijn, Vermeulen, Van Vliet, Kruger & Van Goudoever, 2010).

Human milk banks (HMBs) is grounded in four basic activities (quality assurance, breastfeeding promotion and support, auditing and tracking, guidance for clinical provision of donor milk) that make five key pillars (PATH, 2013).

The first key pillar is safety which includes ongoing staff training for everyone working at a HMB facility (PATH, 2013). This point also covers the reduction of contaminants and toxins in addition to make transparent data for studies and product security. The second key pillar is quality. This point covers the nutritional and biological abilities of donor milk and quality assurance of the HMB. Methods for quality assurance must be in place and should include staff training in regards to hazard analysis critical control points (HACCP), safety regulations, quality control systems and technical skills. The third pillar is networking and information sharing, which includes timely documentation of data that should include activities completed

by the HMB and following results. To achieve good practices, HMB's should share information and experiences with other HMB's in similar situations and learn from each other. This can create good networks both nationally and internationally. Awareness, advocacy and promotion are the fourth pillar and covers support and counseling in regards to breastfeeding and lactation. This pillar is important in promoting the benefits of- and advocating for HMBs. Promotion should highlight the positive development a HMB might have in a community, and can also contribute to recruit donors. The last key pillar is sustainability. Sustainability includes establishment of supply and demands for the HMB, and support donor mothers in maintaining an adequate milk supply. Also, local stakeholders are being recruited for engagement and ownership. In terms of sustainability, it is also important to maintain good business practices and financial integrity.

2.4.6. Monitoring system

Another important concept in HMB is the monitoring system. The monitoring system is established to provide timely routine data to improve functionality of HMBs and to ensure that the activities of the HMB meet standardized protocols and provide data for studies (Nguyen et al., 2014). The monitoring system is collecting information such as statistics of Early Essential Newborn Care (EENC), information about the donated milk and the donor, information about processes, distribution and storage of donated milk, information about the recipients and information about the supportive supervision. The monitoring system is being explained further in chapter 3.1.

2.4.7. Establishing a base

To establish a human milk bank, it is necessary with a carefully planned system based on four key steps to make a successful human milk bank (PATH, 2013)

The first step in establishing a human milk bank is to have a solid base (PATH, 2013). This includes competent personnel, equipment, appropriate facilities and proper staff training and maintenance. A leader with proper knowledge about breastfeeding practices is necessary. Preferably, the leader could be a nurse, a pediatrician or a midwife. The leader will be in charge of all activities in in the milk bank and will work as an advocator for breastfeeding. The leader must also be in charge of information sharing with HMB staff in regards to updated knowledge from other HMBs and clinical information/knowledge about the use of donor milk.

Qualified staff is also required in developing and running a HMB (PATH, 2013). Qualified staff will consist of the leader and other health professionals. It is preferable that the team includes a range of skills that include microbiology, nutrition and lactation, medical support (such as pediatricians and infection experts) and administration skills.

To establish a base, a proper location is a necessity (PATH, 2013). Inside a HMB facility, there should be rooms for donors to express and breastfeed, as well as sufficient space for pasteurization, testing and storage of donor milk. It should be considered that the facility is placed in close by the NICU for easy transportation, and that it is accessible for current- and potentially new donors. The facilities should also have room for counselling and storage of documentation and records.

When establishing a HMB proper equipment is important (PATH, 2013). Different HMB's have different needs dependent on the capacity of the facility and their method of treating donor milk. However, all milk banks will need equipment for milk expression such as breast pumps and containers for storage. Equipment for processing, screening and treatment which includes pasteurizers and others tools for milk handling. If the HMB needs equipment for microbiologic screening depends on if the bacterial testing is happening at the HMB facility, or if the HMB is connected to a laboratory, but in any case screening equipment and protocols have to be in place. HMB's also needs cleaning equipment as well as strict hygienic protocols to prevent contamination or mishandling. Storage equipment such as freezers and refrigerators are also needed. The storage equipment must include temperature control and have the capacity to store treated and un-treated milk separately. It also requires administrative equipment when opening a HMB. This is for monitoring purposes and storage of data.

2.4.8. Awareness and advocacy

The main goal for HMBs in regards to awareness and advocacy is to protect, promote and support breastfeeding for mothers and their infants (PATH, 2013). By promoting breastfeeding and lactation practices, HMB's can serve as a community breastfeeding program and educate mothers in infant feeding practices and achieve good health for both infants and their mothers. Advocating for the HMB by promoting the importance of exclusive breastfeeding from birth, may have an influence on breastfeeding practices and increase the number of potential donors to the HMB. It is also important to inform donors that their participation will not harm their own infant and it will not decrease their milk supply.

There are several methods that can be used to recruit large numbers of donors though promoting the HMB (PATH, 2013). Promotion can go through media such as TV-commercials and internet, sharing information in the maternal ward at the hospital or use local celebrities as advocates. Current or previous donors also seem to be a good recruitment tool as they talk about their experiences with people they know and in that way help to promote the HMB.

2.4.9. Create a network

Establishing networks between different HMBs can contribute in improving newborn care and support strategies (DeMarchis, Israel-Ballard, Mansen & Engmann, 2016). This is because when different HMBs shares information with each other, they contribute in creating better practices and transparency in documentation of successful procedures which again can lead to improved practices on both national and international level. Another important aspect of creating networks is for the HMB to have good relations and partnership with the government and local stakeholders and agencies. This can help raise awareness about the HMB to the public and expand milk banking on a national basis. In addition, the government and local agencies can be useful for financial aspects and give the HMB possibilities for improvement. A third aspect in networking is that the HMB have good relations with their donor mothers. They should aspire to making the donation experience positive and non-stressful so that donor mothers share positive messages about the HMB.

2.4.10. Develop Key protocols

Key protocols involve that local and national guidelines are in up to date according to infant and young child nutrition and newborn care guidelines (DeMarchis et al., 2016; PATH, 2013). The HMB guidelines should aim at the highest attainable standard in local context for best possible practices. If national guidelines are not available in a country, the HMB must work as an independent network or body and self-regulate. There must be protocols in place to keep records of all activities and procedures in the HMB, and systems for tracking donor milk to receiver and back to donor.

It is necessary that HMB's have a well-established system for hazard analysis and critical control points (HACCP) (DeMarchis et al., 2016; PATH, 2013). This is to avoid contamination or mishandling and works as a strict action plan for handling donor milk. By creating a list of checkpoints, with a step-by-step description of procedures, future problems can be avoided. In addition, each HMB must develop guidelines for all procedures and

activities to achieve best possible standard of practices. Also, it is required that al HMB's have a system in place for internal auditing. This is for documentation purposes, and all activities should be reported and logged.

3.0. Methods and Process

The purpose of this chapter is to describe and outline the methods used to gather data and information at The Da Nang Hospital for Women and Children used in this thesis with the purpose to answer the research questions listed earlier. First, the descriptive data used in this study will be presented followed by a presentation of the qualitative data.

3.1. Descriptive data

Descriptive data was collected from the HMB in Da Nang Women's and Children's Hospital by A&T and PATH through a monitoring system developed by A&T. The purpose of the monitoring system is to provide routine data to optimize the functionality of the HMB, and to ensure that all activities meet standardized protocols. Donor mothers receive an individual code for identification that is being used throughout the donor process for traceability of the milk from donor to recipient, and recipient to donor. The HMB registers and documents how much milk that is received from each donor, how many new donors that are being screened and recruited, how many births (both vaginal and cesarean) there are at the hospital, how many babies that are full term, preterm or of low birth weight and how much milk is being donated, pasteurized, distributed and disposed.

The descriptive data used in this study was sent to the author by email. Before receiving the actual data, a form that included the indicators written in English of the data set was received (Appendix 1). Later, the data was sent to the author in seven different PDF documents (one for each month from February to August 2017) in Vietnamese. To be sure that the English and the Vietnamese form correlated, the Vietnamese form was translated to English before the numbers were plotted in to the English form. The author then realized that the two forms were not identical, and had to translate thoroughly before the data analysis could start. The English forms were later plotted in to Excel for further processing. All tables used in the present study were made in Excel.

3.2. Qualitative data

Qualitative methods are often used to study personal and sensitive subjects using in-depth interviews, and the research depends on trust between researcher and informant (Tjora, 2010). When using depth interviews, the researcher asks open questions to give the informant a chance to reflect and talk with an open mind about the given subject (Tjora, 2010). Where in survey studies, the questions are set beforehand with standard answering options, depth interviews allow the informant to talk freely and have the ability to move on to new subjects that might be important. Depth interviews are relevant to studies that wish to seek meaning, experience and beliefs. However, the theme of this study is not on a particularly sensitive level, it is important to achieve trust for the answers to be as honest as possible. In this study, a semi structured interview was used because it allowed the researcher to conduct an interview with a flow like a conversation instead of a very strict interview where the informant might feel pressure. In semi structured interviews, the researcher follows an interview guide that's been made beforehand (Appendix 8, 9 & 10). The interview guide contains subjects and questions, but allows the interviewer to speak freely without being obligated to follow the order of the questions and subjects (Thagaard, 2013; Tjora, 2010).

The focus of this study was to find out how people involved experienced the establishment of the HMB, what was challenging, and why they thought mothers in the hospital were willing to donate their breastmilk to the HMB. When using qualitative methods, such as interviews, it is important to understand the informant's experiences about the subject. To do this, the author used direct quotes from the interviews. In addition, the author used her own words to reproduce the findings to communicate mutual key messages that appeared during the data analyses. In addition to interviews, results from observations conducted during field visits to the HMB will be presented. The observations for this study were done to get an impression of how the HMB was run and if they did everything according to procedures and recommendations.

3.2.1. Phenomenological approach

For this thesis, the author wanted to use an approach that was based on describing people's experiences about- and understanding of a given phenomenon. For this purpose the author chose to have a phenomenological approach (Thagaard, 2013). In phenomenological research, it is the informants' perspective of reality that is being investigated, so it is important for the researcher to keep an open mind and focus on the informants experiences. As an overall methodological approach, the author wanted to learn about the informants' everyday

experiences when working at, and with the HMB. The author wanted to experience a phenomenon firsthand, which is best achieved through qualitative methods that seeks depth in someone's experience.

3.2.2. Observations

The author visited the HMB both before and after the opening. The first visit was during the period between October 20th and November 20th 2016, and the second visit was during the period March 20th to April 20th 2017. For the present study, observations were used as a method to collect data about how the HMB is run and how the staff worked with donated milk from expression to delivery for vulnerable infants. By using observations, the researcher has the opportunity to observe behavior without having to ask questions, and might be able to find patterns related to the objectives used for the study (Lund & Haugen, 2006). To use observations as a method for the present study was an initiative that came up during the visit at the HMB from A&T staff, and was not in the original plans for the study.

During the observations the author had a checklist with important key issues such as facilities, procedures, tracking/documentation, donor information and registration, recipient and handling of milk (Appendix 11). The checklist was used as an indicator for what the author wanted to collect, and in addition the author took field notes during the observations. The observations took place at the HMB and the NICU at DNHWC. The author observed HMB staff before, during and after the process of pasteurization, transportation of donor milk from the HMB to the NICU and donor recruitment. During the observation of the pasteurization process the author tried to remain as passive as possible so the HMB staff wouldn't be affected by my presence, and observed from outside of the pasteurization room from a window. During transportation of PDHM from the HMB to the NICU the author followed one of the HMB staff and tried to stay in the background to not disturb. When donor recruitment was observed, the author was in a counselling room with one of the HMB staff, a translator and the potential donor.

3.2.3. Data collection

A&T was contacted early in the planning process of the study. They were positive to me coming to Viet Nam and their offices to do interviews of their staff. They also helped recruiting informants from PATH and hospital staff, and introduced me to the potential informants. When the interviews were conducted, two of the informants did not speak English, so a translator was needed. There was not enough time to find a certified translator,

so a Vietnamese colleague from A&T had to translate the questions and answers during the interviews.

The interviews were conducted in Viet Nam at the Hospital for Women and Children in Da Nang and at the A&T offices in Hanoi. All the interviews were recorded with Olympus VN-741 PC digital Dictaphone that was bought before-hand. This was to avoid missing key messages from the interviews, and at the same time focus on the informants in the interview situation. In addition the author took notes during the interviews. For the interviews, three separate interview guides were used; one for the HMB staff, one for the HMB leader and one for the staff from A&T and PATH. This was to get an impression of both the experience of establishment and the work experience.

3.2.4. Informants

There were a total of eight informants from three different places of work, here described as three different groups. Two of the informants (hospital staff) represented the HMB staff on a daily basis which gave an insight on how the HMB is run, how they experienced the process of staff training and if they had experienced any changes in breastfeeding practices at the hospital since the establishment of the HMB. In addition, these informants had insight to what works in terms of protocols they follow, and first-hand experience of recruiting donor mothers. These informants also worked at the maternity and/or neonatal care unit at the hospital. Four informants were working for A&T and were involved in different aspects of the process of establishment (technical assistant team from development partners). They had much to say about difficulties during the process of establishment in terms of how to get funds, how to prepare staff and how to establish standard operating procedures (SOPs). Two of the informants from A&T worked on communication strategies and their focus was on how to reach out and how to share information about breastfeeding and the human milk bank in the best possible way to hospital staff, potential donor mothers and current donors. One informant worked for PATH, and was also part of the process of establishment, and therefore included in the same group as the staff from A&T. The last informant was the leader of the HMB and represents HMB leadership. All three groups talked about donor recruitment and breastfeeding practices but with somewhat different angles. The author wanted informants from all of these groups to achieve a wider understanding of what it takes to establish and run a HMB, how to get donors and why they choose to donate and what effect the HMB's presence might have on breastfeeding practices and rates at the hospital. To protect the

informants' anonymity no personal information such as age, profession or name will be presented.

The author received oral consent that was recorded prior to each interview.

3.2.5. Interview guide

In qualitative interviews we often use interview guides to structure the interview setting (Thagaard, 2013). An interview guide can be compared to a tree with branches, where the main topics are the trunk and follow-up questions are the branches. The interviewer needs to balance the depth of the interview and at the same time making sure that all the topics are being covered. When using this type of model, the quality of the interview is dependent on the interviewer's knowledge about the topic beforehand.

Because qualitative interviews focus on people's experiences and feelings it was found necessary to use separate interview guides to achieve best possible answers from each informant. Because the informant's professions focused on different aspects of the HMB, three separate interview guides were used. One for HMB staff, one for the HMB leader and one for staff from A&T and PATH. All of the interview guides focused on the establishment of the HMB but had somewhat different questions. The interview guide for the HMB staff focused more on their day-to-day activities in the HMB in terms of if they had experienced any changes in breastfeeding practices at the hospital from before and after the establishment of the HMB, how they went through with donor recruitment and if they gave any advice about breastfeeding at the hospital. For the staff from A&T and PATH, the questions were based of the practical aspects of the HMB; what was difficult in the process of establishment? Why is the HMB important in Viet Nam? In the interview guide used during the interview of the HMB leader there was a combination of all of these questions. All of the informants were asked why they think mothers choose to donate milk to the HMB.

3.2.6. Convenience sample

Because the study is dependent on knowledge about the HMB, convenience sampling was the best choice for this study. A&T was very helpful during this process in regards to recruiting informants. It was planned before hand to interview HMB staff so A&T helped get in contact with them, and also suggested potential informants from A&T and PATH. Since there was a language barrier the informants were preferred to know English. This however was not possible in terms of HMB staff. It was important to use them as informants, but not all of them spoke English. When using convenience sample, the selection is based on potential

informants that are willing and able to participate in the study (Thagaard, 2013). It is called "convenience" because the informants have abilities or knowledge that is relevant for the subject of the study, and the researcher has access to them.

3.2.7. Transcript of interviews

To transcribe means to transform something from one form to another, and in this case it means to transform speech into text (Kvale & Brinkmann, 2015). This is done to get a better overview of the data material and make it more suitable for analysis. In addition, to structure and transcribe the interviews is part of the analysis. In this study, the interviews were first transcribed as detailed as possible to maintain the interviews reliability. This included that 'thinking breaks', pause words such as 'uhm' or 'eehm', laughter and repetitions were noted. Because some of the informants were Vietnamese, and therefore had a unique English accent, the transcribed interviews were later translated to corrected text to keep the informants anonymity. The first three interviews were completed on the same day, and transcribed within a week. The next interview, with the staff member from PATH, were completed a couple of weeks later, and transcribed within the next two weeks. The interviews of A&T staff were conducted within a week and transcribed during the next a month.

3.2.8. Data analysis

When analyzing qualitative data, the process of analysis is not a delineated part, but rather an ongoing process that starts in the beginning of the research, and doesn't end until the article is finished (Thagaard, 2013). When analyzing interviews, the researcher is supposed to interpret the material and put it in a theoretical context while at the same time stay as objective as possible and put his or her own feeling aside (Thagaard, 2013).

After the data was transcribed, the analysis started by removing pause words, thinking breaks and repetitions to get a more fluent text that was easier to read. When this was done, the data material was coded and categorized in Nvivo 11, a software program for qualitative analysis, to reduce the amount of data. The purpose of this was to achieve categories to describe the informant's experiences and feelings about the topic and to get a more compressed amount of data. It was then possible to name the different categories to certain topics of relevance and adapt them to the meaning of the content, and the names were based on quotes from the interviews and the study objectives (Kvale & Brinkmann, 2015). This process is called open coding (Boolsen, 2017). The material was sorted thematically in to three categories: 1) Donor recruitment, 2) Breastfeeding practices and 3) Challenges and difficulties. For each of these

categories tables were made and relevant findings from each interview were put together. This made it easier to achieve an overview of the large amount of data.

4.0. Results

In the first part of this chapter, the descriptive data from the monitoring system will be presented. It will be based on the data received from A&T. Secondly observations from field visits will be presented, followed by findings from the interviews which will be presented thematically/categorically. This is to give a deeper understanding about the different aspects of the establishment of the HMB.

4.1. Description of the monitoring system

4.1.1. Tables and figures

Table 1: Characteristics of the donor mothers from February 2017 to August 2017

Characteristics	**Number**
Mothers participating in donor recruitment	340
Potential donors	135
Final number of donors	115
Mean age, years (SD)	27,9 + 4
Mothers with preterm births, n (%)	64 (56)
Mothers giving birth at the Da Nang hospital for Women and Children, n (%)	97 (84)
Mothers living in Da Nang, n (%)	75 (65)
Mothers from community, n (%)	38 (33)

Table 1 shows the characteristics of the donating mothers after operating the HMB for seven months. The mean (SD) age of the donating mothers were 27.9 (4), and 56 % of the mothers had preterm infants.

Table 2: General information about deliveries.

General information	**February** n (%)	**March** n (%)	**April** n (%)	**May** n (%)	**June** n (%)	**July** n (%)	**August** n (%)
No. Of live births from vaginal deliveries	496	557	623	526	560	560	
No. Of live birth from cesarean deliveries	557	680	611	729	653	635	
No. Of low birth weight (< 2500 g)	78 (7,4)	102 (8,2)	125 (10,1)	94 (7,4)	114 (9,4)	114 (9,5)	
No. Of premature infants (< 37 weeks)	97 (9,2)	113 (9,1)	130 (10,5)	110 (8,7)	107 (8,8)	107 (8,9)	
No. of new patients to the Neonatal Care	382	518	501	529	490	548	
No. Of infants with mothers with HIV/AIDS	0	1 (0,08)	3 (0,2)	1 (0,08)	1 (0,08)	1 (0,08)	
No. Of orphaned and abandoned infants	1 (0,09)	1 (0,08)	0	1 (0,08)	2 (0,1)	0	
No. of children currently using milk from the HMB	11	100	161	237	215	241	299

Table 2 shows general information about deliveries. There was a total of 7187 births from February to July, with 3322 (46, 2 %) births from vaginal deliveries, and 3865 (53,7 %) births from cesarean deliveries. During the same period, 627 (8 %) of the infants were born with low birth weight and 664 (9 %) were premature. A total of five infants were orphaned or abandoned.

Figure 1: Number of children who started receiving PDHM from the HMB

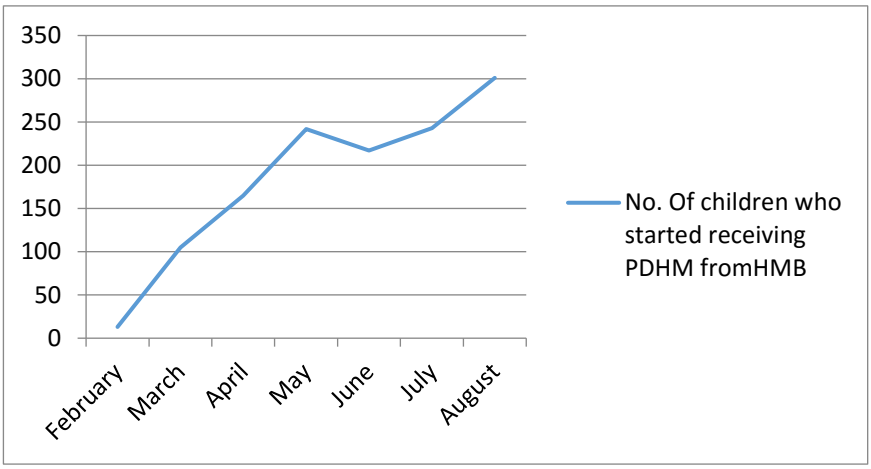

Figure 1 shows the number of children who started receiving PDHM from the HMB each month over the seven-month period. It is a continual increase in the amount of infants receiving PDHM from the HMB, where in February 13 children started receiving PDHM from the HMB, and in August 301 children started receiving PDHM from the HMB. It shows that the largest increase was from February (13 infants) to March (105 infants). It continued to increase to May (242 infant), but dropped in June (217 infants) before it increased again in July (243 infants) and August (301 infants).

Table 3: Donor recruitment and screening

Recruiting, screening and managing of donors	**February n (%)**	**March n (%)**	**April n (%)**	**May n (%)**	**June n (%)**	**July n (%)**	**August n (%)**
No. of lactating mothers who attended donor recruitment (Total)	**41**	**80**	**63**	**60**	**41**	**17**	**38**
No. of group counselling sessions for demand generation (<10 mothers)	5	4	8	7	1	1	0
No. of demand generation events (>10 mothers)	0	3	0	0	0	0	0
No. of mothers from one-on-one recruitment	16 (39,0)	35 (43,7)	13 (20,6)	26 (43,3)	31 (75,6)	11 (64,7)	38 (100)
No. of mothers from group recruitment	25 (61,0)	45 (56,2)	50 (79,3)	34 (56,6)	3 (7,3)	6 (35,2)	0
No. of mothers from event recruitment	0	0	0	0	7 (17,0)	0	0
No. of donor mothers who expressed interest in donating after recruitment	19 (46,3)	50 (62,5)	13 (20,6)	24 (40,0)	12 (29,2)	3 (17,6)	14 (36,8)
No. of newly screened donors	7	30	13	17	8	13	20
No. of lactating mothers newly screened and meet all requirements to be eligible to be a human milk donor	16 (39,0)	26 (32,5)	9 (14,2)	19 (31,6)	19 (46,3)	10 (58,8)	14 (36,8)
No. of eligible human milk donors taught proper hygiene and donation skills (e.g., wash hands, safely express milk, store, label, and transport milk to the HMB)	16	27	9	19	19	10	15
No. of mothers who stopped donating milk	7	17	19	17	11	9	2

Information on donor recruitment and screening is presented in table 3. The table shows that during the seven month period 340 potential donors attended donor recruitment and 135 (39 %) of them showed interest of becoming donors after recruitment. In total 115 (34 %) potential donors met all the requirements to become donors. The table shows that the number of lactating mothers who attended donor recruitment decreased during from the March when 81 mothers attended donor recruitment. The lowest number of mothers who attended recruitment was in July when 17 lactating mothers attended donor recruitment. By August, the number of lactating mothers who attended donor recruitment increased to 38. The number of lactating mothers who met all the requirements of actually becoming a HMB donor varied from 9 (April) to 26 (March).

Figure 2: Number of donors through the time period of seven months.

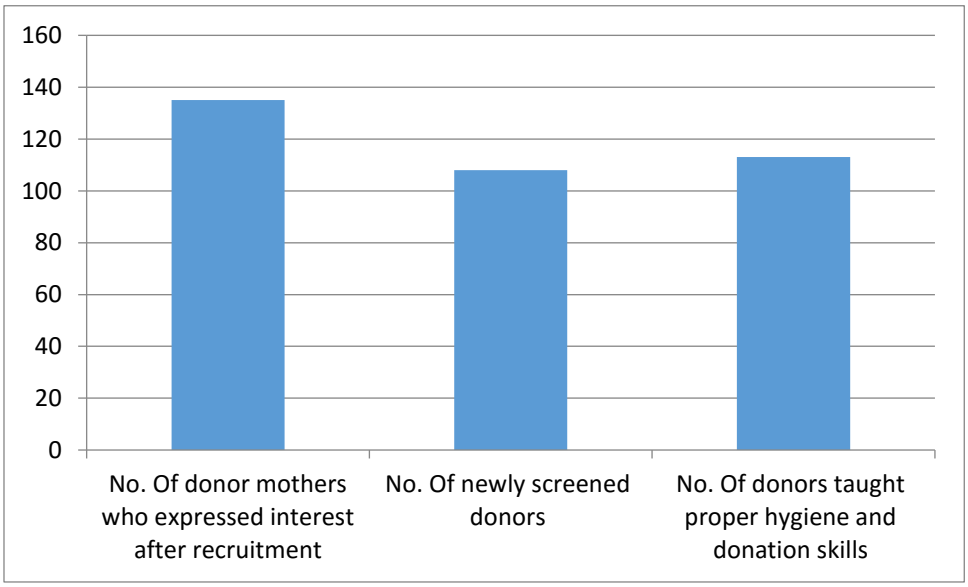

Figure 2 shows the total numbers of donors that were interested in becoming a donor for the HMB after recruitment, how many newly screened donors and how many donors was taught proper skills for hygiene and donation.

Table 4: Donor human milk distributed from the HMB.

Receiving, storage, processing and distribution of donor milk at HMB (Liter)	**February**	**March**	**April**	**May**	**June**	**July**	**August**
Volume of breastmilk donated	45,7	126,5	111,7	150,0	174,2	144,9	124,3
Volume of PDHM	14,2	88,8	122,4	112,6	122,7	137,8	184,0
Volume of PDHM passed both pre- and post-bacterial test	9,7	41,4	104,2	52,8	123,9	112,7	148,0
Amount of disposed PDHM milk	8,1	21,2	28,0	67,4	20,1	25,0	19,4
Volume of distributed PDHM	5,0	26,5	72,1	95,0	85,0	93,3	113,5
Volume of PDHM fed to infants	6,0	48,0	85,1	99,7	76,7	91,4	117,4

Information on donor human milk donated to- and distributed from the HMB is presented in table 4 and Figure 4. During February 45, 7 L donor milk was donated to the HMB and 9, 7 L passed pre and post bacterial testing. 6 L PDHM was fed to infants. These numbers increased considerably during March when 126, 5 L breastmilk was donated to the HMB and 41, 4 L passed pre and post bacterial testing. This increase remained stable during the next months, with variations between 111, 7 L to 174, 2 L. The amount of disposed donor milk varied (% of total amount of donated breast milk); approximately 18 % in February, 17 % in March, 25 % in April, 45 % in May, 12 % in June, 17 % in July and 16 % in August. The total amount of donated breastmilk during the seven month period was 876,9 L and a total of 189,2 L (22 %) was disposed due to different reasons (see figure 3). Volume of PDHM fed to infants increased from February (6, 0 L) to August (117, 4 L), with a decrease in June (76, 7 L) (see figure 3 and 4).

Figure 3: Total amount of donated and disposed donor milk during seven months.

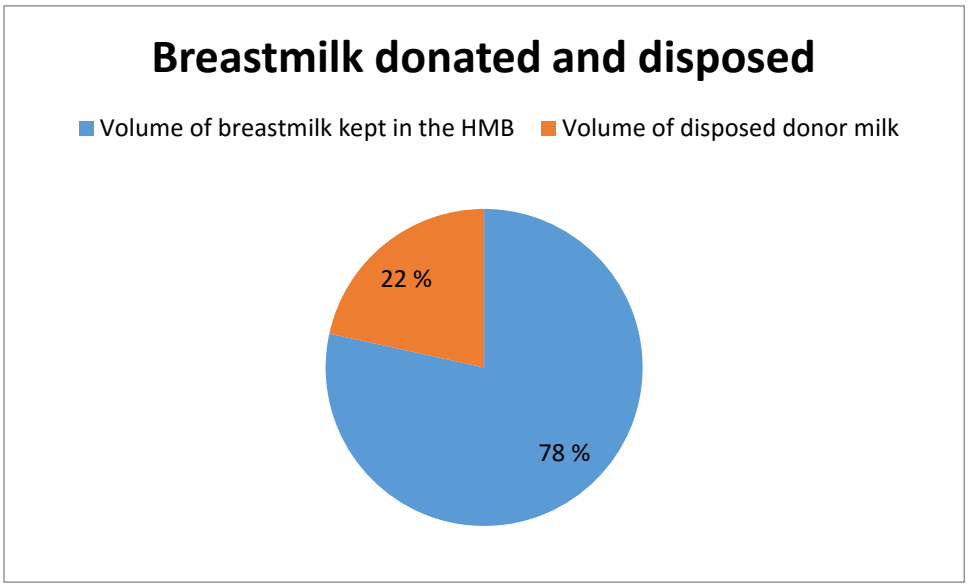

Figure 3 shows the total amount of breastmilk donated to the HMB during the seven month period. The figure shows that 22 % of the total amount of donated breastmilk had to be disposed due to different reasons and 78 % was used for the HMB.

Figure 4: Volume of PDHM fed to infants (L)

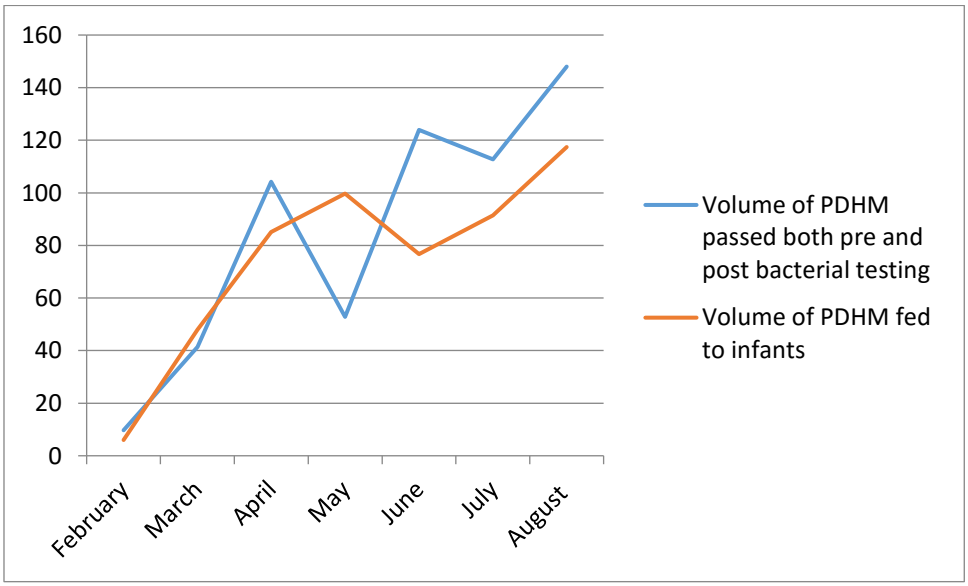

Figure 4 shows the amount of PDHM that passed both pre and post-bacterial testing compared to the amount of PDHM fed to infants each month during the seven month period.

4.2. Observations

4.2.1. Observations from the first visit to the HMB

The first visit to the HMB happened during the time period October 20th to November 20th 2016. The HMB facilities were located at the first floor and were easily accessible from the main entrance of the hospital. The first room of the HMB was for counselling and milk expression with direct access from the hospital corridor. It was equipped with a table for counselling, a desk, a TV, cabinets for storage and three cubicles for milk expression. The second room was for storage, with shelves and cabinets. The third room was for pasteurization. This room was equipped with a working bench of stainless steel, a tap and sink, and easy access to the outside corridor though an opening under the work bench (window/door) for delivering/collecting disposables without having to leave the HMB. It was access to the storage room through a hatch in the wall. The pasteurizer had just arrived, but it was not set in place. The room was also missing freezers and refrigerators. The last room was for cleaning purposes. It was equipped with a work bench, a sink and a decontaminator. There was also access to the storage room through a hatch in the wall. The rooms were connected by a corridor in between.

During this first visit to the HMB, the author also got a tour of the neonatal care ward. It was a lot of focus on kangaroo mother care (KMC), with several rooms for this purpose. This unit already had a system in place for mothers to express and store breast milk, for personal use, in refrigerators and freezers.

4.2.2. Observations from the second visit to the HMB

On the second visit to the HMB, in March 2017, the facilities had opened and the author was able to observe all of the procedures. It is important to mention that initially, before the HMB was opened, it was not part of the plan that mothers were supposed to express and donate milk from home. However, this was now being practiced, and staff from the HMB went to donor homes to inspect if they had suitable conditions for storage and milk expression. The checklist for this process was still being developed, and was therefore not available.

Pasteurization

The first procedure observed was the process of pasteurizing milk. There were two staff members from the HMB in the pasteurization room, both equipped with hair net, shoes, gloves, and contamination coats on top of their usual uniforms. Handwashing was performed continuously throughout the procedure.

First, they took a batch of small glass containers with raw mother's milk (unpasteurized) mothers milk out of the refrigerator. One of the staff members gently shook the bottles and took the lids off, while the other staff member poured the milk out of the containers and in to a steel casserole through a strainer. After all the containers had been poured, one of the staff members stirred the milk gently with a steel whisk. The empty containers were put in a basket under the work bench, where a hatch led out to the corridor for easy pick-up to avoid contamination in the pasteurization room. After the milk had been stirred, they took a small container and filled it with milk for bacterial testing (pre pasteurization-test). Then they poured the milk from the casserole in to sterilized glass bottles (200 ml milk in each bottle). Then they put caps on all of the bottles and labelled them. An empty bottle was filled with water before all the bottles were put in to a steel basket and placed in the pasteurizer. For temperature control, they put a thermometer in the bottle of water.

After pasteurization

First, the water bottle was taken out of the batch and the temperature was logged. A random bottle of milk was then opened, and a small portion of milk was poured in to a small container for bacterial testing (post pasteurization-test). There were now two small containers for bacterial testing (pre, and post pasteurization). They both got labeled and sent to the lab for analysis. The milk bottles from the pasteurizer were dried off with a cloth, and immediately put in the freezer and logged (Appendix 5 & 6).

Delivery of milk from HMB to neonatal care unit

First, a cooling bag used for transportation was cleaned with an antibacterial sanitizer outside the pasteurization room. The cooler bag was then moved in to the pasteurization room. Bottles of milk were taken out of the freezer, and got date labeled on the lid and body of the bottle before they were put in the cooling bag and placed on a hatch in the wall, leading to the hallway. The nurse then left the pasteurization room, and picket up the cooling bag from the other side of the hatch in the hallway. The nurse carried the cooling bag to the milk kitchen in the neonatal care unit, and the bottles were put in a freezer in the milk kitchen. She then documented the date of delivery and the amount of milk in a folder. Another nurse came in to the kitchen and double checked the documentation and that it was correct, and picket up a consent form for the receiver (Appendix 7). After the documentation, the nurse from the HMB picked up empty bottles from the milk kitchen and brought them back to the

decontaminator in the HMB. The author did not get to observe milk being fed to infants on the neonatal ward.

Screening of potential donor mother

The author, a staff member from A&T and a staff member from the HMB, met a potential donor mother at the neonatal ward at the hospital. The HMB had heard of her beforehand from the neonatal ward. She was producing a large amount of milk and had to throw away a lot. Her own baby was preterm and had a birth weight at 2500 g. The staff member told the mother about the HMB, and that it could be a good alternative for her to avoid having to dispose her milk, and still maintain a good milk production for her own baby's future need. The staff member then asked the mother about her name, ethnicity, address, phone number and her child's name. The mother had given birth at another hospital, but was now admitted to the neonatal ward at the Women and children's Hospital in Da Nang. The staff member followed a donor screening form (Appendix 2), and asked her if she had heard about the HMB, and if so how, and the mother said she had heard about if from nurses and mothers at the neonatal ward.

The staff member then continued by asking the mother about her health in regard to make sure her breastmilk was safe. She asked about her medical history, and if she had any diseases such as hepatitis A, B, or C, HIV/AIDS or other. She then asked about her use of medication and if she had any tattoos or piercings. The staff member moved on to questions about milk expression and hygiene. She asked the mother what type of pumping equipment she used and if any, which. The staff member continued by asking her how she cleaned her equipment, her hands and breasts before and after pumping. She then explained how to correctly wash the equipment and gave the mother positive feedback for her methods.

After they had completed donor screening, the mother signed a consent form (Appendix 3). We then walked to the HMB facilities and the staff member asked the mother some additional questions in the counselling room in the HMB before filling out a registration form (Appendix 4). The staff member made an ID-code for the mother, and gave her and ID-card. Then, the staff member showed the mother two separate videos. The first video was promoting the HMB and simply demonstrated how and why the HMB operates. The second video was more of an instructional video, that explained and demonstrated how to express milk, how to clean equipment, how to store milk and how to keep the equipment clean. The second video also demonstrated hygienic measures and how to clean her hands and breasts before expressing.

After the second video, the staff member demonstrated to the mother how to wash her hands correctly. After this demonstration the staff member showed the mother how to massage her breast. They did this behind a closed curtain so the author did not observe this process.

4.3. Interviews

4.3.1. Donor recruitment

All of the informants believed that the best way of recruiting donors was through the Neonatal Care Unit by approaching mothers who were admitted with their infants. This had to do with having access to lactating mothers, and a unique way of reaching out to them. It also gave an opportunity to educate the potential donors about the HMB and breastfeeding practices in a safe way and being able to oversee their ability to understand the given information and put it to use. This might be because mothers from the neonatal ward have longer hospital stays than mothers in the maternity unit, which gives the hospital staff more time with the mothers. When the informants were asked why they think mothers choose to donate there was a clear consensus; a lot of the current donor mothers were mothers of premature infants that had previously received milk from the HMB. The author has chosen to present this quote by one of the informants from the hospital staff that describes her experience of the milk donor's feelings about donating to the HMB:

> *"At first they are recipients of the human milk bank, but later on after they've had surgery or when they have better breastmilk supply they donate it to the human milk bank, so they serve two roles. From what I discussed with women when I was in the hospital, I realized that a lot of them play both roles; donor and recipient, but they receive it first."*

In addition to the donors recruited through the neonatal care, other channels for recruitment were also mentioned. This included sharing information about the HMB to mothers at pre-natal checkup, through communication channels such as internet and TV and through relations with other people. Some of the informants gave the impression that those channels were especially helpful during the commencement of the HMB to recruit the first donors.

> *"For example, the IT-guy who supports the human milk bank also knows a lot of people so he informed people about the human milk bank and so actually we got some of the donors through him."*

Initially, donor mothers were not supposed to donate their milk from home. This however became difficult when recruiting donors from the communities. The HMB staff found it necessary to change their practices, and initiated that donor mothers could donate from home.

> *"So initially the hospital wasn't really planning for that, but then, because the demand of the donors* [that] *want to donate, and also the demand of the human milk bank for the milk, we opened for this channel."*

There were also a lot of communication strategies set in place for recruiting donors in addition to promote the HMB. Logos, posters, leaflets, web pages amongst other things were created to reach out to the communities. Two of the informants called this behavioral change communication. Since this was the first HMB in Viet Nam it was important to create a model that could be transferred throughout the county.

> *"[…] And the role of the other breastfeeding activities in supporting breastfeeding practices and expressing breastmilk practices among women, and so what is the barriers that make women hesitant to share or to receive breastmilk? All that kind of stuff we found from the formative research and we transformed it in to the materials* [to] *address the concerns from* [the] *audience […]"*

Another overall experience that seemed to be quite clear was milk sharing in the community. Several of the informants mentioned that there was already being done quite a lot of milk sharing between mothers in the community that did not take the risk of contamination in to account. It appeared that mothers who were struggling with their own milk production asked other lactating mothers if they would share their milk, or that mothers with a lot of milk offered to share. This also appeared to be a problem when recruiting donors.

> *"Before the first human milk bank in Viet Nam, they had some activity for sharing milk in the community. They didn't care much about the contamination or transmission of infectious diseases so they did it willingly. The mothers are very generous, but to put them in a commitment and follow the 'good rules' is difficult at the beginning, because for them to give milk to the human milk bank they need to follow certain guidelines. So every day they need to have good hand hygiene and follow good practices of breastmilk expression, storage of the milk and even at home they need to clean the equipment well. So these are some of the difficulties to make people follow guidelines"*

4.3.2. Breastfeeding practices

Originally the study wanted to investigate if breastfeeding rates at the hospital had changed after the opening of the HMB. This was however early to say because the interviews were conducted during the first month after the official opening. Despite breastfeeding rates, the informants had an overall positive experience about eventual positive changes in breastfeeding practices at the hospital that they connected to the HMB. When asked about breastfeeding and if the HMB might contribute to a change in breastfeeding practices at the hospital, the informants from the hospital staff were particularly positive, and amongst other things they mentioned that the HMB may have helped to make a change in breastfeeding promotion and awareness.

> *"[…] the presence of the human milk bank might have an effect on people. The importance of breastfeeding and the importance of promoting to mothers to protect their milk for their own children […]. We think that the knowledge of breastfeeding has risen among our mothers here."*

She later added that it is too early to say for sure what type of impact the HMB might have on breastfeeding practices, but it appears to be positive. One of the hospital staff members had also noticed a change in the way she approached women after they had given birth. She explained that before she started to work at the HMB, she only assisted mothers to support skin-to-skin mother care and EENC, and now she also did counseling services on breastfeeding in both the delivery room and the post-natal ward:

> *"[…] in the past I worked in the delivery unit, and there I only helped the mother to support the skin-to-skin and EENC. So when I am* [now] *working part time in the human milk bank I provide consular services, not only in the delivery room, but also at the post-natal ward. So now I also give a lot of information about breastfeeding during the time I go through the screening of the donors, and people* [also] *call to the human milk bank and I answer and I help them with advice."*

Communication about breastfeeding seemed to be an important part of the HMB, and it was mentioned by seven of the eight informants. There were a lot of focus on how to communicate about breastfeeding in the best possible way to both mothers and hospital staff. The informants from A&T had a lot of experience from this field from working with advocacy for the HMB, and two of them worked exclusively on communications strategies. It was mentioned that when communicating about the HMB there were a lot of focus on the benefits

of breastfeeding and highlighting that mothers own milk is always the best choice of nutrition for infants and donor milk comes as an alternative if mothers own milk is not available.

All of the informants said that all of the donors breastfeed their own children exclusively.

4.3.3. Challenges and difficulties during the establishment

Because this was the first human milk bank in Viet Nam, and therefore no national guidelines beforehand on how to establish and run a human milk bank the author found it interesting to know what the informants experienced as challenges and/or difficulties during the process of establishment. Also, the opening of the HMB was postponed several times, and therefore it was interesting to know if the challenges may have contributed to the delay. When the informants were asked what they considered to be challenges/difficulties, the answers varied a lot. Each of the informants had experienced different challenges and had different opinions to what they were based on their responsibilities. One of the informants from the hospital staff meant that the greatest challenge was to get funds for equipment and to build the facilities, while the informant from PATH and one informant from A&T meant that the biggest challenge was the cooperation between different stakeholders, partners and organizations.

> *"So I think that one of the biggest challenges in the beginning was in part because we had different scopes of work, different timelines, different projects* [and] *different funders with their own demands and everyone wanting to do the right thing but with different ideas of how that is done […]"*

A mutual challenge that was described by both hospital staff and staff from A&T was the workload that was put on the nurses at the hospital, and the need for more staff. One of the staff members from A&T said:

> *"[…] Now we have two official staff working for* [the] *human milk bank that* [has an] *overload* [of work]*, but if they want more personnel it's quite complicated. Contracting and issues from the department of health […] because the staff are picked by the government, by the DOH* [Department of Health] *and they have the limited headcount for hospitals. For example if they need more personnel and the state budget has no line for that then it cannot happen. And if* [the] *hospital want to have more people- more staff for the human milk bank, they can sign a contract and they pay the staff as the label contract* [and] *not from the state budget, but you know the thing is*

that the hospital doesn't have the budget for that, even the human milk bank now we don't have any extra money, so how [can] *the hospital pay for additional staff?"*

One of the informants from the hospital staff stated that the workload put on the already existing staff is overwhelming and described it as a burden:

"[…] And then to provide milk to the babies that need donor milk, like the majority happen in the neonatal unit and the staff here is very busy already, they are very busy, and now the job to record all the information on the babies and of the donor milk, we need to track all the information there is, and that is the burden and now the burden of workload to our staff."

Other difficulties relating HMB staff was the training required to recruit new staff members. One informant from the hospital staff said that the staff training was one challenge, but another was to come up with good solutions on how to do things in general; how to recruit donors, how to get enough milk for the milk bank and how to operate the HMB in the best possible way.

"[…] we need to read a lot, self-training and during the time of the process [of establishment] *of* [the] *human milk bank, our staff needed to, you know, find good ways to overcome some challenges."*

5.0. Discussion

The first part of this chapter will discuss the researchers' role in the study, sampling of informants and the implementation of interviews and data analysis. At the end of this chapter the results will be discussed and compared to relevant literature on the subject.

5.1. Researchers role

It is important for the researcher to have a close connection to the study field and to be aware of – and account for the effect his or her presence may have on the results (Hovland et al., 2009). In qualitative studies, the researcher is often closer to the subjects compared to studies using questionnaires and statistical analysis (Hovland et al., 2009). Normally, the researcher should have knowledge about the theme of the study before conducting interviews to have a better understanding of findings.

The author of the present study was an "outsider" to the field during data collection. Considering that the author was visiting Viet Nam as an exchange student, the role of

researcher might be interpreted as inferior to the informants due to lack of knowledge about the Vietnamese practices for human milk banking. The author had read a lot about human milk banking in general before-hand, and visited a HMB in Norway to gather as much knowledge as possible. It was however limited amounts literature available in English regarding the HMB in Viet Nam, and the practices used in Norwegian HMBs is very different from Vietnamese practices. Although the author learned a lot during field trips, the informants had more knowledge about the subject than the author.

5.2. Methodological considerations

5.2.1. Collection of descriptive data

The descriptive data collected by A&T was sent to the author by e-mail in Vietnamese, which might have caused error in the data set because the author had to translate it before plotting the numbers in to the English form. However, the data was carefully verified by the author. In addition, the author found an error in the data set that was traced back to the software program for monitoring and this caused some data to be removed. It appeared that the error happened when the HMB recruited donors from outside the hospital, but the software program is under development to find better ways to document and reflect this subject.

5.2.2. Convenience sampling and participants

Data retrieved from qualitative interviews cannot be generalized to the whole population, but can give important information about a group of people inside a given population (Thagaard, 2013). E.g. the findings from the interviews used in the present study can tell us about the informant's experience and perception about the HMB, but it cannot tell us if additional hospital staff from DNHWC had the same experiences. In addition, only three staff members of the HMB were interviewed so the findings might be narrow due to small sample size. Since the method for recruitment was convenience sampling and participants were chosen because of their knowledge of the HMB, there is always a risk of systematic bias, or in this case selection bias since the informants had extensive knowledge of the HMB. It could have been interesting to also interview donor mothers to get a wider understanding on common knowledge about the HMB, and especially about why mothers chose to donate their breastmilk to the HMB. It might have given a broader understanding on how the experience of donating milk really is, and if they had other key experiences that the professional informants didn't know about. However, this was not possible due to language barriers and lack of ethical approval from health authorities in Viet Nam.

5.2.3. Interview bias

When interviews is used as a method, interview bias is always a potential weakness (Kvale & Brinkmann, 2015). There is a chance that the data might be affected by the interviewers' characteristics, and it is a risk that the interviewer influences responses from informants. In addition, there is also a risk that if there are more than one interviewer, the formulation of questions may vary between different interviewers. During the present study the interviewer used interview guides in English for all of the informants, and additionally only one interviewer conducted the interviews. However, two members from the HMB staff did not speak English, so a translator was used, which might have changed the formulation of the questions. Also, the interviewer found it difficult to ask follow-up questions and communicate directly with the informants. This made it difficult to achieve optimal contact with the informants and might have led to limited information. Without the language barrier, there might have been more meaningful and deeper findings from the interviews which would have made the results more valuable. It is also important to mention that the author knew the staff from A&T before the interviews which also can contribute to interview bias. This might have created a different environment during the interviews compared to the other two groups where there was no personal connection. In addition, the informants from A&T were aware of the study objectives from the present study, and one of them even helped structure the interview guide before-hand.

In-depth interviews were chosen because the informants were expected to have knowledge about the HMB beforehand. Another thing that might have had an impact on the quality of the results is that the first three interviews were completed very spontaneously and therefore the planning happened very quickly. Also, one of the interviews happened on the same day as the informant was asked to participate because the informant was leaving Viet Nam the next day. There was a lot happening this day, and the interview had to be conducted in a somewhat stressful setting.

5.2.4. Transcribing and data analysis

When transcribing the interviews there were some challenges. One thing that really stood out as a difficulty was to understand the English spoken with a Vietnamese accent. There were a lot of confusion towards what they said, especially when listening to the recordings, and it was a time consuming process. The author had to listen to the recordings several times and in slow motion to understand what was said. The solution to this was to listen to whole sentences and put what they said in to context instead of trying to understand it word by word. However, when a whole sentence wasn't understandable, it was not used as a source of data. Another challenge was the amount of time it took to transcribe each interview and sort them in to categories. When all the interviews were transcribed, it was a large amount of data which was frustrating to work with and difficult to keep track of. It took a lot of time to thematically categorize the data, and it was sometimes difficult to keep a silver lining in presenting the results. When the data was sorted in different tables, it became easier to systemize findings and to see "the whole picture". The author had to read through the transcripts several times and every time new findings emerged that had been previously overlooked.

5.3. Discussion of Results

One of the main findings from the descriptive results were that 56 % of the donor mothers were mothers of preterm infants. There was an increase in the number of infants who started receiving PDHM from the HMB (13 in February and 301 in August), and an equally increasing amount of PDHM fed to infants. A third main finding from the descriptive data was the amount of disposed donor milk. It was a continuous increase from February (8 L, 18%) to May (67 L, 45 %), before it decreased to (20 L) 12 % in June. Main findings from the observations were the changes in practices from the first to the second visit, where donor mothers were able to donate milk from home during the second visit. The interviews showed that there were various reasons for donors to donate their milk. The most common reason was a wish to give back because they previously had received PDHM. Another main finding was challenges that occurred during the establishment, which included how to get funding, how to cooperate between different organizations and stakeholders involved and how to get additional staff working for the HMB.

Worldwide there has not been published many studies about the establishment of human milk banks, though there are recommendations (DeMarchis et al., 2016; PATH, 2013). However, a study by Chang, Cheng, Wu og Fang (2013) investigated characteristics of the first HMB in Taiwan from their opening in 2005 to 2010 that had some relevant findings related to the

present study. The present study found that 340 lactating mothers attended donor recruitment, and 115 (34 %) became donors at the HMB. Chang et al. (2013) found that during a six year period, 917 lactating mothers attended donor recruitment, and 816 qualified to become donors (89 %). The present study found that during the period of seven months the number of infants who started receiving PDHM increased from 13 in February to 301 infants in August. Chang et al. (2013) found that during their six year period, the number of infants who received donor milk increased each year. The author is under the impression that this shows a need for more donors and HMB's in Viet Nam. Although the time period used in the study by Chang et al. (2013) is different from the present study, their findings could be comparable to the findings from Viet Nam because of similar indicators such as number of donors recruited, amount of donated breast milk and the amount of PDHM fed to infants.

In South Australia, a study on breastfeeding mothers and mothers of premature or sick infants was conducted to see if they have heard of, or thought there was a need for a HMB (Mackenzie, Javanparast & Newman, 2013). In addition to interviewing 12 mothers, they had two focus groups; the first group included breastfeeding mothers with potential of becoming milk bank donors and the second group was mothers of sick and preterm infants (mothers of potential receivers). This study might not give a good impression on donor recruitment or breastfeeding practices directly because the informants weren't donors. However, it might have interesting findings in regards to what potential donors would think about donating, or not donating their breastmilk to a HMB. They found that one of the mothers had offered her milk to the hospital when she was admitted because she produced such large amounts, but the hospital couldn't accept it (Mackenzie et al., 2013). They also found that all the mothers who participated in the study supported establishing a HMB because they knew donor milk would be in the best interest for infants that didn't have access to own mothers milk. Another qualitative study, by Miranda, Passos, Freitas og Bonolo (2016) wanted to understand donor mothers' experience of donating their breast milk to a HMB. The purpose of their study was to raise awareness to- and contribute in making new strategies for reaching new potential donors. This might be relevant to findings about donor recruitment and challenges found in the present study in regards to recruiting donors from outside the hospital. Another study from Brazil aimed to investigate factors that motivated and influenced women to donate breastmilk to a HMB in Alagoas, which is also relevant to findings on why mothers choose to donate from the present study (Pimenteira Thomaz et al., 2008).

5.3.1. Characteristics of the donors and the HMB

Data shows that 56 % of all donor mothers were mothers of preterm babies. This might have something to do with donor recruitment from the hospital and their ability to donate milk directly from the hospital. It is also possible that the mothers of premature infants have better knowledge about the importance of the HMB because they have received PDHM for their own infants before they became donors and want to "give back", as mentioned during the interviews. A study from the establishment of the first HMB in Taiwan showed that 8 % of their donor mothers were mothers of premature infants, and 91 % of the donors delivered at term (Chang et al., 2013). Even though this was during a five year period, it shows that recruiting mothers of full term infants might be a good solution because most mothers, or potential donors, will be in this group. It might be interesting to see if further research about donor recruitment will focus more on full term mothers. In addition, the author is under the impression that this might be very interesting for the HMB in Viet Nam. According to numbers presented in the present study there might be a need to focus more on donor mothers outside the hospital. Since the HMB have changed their procedures for milk donation and donors are able to donate from home this might be highly relevant in the future.

Data presented in the present study found a clear increase in infants who receive donor milk during the first seven months after opening. In February, 13 infants started receiving donor milk from the HMB, and in August 301 infants started receiving donor milk, which is a 2215 % increase. That might tell us something about the need for HMBs and donor milk for vulnerable infants. In the future it might be interesting to see if these numbers continue to increase further. Chang et al. (2013) found that during the time period from the opening in January 2005 to December 2010 the number of infants who received donor milk from the HMB increased each year. The same study found that the amount of donor milk from the HMB also increased each year. This shows some resemblance to the data from the present study where six liters PDHM was fed to infants in February, and 117, 4 liters in August. This shows an 1856, 6 % increase of PDHM fed to infants.

The number of donors recruited during the seven month period did not increase consistently. The highest number of mothers attending donor recruitment was in March, with 80 lactating mothers. This was approximately a 50 % increase from February, where 41 lactating mothers attended donor recruitment. After March however, the number of potential donor mothers dropped to 63 in April, and continued to decrease until July where only 17 lactating mothers attended donor recruitment. This is approximately a 79 % decrease from March. It did

increase from July to August, where 38 lactating mothers attended donor recruitment. It would be interesting to investigate why these numbers seemed to decrease almost continuously and why they didn't seem to correlate with the number of group counselling sessions. In March, when 80 lactating mothers attended donor recruitment, there were a number of four group counselling sessions, and in February where 41 mothers attended recruitment there were five group counselling sessions. In July, when 17 lactating mothers attended donor recruitment, there was only one counselling session. This could have been an explanation for the decrease, but in June there was also one counselling session, and in August there were none, and the number of mothers who attended donor recruitment were 41 and 38. It was however interesting to look at the amount of donors that was actually recruited after recruitment and screening. In March, 26 (13 %) of the 80 lactating mothers who attended donor recruitment became donors, and in July 10 (56 %) new donors were recruited, which is the highest percentage during the whole period. In April only 9 (14 %) of the 63 potential donor mothers became donors.

5.3.2. Observations

During the first field visit the HMB was still under establishment. The team was working on the facilities in accordance with the recommendations regarding having a solid base (DeMarchis et al., 2016). They had recruited a leader and competent staff which had gone through staff training, but the facilities was still under development, and equipment was still needed.

From the first to the second visit, some changes in the routines at the HMB were observed. The author wondered whether the cubicles for milk expression (in the counselling room) allowed enough privacy when potential donors were being interviewed while at the same time someone was using the cubicles for milk expression. Since there were no guidelines available in English for establishing a HMB in Viet Nam, the author wondered why donors were not expressing milk from home. Especially since guidelines for establishing and running HMB's in other countries uses home expression (Arslanoglu et al., 2010; Hartmann et al., 2007). In addition, recommendations suggest that donating breastmilk should be a non-stressful and positive experience (DeMarchis et al., 2016). With that in mind, donating from home might create a more comfortable atmosphere compared to donating from the hospital or HMB. However, during the second visit to the HMB, they had changed their practices, and donor mothers were able to donate from home. During the interviews, it was mentioned that it was necessary to include a procedure due to donor recruitment from communities. It might be

inconvenient for donors who do not stay at the hospital to transport and deliver their milk, or to travel to the HMB for milk expression, so it was described as a "demand from donors". This procedure included that a staff member from the HMB went do the potential donors house to assess if their home were good enough for HMB standards for storage. This also correlates with what DeMarchis et al. (2016) mentioned when talking about donors. The HMB should take donors' needs in to account to create positive experiences amongst donors.

In the neonatal intensive care unit (NICU), where there were refrigerators and freezers for milk storage, the author noticed some of the milk was stored in plastic bags. This might not be preferable due to the polyethylene in plastic bags that contribute to reduce the amount of lysozyme and antibodies against E.coli in the milk. It is also hard to blend/stir the milk when it is stored in plastic bags and part of fat from the milk might remain in the bag (Helsetilsynet, 2002; Lawrence, 1999). During the second visit, they did not use plastic bags for storage. This might have something to do with the HMB opening and changes in practices for milk storage in terms with general recommendations for the HMB (PATH, 2013).

5.3.3. Why mothers choose to donate their breastmilk

It is important to mention that this study did not interview donor mothers. All the reasons expressed for mothers to donate came from professionals that had been in contact with them. By working at the hospital, for A&T and for PATH they all count as professionals, while the other studies mentioned in this chapter interviewed donor mothers directly, and have the perspective of patients/users. However, the reasons why mothers choose to donate, that was found in the present study, were in some ways similar to results found in studies with patient/user perspective. Miranda et al. (2016) found that several of the donors had the impression that donating human milk was a way of "helping others" and "saving lives". During interviews done in the present study, one of the informants from A&T mentioned that mothers' milk was "the source to life" and in her opinion, an important factor for child survival, especially for vulnerable infants. Pimenteira Thomaz et al. (2008) found that the two most common reasons to donate milk to the HMB were that it was a "recommendation from health professionals" and that they "knew the needs of the babies that the bank serve" (Pimenteira Thomaz et al., 2008). Alencar og Seidl (2009) found that the main reason for women to donate was "to help other mothers who are incapable of breastfeeding" (Alencar & Seidl, 2009). The same study also reported quotes that mentioned that when donating milk they also "contribute to life". A different aspect that occurred in the study by Miranda et al. (2016) was that some donors expressed a reason for donating milk was to "avoid waste". This

was also mentioned by Alencar og Seidl (2009), where 17 of theirs 36 informants mentioned that they wanted to avoid waste. This was not mentioned during the interviews with the informants used for the present study, but rather a "wish to share" if a donor mother experienced that she had too much milk. Miranda et al. (2016) also asked donor mothers at what point they had received information about the HMB, and only five out of 12 informants in total had heard about it before delivery. In this thesis there are no numbers about how many donor mothers received information about the HMB before the delivery, but some of the informants mentioned that some information sharing happened at prenatal checkup. Neither of the mentioned studies was carried out around the opening time of a HMB, but Mackenzie et al. (2013) who investigated mothers' knowledge of human milk banking in South Australia found that breastfeeding mothers (potential donors) were positive to the idea of donating their breastmilk to help other mothers and their babies as long as the milk was safe. The findings from Mackenzie et al. (2013) were also interesting compared to the already existing milk sharing system from the communities in Viet Nam mentioned during interviews. Apparently some mothers were already sharing their breast milk with other mothers who struggled with providing enough milk for their infant in. They had not taken the risk of contamination or infectious diseases in to consideration and this made it difficult for the HMB staff to recruit them. By extension one could argue that they didn't have knowledge about if the milk was safe. According to two of the informants, the potential donor mothers were hesitant to follow guidelines for hygiene and milk storing, and did not see the problem with the way they had shared their milk earlier.

5.3.4. Breastfeeding practices

If the HMB contributes to a change in breastfeeding practices at the hospital is difficult to say. However, some of the informants from the present study meant that it might have a positive impact. One of the informants from the HMB staff mentioned that she had changed her approach in regards to sharing information about breastfeeding from before the HMB was established, and that she had become more aware about sharing this information. Recommendations state that sharing information about breastfeeding can contribute to increased awareness in general, both for breastfeeding practices and the HMB (DeMarchis et al., 2016). Another informant also mentioned that the presence of the HMB could contribute in increasing people's knowledge about- and importance of breastfeeding. Pontes et al. (2017) looked at the implementation of a HMB and if it had an impact on nursing practices at the hospital. They wanted the nurses to have a more pro-breastfeeding approach when working at

the HMB, which is similar to what some of the informants from the present study mentioned. The author did not succeed in finding literature that revealed if a HMB actually contribute to changes, but because of training required from staff and promotion of breastfeeding through the HMB it is likely that it might have a positive effect rather than a negative effect on breastfeeding practices. Recommendations states that the HMB has an opportunity to work as a community breastfeeding program in infant feeding practices and therefor might have positive effects on breastfeeding practices throughout the community (DeMarchis et al., 2016). Through interviews it became clear that information sharing was a major part of HMB practices, and important for the establishment. The informants expressed concern about finding good ways to communicate about breastfeeding to both mothers and hospital staff. The author is under the impression that this is an important part of achieving good breastfeeding practices, especially since the information highlights the importance of mothers own milk as the best nutritional choice for infants. It is also possible that mothers who receive information about breastfeeding at the hospital will share information with other women outside the hospital, and in that way contributes to healthy breastfeeding practices in their communities.

5.3.5. Challenges when opening a HMB

The reported challenges and difficulties during the establishment of the HMB varied between informants because of different professions and responsibilities. However, there was a consensus that more staff was needed at the HMB. It is currently three employees at the HMB in DNHWC and in comparison there was a team of ten professionals at the HMB at Cassiano Antonio de Moraes University Hospital in Brazil in 1997 (Pontes et al., 2017). Pontes et al. found that it was difficult to recruit new staff members from the nurses because they didn't value the work of the HMB, and described it as "professional resistance". This however, was in 1996 when the HMB was considered more of a new subject so that might not be relevant today. From the interviews in the present study the biggest issue in regards to recruiting new staff was financial aspects and where to get funding. One approach to this problem could be increased efforts in building new networks (DeMarchis et al., 2016). Recommendations state that by working on networks with local agencies and governmental stakeholders, the HMB might receive additional funding from new sources. In addition, this is the first HMB in Viet Nam but more HMB are planned in the future which might help the current HMB get additional funding because of positive effects on infant care on a national level.

Another challenge that occurred was the total disposal of donor milk. The amount of disposed donor milk varied between 16 % of the total amount of donated breastmilk in August, to 45 % in May, and of the total 876, 9 L of donated milk, 22 % was disposed. It appeared to increase from February (18 %) to May (45 %), with the exception in March where 17 % was disposed. It did however increase from March to April, where 25 % of donated milk was disposed. During our second visit to the HMB, this was a huge problem and the HMB team struggled to find the source of contamination. Large amounts of the disposed milk were PDHM that had passed bacterial testing before pasteurization, but not the post-pasteurization test so an investigation was required. The whole pasteurization process needed to be carefully reviewed to find the problem. Donor milk needs to go through a long process, thus the reasons for disposal could be many. It could have been contaminated by donors, health staff, equipment or procedures. The author did not find the exact reason for this problem. It does however highlight the importance of bacterial testing and strict protocols to ensure that the milk is safe.

6.0. Conclusion

The specific objectives will be presented with conclusions to each of them. Finally, a summary conclusion will be presented, followed by implications for the future.

1. *To present background characteristics of the first HMB donors*

It became clear from both the descriptive data and findings from interviews that donors were mainly recruited from inside the hospital. It showed that 56 % of the donors recruited from February to August were mothers of preterm or sick infants admitted at the hospital. The total number of new donors each month did not seem no increase consistently. It might be a need to focus more on mothers outside the hospital in the future and find additional methods for recruitment to target these women. However, recruiting mothers of preterm infants might have been a smart way to find the first group of donors to the HMB because of easy access compared to mothers of full term infants who only stayed at the hospital for a short period of time.

2. *To present background characteristics of the first HMB in Viet Nam*

One of the main findings during this study was the increasing number of infants that started receiving PDHM from the HMB. It appeared to be a 2215 % increase from February, where 13 infants started receiving PDHM from the HMB, compared to August, when there was 301 infants. The amount of PDHM fed to infants increased accordingly with 6, 0 L in February and 114, 4 L in August, which is a total of 1807 %. This gives an impression about the need for a HMB, and how many infants that can benefit from its presence.

3. *To describe the experiences from the establishment of the first HMB in Viet Nam*

a. Why do mothers choose to donate, and how is the HMB recruiting donor mothers?

The reasons why mothers chose to donate their breastmilk to the HMB were many and various. An interesting finding was what appeared to be the main reason for mothers to donate their breastmilk; they were mothers of preterm infants who had already received donor milk from the HMB and wanted to "give back". They were all under the impression that the best way to recruit donors was through the neonatal care unit by approaching mothers who were admitted with their infants. This was because they were easy to access and share information with. To recruit donors from outside the hospital different communication strategies were used. This could be through information sharing at prenatal checkup, communication strategies through TV and internet, posters and relations with other people.

b. How can the HMB contribute to changes in breastfeeding practices at DNHWC?

If the HMB have contributed to changes in breastfeeding practices at DNHWC is difficult to say because the author did not have access to information before the opening. However, when the informants from HMB staff were asked, they appeared to be positive, and they even had personal experiences in regards to how their practices had been changed. One of the informants explained that before the HMB was established her only focus was skin-to-skin mother care in the delivery room, but after the HMB she provided consular services both in the delivery room and the post-natal ward.

In addition, an important part of the HMB was communication strategies about breastfeeding to both hospital staff and mothers which might indicate that there will be increased knowledge about breastfeeding at the hospital, which again can be positive in regards to breastfeeding practices. Informants also mentioned that the presence of the HMB might have had an effect

on people, and that the knowledge of breastfeeding might have increased amongst mothers admitted to the hospital.

c. *What were the challenges that occurred during the establishment of the first HMB in Viet Nam?*

The challenges that occurred during the establishment of the HMB varied between the groups of informants. The main challenge that was mentioned by all three groups was the need for more staff at the HMB in the future and where to get funding for this purpose. Other challenges were the cooperation between different stakeholders and organizations and recruitment of donors from outside the hospital. The HMB had to change their practices and let donors donate their milk from home due to demands from the donors. In addition, mothers were already sharing their breastmilk with other mothers that struggled to produce enough milk for their infants, and they didn't seem to take contamination or risk of infections in to account when doing this. It was a challenge to make them follow guidelines from the HMB.

6.1. Summary Conclusion and future studies

The findings from the establishment of the first human milk bank in Viet Nam indicate that there is a real need for HMB's in Viet Nam. According to the numbers describing how many infants that have already benefitted from receiving PDHM, more HMB's should be established in Viet Nam. In addition it will be interesting to see if the number of infants receiving PDHM continue to increase in the future. Future studies might be needed to find productive ways to recruit donors from outside the hospital to increase the number of donors. One approach could be recruitment from the maternal ward where mothers of both full term and preterm infants will be staying for a short period of time. In addition it might be interesting to see if the HMB get additional funding since it will be essential for future operations.

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Appendix 1.

Monthly Report from the monitoring system

From date….. month……year 201…. To date….. month……year 201….

Indicators	Total	%		
0. General hospital information				
0.0. No. of live births in the hospital				
0.1. No. of live births by vaginal delivery				
0.2. No. of live births by cesarean delivery				
0.3. No. of low birth weight (< 2500 g)				
0.4. No. of premature newborns (< 37 weeks)				
0.5. No. of new patients of the Neonatal Care Unit (NCU)				
0.6. No. of newborns born to mothers living with HIV/AIDS				
0.7. No. of orphaned or abandoned babies				
1. Recruiting, screening, and managing of donors		**DNWC Hospital**	**Com-munity**	**Other**
1.1. No. of group counseling sessions for demand generation (≤ 10 mothers)				
1.2. No. of demand generation events (>10 mothers)				
1.3. No. of lactating mothers of mothers who attended donor recruitment (total):				
1.3.1. One-on-one				
1.3.2. Group				
1.3.3. Event				
1.4. No. of mothers who expressed interest in donating after recruitment				
1.5. No. of mothers newly screened				
1.6. No. of lactating mothers newly screened and meet all requirements to be eligible to be a human milk donor				
1.7. No. of eligible human milk donors taught proper hygiene and donation skills (e.g., wash hands, safely express milk, store, label, and transport milk to the HMB)				
1.8. No. of new donors that donate milk				
1.9. No. of mothers who stop donating milk (e.g., exclude if the donor's child above 9 months old, due to disease status, no longer wish to donate, or have not donated milk for 90 days to this HMB)				
2. Receiving, storage, processing, and distribution of donor milk at HMB (Liter)				
2.1. Volume of milk donated (L)				
2.2. Volume of pasteurized donor milk (PDHM; L)				
1.1.1. Pasted pre-pasteurization test (L)				
1.1.2. Pasted post-pasteurization test (L)				
1.1.3. Pasted both pre- and post tests (L)				
2.3. Amount of donor milk disposed because of any reasons				
2.4. Total volume of PDHM at the HMB at the reporting time				
3. Usage of PDHM in neonatal units		**NICU**	**Postnat. wards**	**Other**
3.1. Volume of distributed PDHM (L)				
3.2. No. of children who started receiving PDHM from HMB				
3.3. No. of children currently using milk from HMB				
3.4. Volume of PDHM fed to infants (L)				
3.5. Average days of using PDHM (for those who stopped receiving PDHM during the reporting period)				
3.6. Amount of money received (Thousand VND)				
4. **Supportive supervision**				
No. of supportive supervision visits (i.e., mentorship or quality assurance)				

Appendix 2.

Donor screening form

DONOR SCREENING FORM (circulate to corresponding number of fill in the blank)

Interview date: ……/……/ 201…..

Names:…….. Year of birth: ……..

Age:……; if < 18 years, stop interviewing

Address: No. ……., street/village:…….…… ward/commune:…….……..

District:……., city/province ……Contact phone: ……..……

Child date of birth: ……/……/ 201….. Birth place: 1) Da Nang Hospital for Women & Children

No. of gestation weeks: ……. week 2) Other……

Birth weight: ……. grams Mode of delivery: *1. Vaginal 2. Cesarean section*

From whom did you hear about donating breast milk? (multiple-choice question)

1. Staff of Human Milk Bank
2. Staff at Obstetric Unit (antenatal care)
3. Staff at Postnatal Unit
4. Staff at Neonatal Unit
5. Other mothers or any other
9. Have not yet heard about donating

Where else did you hear about donating breast milk? (multiple-choice question)

1. Poster
2. Leaflet
3. Newspapers, magazines
4. Events
5. Facebook (Fanpage)
6. Website / internet
7. Video clip
8. Other……
9. Not any

I will ask you some questions. All information will be secured kept and only used for the selection of milk donors.

	Question	No	Yes
1.	Have you received a blood transfusion transplant in the last 6 months?	0	1
2.	Have you ever had hepatitis B or C, TB or cancers?	0	1
3.	Are you taking medication, traditional medication, substance, chemical, radio-active drugs? If yes, please list:	0	1
4.	Have you had a Measles, Mumps and Rubella (MMR) vaccine in the 4 weeks?	0	1
5.	Do you smoke or using any products with nicotine such as patches, lozenges, sprays containing nicotine; nicotine gum; the electronic cigarette?	0	1
6.	Do you regularly have more than 2 alcoholic drink weekly? An alcoholic drink is equal to 1/2 brandy (25ml), a glass of wine (100ml), or a cup of beer (200ml).	0	1
7.	Have you ever used one of substances / drugs such as opium, marijuana, cocaine, heroin, crystal meth, ecstasy?	0	1
8.	In the last 6 months have you participated in unsafe sex (not using condom) with your husband or partner who is at risk for HIV, HBV, HCV, or syphilis?	0	1
9.	In the last 6 months Have you pierced any part of your body or gotten a tattoo or scaring?	0	1
	Comments of observation from screening staff (if any):		

Lab test (within 3 months before the screening):

[ ] Test for HIV, HBV, HCV and syphilis negative [ ] Print or photocopy the test results

[ ] Eligible to give consent; _____(name of staff performing the screening)

Appendix 3.

Consent form for donor mothers

INFORMED CONSENT TO BE A HUMAN MILK DONOR

(To be read and signed by mother)

Human milk provides the best nutrition for infants and young children. It promotes comprehensive growth and development and helps to reduce the risk of illness. Human milk has a unique composition of nutrients, enzymes, growth factors, anti-inflammatory and immune properties. **The best option for a baby is its mothers own milk.**

When this is not available, **the next best option is pasteurized donor human milk from a milk bank**. Pasteurized milk is **safe, doesn't contain any food preservatives** and **retains most of** the nutrients, growth factors, anti-inflammatory and immune properties.

I confirm that:

1. I am 18 years of age or older.
2. I am donating excess / surplus breast milk after feeding my own baby. I am committed to having a healthy lifestyle during breastfeeding and donation (for example, I do not drink alcohol, or smoke and/or use illegal drug).
3. I understand that my donated human milk will be stored, processed and microbiologically tested to ensure it safe use in vulnerable infants. A responsible doctor will prescribe human milk for a recipient in need of donor milk as regulated by the human milk bank.
4. I will not expect my donated human milk to be returned to me or to receive compensation for my donated human milk.
5. I have the right to stop donating breastmilk at any time and will not be treated differently when I or my child use the hospital health care or services.
6. I undertake to inform the human milk bank of any changes in my health as soon as I become aware of it. Human milk bank telephone number is 05113 957 177.
7. I understand that all my personal information, including medical test results will be kept confidential.

I hereby give consent for my donated breast milk to be given by the human milk bank of the Da Nang hospital for Women and Children to any infant who are hospitalized and unable to access to their own mother milk.

CONSENT	Da Nang……/……/ 201….. Donor name	HMB staff
ATTENDING THE DONOR EDUCATION SESSION	……/……/ 201…..	
APPROVAL	……/……/ 201…..	
DONOR ID		
DATE STOPPED DONATING	……/……/ 201…..	

Appendix 4.

Registration of human milk donors

Unit: 1. HMB; 2. Neonatal ……; 3. Postnatal ……; 4. Other (specify) ……

Registration (Columns 1-3): ……/……/ 201….. Responsible person:……

Checking (Columns 4-14): ……/……/ 201….. Responsible person:……

Name of potential donor **Year of birth** **Contact phone number**	**Address**	**Gave birth at DNHWC**	**Had screening lab test results**				**Evaluate lab test**		**The next step**			**Interview and lab test arranged**	**Screened**
			HIV	HBV	HCV	Syphilis	≥ 1 test (+)	≥ 6 months	Lab test + Screen. interview	Screen. interview	Not qualify		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

Instructions: For this table, fill 1 for Yes, and 0 for No. Might bypass this form by filling in directly BM 3.

1) Initially, ask each mother about a "Positive" or "Abnormal" results of any Antenatal test results. If there is a positive result, inform the mother that she might not eligible, refer her to appropriate counseling, and do not list her name on this form.
2) If the test results for the mother are "Negative" or "Normal", the procedure will vary depending on the location:

Postnatal Ward: Fill columns 1-3; check medical record to fill in columns 4-9, and send the form to HMB

Neonatal Units or HMB: Fill columns 1-3 for all potential donors, write people in charge and date and send to HMB (if from Neonatal Units); check medical records (for those who delivered at Da Nang Hospital for Women and Children) and medical tests from other hospital (for those who delivered elsewhere to fill column 4-9.

3) Fill columns 10-12, and set up appointments with potential donors at HMB for donor screening.

Appendix 5.

Log form for milk donation

BM 4. Milk donation logbook - Sổ theo dõi hoạt động hiến tặng sữa (this form can be omitted in the electronic system)

ID_Do	Donor information			Date of			Information about each donation (fill in the date donated in the first row and the number of mL in second row. Information about expression date will be written in the label)									
	Name	Year of birth	Contact phone	Screening	Approval	Training	1	2	3	4	5	6	7	8	…	30
(1)	(2)	(3)	(4)	(5)	(6)	(7)										

Column 1-7 fill in information from BM 3. Each mother will have 3 rows. Fill information about each donation time (i.e., send milk to the HMB), horizontally. If used all 30 cells, fill in the next row.

Appendix 6.

Pasteurization record

A. DEFROST	Time; date	Fridge temperature	Implementer
Start:	……h……min; ……/……/ 201…		
End:	……h……min; ……/……/ 201…		

Information about defrosting of donor human milk:

Donor ID	Name	No. of bottles	Amount (mL)	Expired date
1.				
2.				
3.				
4.				
5.				

B. POOLING, POURING TO BOTTLE FOR PASTEURIZATION		
Start	……h……min; ……/……/ 201…	**Status of implementation:** [ ] Fully defrosted [ ] In the hood

C. LAB TESTS	No. of sample	Sample ID
Pre- Pasteurization		[ ] print test result
Post-Pasteurization		[ ] print test result

D.PASTEURIZATION	Time: start: _____ end: _____ [ ] print Pasteur. chart

Batch No:…… Pool No.:…… Total milk: ……. bottles; ……mL

Implementer: Signature_____ Names_____ Date……/……/ 201…

APPROVAL

Donor ID	Bottle number	Amount (mL)	Approver
Meet requirements:			
			Đà Nẵng ……/……/ 201…
			Signature_____
			Name_____
			Comments (if any):
For disposal (did not meet requirements):			

Appendix 7.

Consent form for PDHM recipient

Recipient unit: 1) Neonates care ward……; 2) Post-natal unit……; 3) Other……

Human Milk provides the best nutrition for infants and young children. It promotes comprehensive growth and development and helps to reduce the risk of illness. Human milk has a unique composition of nutrients, enzymes, growth factors, anti-inflammatory and immune properties. **The best option for a baby is its mothers own milk.**

When this is not available, **the next best option is pasteurized donor human milk from a milk bank**. Pasteurized milk is **safe, doesn't contain any food preservatives** and **retains most of** the nutrients, growth factors, anti-inflammatory and immune properties.

My name is …… the mother (or primary caregiver) of

…… infant. I understand that:

1. Donated human milk has been **stored, processed and microbiologically tested** at the discretion of the human milk bank, Da Nang Hospital for Women and Children.
2. Donated human milk is **safe to be used for the newborn**, including low birth weight, preterm, and sick infants. Responsible doctor will prescribe human milk for recipient as regulated by the Da Nang hospital for Women and Children.
3. Human milk donors have met all criteria to be safe human milk donors. They are all healthy, have healthy lifestyle (do not drink alcohol, smoke and use illegal drugs), have undergone medical tests and be confirmed that they are free of any infection with HIV, hepatitis B, hepatitis C and Syphilis. All human donors' personal information, including health condition and medical test results will be kept confidential.
4. Stock of donor milk may be limited and not always available for all infants.
5. The hospital will charge a fee of using donated human milk to cover part of operation costs. The fee is approved by Da Nang City Department of Health.
6. I will accept lactation support to ensure that I can supply sufficient milk to my infant.
7. I/ recipient mother need to establish my own supply of breast milk so will attempt to feed my own baby or express 8-12 times in 24 hours
8. I confirm I am 18 years of age or older. (If mother is under 18 years old, the infant legal guardian will sign).

After explained by my infant doctor, I **agree to use** donated human milk for my infant and **to pay** for the fee as the hospital regulation.

Đà Nẵng ……/……/ 201…

Recipient mother or legal guardian name: Medical officer

_____ _____

Appendix 8.

Interview guide for milk bank leader

Interview guide, Leader	
Date:	Place:
Age:	Job title:
How long have you been working for X?	
1) Can you describe why the HMB is necessary in Viet Nam? - In what way, do you think that the HMB will contribute to a reduction in child mortality? - (follow up: Why?) - How did you experience the process of establishing the HMB? Were there any obstacles or difficulties? - Did you have any source of inspiration?	
2) Have breastfeeding practices changed at the hospital since the establishment of the HMB? - Is there a commonality to when mothers start to breastfeed? - How soon after birth?	
3) Why do you think mothers donate their milk to the HMB? - What's your impressions to why they donate? - How do you recruit donors?	
4) Can you tell me about the process of staff training before opening the HMB?	

Appendix 9.

Interview guide for HMB staff

Interview guide, Staff	
Date:	Place:
Age:	Job title:
How long have you been working at the hospital?	
1) In what way are mothers receiving information in regards to own milk production and breastfeeding (spoken? Written? Both?) - What advice do you give about breastfeeding? - In your opinion, do you think mothers receive enough information about breastfeeding at the hospital? - When do they receive this information?	
2) Why do you think mothers choose to donate their milk to the HMB? - What compensation/reward are the donors receiving for donating their milk? - Do the donors have information in regards to the recommendations on exclusive breastfeeding for the first six months? - How do you recruit donors?	
3) Do you know if kangaroo-mother-care (KMC) are being practiced at the hospital?	
4) Can you tell me about the process of staff training before opening the HMB?	

Appendix 10.

Interview guide for A&T and PATH

Interview guide, A&T and PATH	
Date:	Place:
Age:	Job title:
How long have you been working for X?	
1) What was your part in the establishment in the HMB? - [FOLLOW UP] - How did you experience your role in the establishment?	
2) Can you describe why the HMB is necessary in Viet Nam? - (Follow up: Why?) - How did you experience the process of establishing the HMB? Were there any obstacles or difficulties? - Did you have any source of inspiration?	
3) Why do you think mothers donate their milk to the HMB? - What's your impressions to why they donate? - How do you recruit donors?	
4) Can you tell me about the process of staff training before opening the HMB?	

Appendix 11.

Checklist for observations

Staff	
Enough staff?	
Hand washing routines	Yes. Very good
Facilities	
Clutter?	Some paper in the past. Room, but not on in the clean area
Cleanliness?	Good (the past. Room was cleaned before the past. Process started. I have however, not taken bacterial test
Temperature control or freezer/refrigerator	Yes. Temperature is documented three times per day
Procedures	
Cleaning of utensils	Decomaninated/sterilized
Labeling of milk at all stages - Date of expression - Date of past. - Expiration date	Mother ID Milk to unit Start of defrost Expiration date
Pooling: number of donors	No pooling.
Pretest how/when	Before past. Procedure. Small amount collected and stored in fridge.
Pasteurization	Yes
Cooling	In fridge. Although, after the milk was pasteurized is was placed directly in to freezer
Posttest how/when	Yes. Right after pasteurization
Storage post pasteurization	Freezer
Temperature control of freezer	Yes
Storage time of milk in deep freezer	Yes
Sealing bottles	Yes
Dress code in process room	Yes (munnbind, hårnett, smittedrakt, hankers og sko)
Tracking/documentation	
Temperature records kept?	Yes
Microbiological test record kept?	Yes
Is the donor milk traceable?	Yes
Registrated information kept systematic	Yes
SOP's available for which prosesses	Yes. Not available in English
Donor information and registration	
Blood test checked?	Yes
Concent given?	Yes
Medical history taken?	Yes
Hand washing?	Yes
Breast cleaning?	Yes
Clean utensils?	Yes
Information on hand expression?	Yes
Storage of milk?	Mothers express at neonatal ward and put the milk in a refrigerator. Later, HMB staff picks up the milk If the mother is storing milk at home, HMB staff come to their house and consider if it is of good enough standard to keep milk there. The donors receive information about storage.
Recipient and handling of milk	
Concent given?	Yes
How is it thawed?	In refrigerator over 24 hours
Storage of milk?	Freezer and refrigerator on the neonatal ward
Routines in the milk kitchen?	Yes
Clutter	No
Cleanliness	Good
Cleaning of utensils	Yes (decontaminated)
Documentation for use of milk	Yes