CICF Learning Series

County Innovation Challenge Fund
Transforming Maternal & Newborn Health

PATH

**Helping babies thrive:**

Establishing the First Integrated Human Milk Bank System in Kenya

May 2019

*The first **human milk bank** in Kenya was recently inaugurated at Pumwani Maternity Hospital in Nairobi, opening a new frontier in the country's efforts to **save newborn babies and safeguard their future health**. This brief looks at this new development to provide information for other counties and healthcare providers elsewhere, who may be interested in setting up similar facilities in their settings.*


## Benefits of breastmilk

WHO advises that newborn babies should be exclusively breastfed for **at least the first six months** and continue breastfeeding for two years. Breastmilk provides all the energy and nutrients that an infant needs for the first months of life, and it continues to provide **up to half or more of a child's nutritional needs** during the second half of the first year, and up to one-third during the second year of life. Breast milk promotes sensory and cognitive development, and protects the infant against infectious and chronic diseases. Exclusive **breastfeeding reduces infant mortality** due to common childhood illnesses such as diarrhoea or pneumonia, and helps for a quicker recovery during illness.

## Introduction

Each year, an estimated 196,000 babies in Kenya are born prematurely, while 8% are of low birth weight – less than 2.5kgs (WHO, 2012[1]). These vulnerable babies need special care and nutrition to survive and thrive. Data also show that 362 mothers in Kenya die in every 100,000 live births due to pregnancy-related causes (KNBS, 2015[2]). Their deaths leave their babies more vulnerable without access to their mother's breast milk. Other newborns are denied the chance to breastfeed for other reasons, for example, when the mother is too unwell to breastfeed or has delayed lactation due to premature delivery and the stress associated with it. In some cases, some infants are abandoned shortly after birth. One study reported that of 490 abandoned infants received in one Nairobi-based children's home between June 1994 to December 2002, 38% were newborns brought in by public health facilities and the police (Wangai et al, 2007[3]), indicating they had been abandoned at birth.

Breast milk is recommended by the World Health Organization (WHO) as the first and superior feeding option for all newborns, but especially these vulnerable babies to meet their sensitive nutrient requirements and to promote optimal health, growth and development.

Breast milk is especially important for low-birth weight and pre-term babies who urgently need its nutritive benefits in order to survive. However, in Kenya, a local study found that only a tiny proportion (14%) of newborns in urban health facilities who were physically separated from their mothers immediately after birth were given their mother's milk during the separation, and that the rest were either not fed on anything or were fed on formula or cow's milk (Kimani-Murage, Israel-Ballard, and Zerfu, 2018[4]). Cow's milk is not recommended for infants because it is hard for their bodies to digest, while formula is associated with frequent infections, feeding intolerance as well as inflammation of the digestive tract.

# Human milk banks: a life-saving alternative for vulnerable newborns

When breastfeeding is not possible, the WHO recommends that vulnerable newborns should be given breast milk donated by another mother in settings where **safe** and **affordable** milk-banking facilities are available or can be set up, to help vulnerable newborns to survive and thrive (WHO, 2011[5]).

A human milk bank (HMB) is a service to recruit breast milk donors, collect donated milk, and then process, screen, store, and distribute the milk to meet infants' specific needs for optimal health. Different models exist, including community, hospital or health facility-based models (PATH, 2019[6]). Donor recruitment in a health facility-based model occurs primarily in the hospital and the milk collected is predominantly used in the neonatal unit. On the other hand, a community-based human milk bank operates independently from a hospital and is not physically connected to a health facility. Donor recruitment occurs primarily in the community and the milk collected is received by several hospitals and health facilities.

Integrated with other life-saving neonatal health interventions such as kangaroo mother care for pre-term and low-birth weight babies, human milk banks can play a significant role in increasing infant survival and well-being. Compared to infant formula, donated breast milk is associated with a much decreased risk of diarrhoea, feeding intolerance, and the risk of Necrotizing Enterocolitis, an invasion of the wall of the gut with bacteria causing inflammation and destruction of the wall of the intestine, among other infections (Boyd et al 2007[7], Arslanoglu et al, 2013[8]).

As part of its global work to strengthen newborn nutrition, PATH developed the Mother-Baby Friendly Initiative Plus (MBFI+) model, which focuses on increasing access and intake of human milk in a comprehensive approach that integrates breastfeeding, Kangaroo Mother Care and provision of safe donor human milk, when needed. Data has shown that if implemented in this way - embedded within, not separate from, a breastfeeding promotion programme - the presence of a human milk bank is associated with increased rates of breastfeeding at discharge (DeMarchis et al, 2017[9]; Arslanoglu et al, 2013).

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Figure 1: Integrated systems for increased access to human milk. (source: PATH, 2019).

# Setting up the first human milk bank in Kenya

In March 2019, Kenya launched the first human milk bank in the East Africa region, a hospital-based model located at Pumwani Maternity Hospital in Nairobi County and implemented as an MBFI+ model. The bank is located within the neonatal unit and is managed by neonatal unit staff. It was funded by UKAid through the County Innovation Challenge Fund (CICF) and implemented in collaboration with PATH, Nairobi County government, Ministry of Health (MOH) and the African Population and Health Research Centre (APHRC). This pilot builds on PATH's global leadership in this field and implementation of the MBFI+ approach in South Africa and Vietnam. Figure 2 summarises the process followed to set up the HMB at Pumwani. The launch was the culmination of a systematic and phased approach to build capacity, integrate nutrition and newborn systems, and increase rigor to demonstrate impact, working closely with local stakeholders and the government to ensure ownership and sustainability.

The PATH team explaining about Human Milk Banking during the World Breast Feeding week 2018.

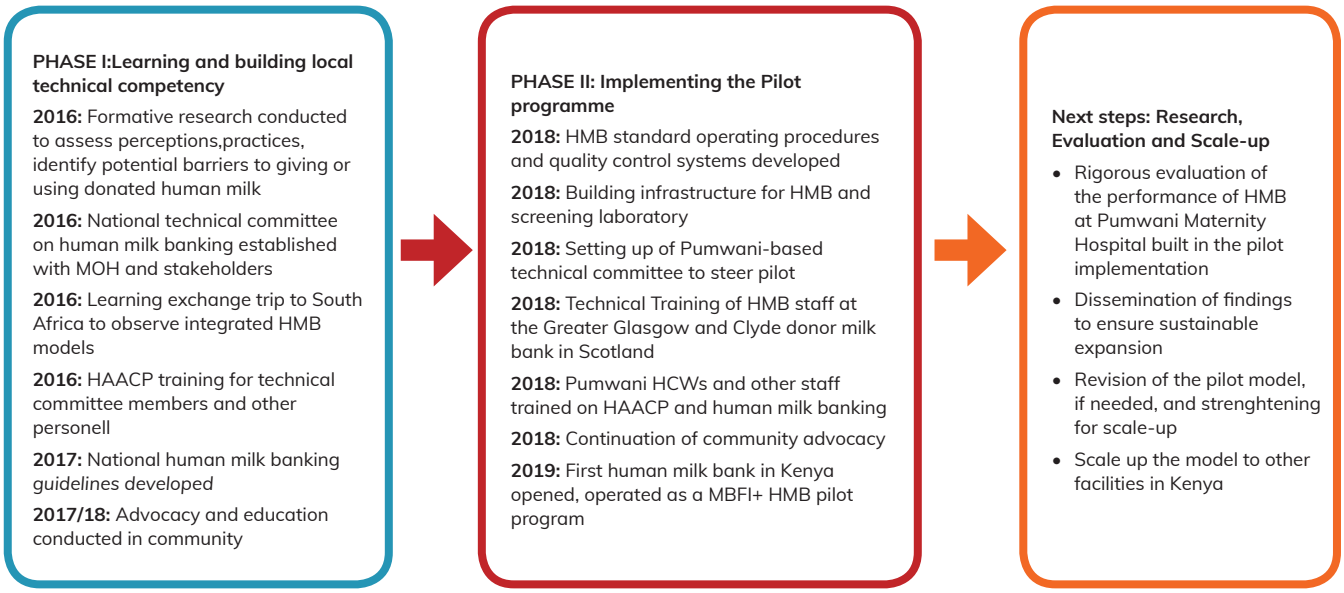



Figure 2: Journey to setting up Kenya's first Human Milk Bank (HMB)

In 2016, as the concept of a human milk bank gained traction in Kenya, a consortium of partners led by the Ministry of Health and with technical support from PATH, began laying ground for human milk banking. As part of the critical initial phase, formative research was conducted by the APHRC to assess perceptions and practices about donated human milk, and the feasibility of setting up a HMB in Kenya (APHRC, 2017[10]). The findings showed that human milk banking is potentially acceptable and feasible in Kenya, and that although the idea was new to the mothers interviewed, majority were positive about it - 80% indicated they would donate their breast milk to an HMB, and about 60% would allow their children to be fed with DHM. *"It depends, maybe I can have a lot of milk and she does not have milk, you know it is compatible maybe, I can express my milk and help her because that child should not be eating other food apart from mother's milk. [...] if the mother is not alive, she has died and left a baby and you are there and you have milk, you need to breastfeed that child..." (IDI mother, cited in Kimani-Murage et al, 2017[11]).*

A national technical committee was also formed in 2016, to bring key stakeholders from different sectors together to provide guidance on implementation strategies appropriate for the Kenya context. A critical step towards gaining technical and advocacy competency on HMB systems and integration was a MOH-led delegation traveling to South Africa to gain a better understanding of the required infrastructure and policy requirements. Members of the technical committee, and later, the staff in Pumwani Maternity Hospital (at least one person from each department) received intensive quality assurance and technical training using PATH's validated Hazard Analysis for Critical Control Points (HACCP) for Human Milk Banking resources. The HACCP is a best practice in any food processing/handling system and identifies points of potential hazards, contamination, or mishandling and creates checkpoints for preventing issues before they arise, thus reducing the risk of spreading disease. A locally adapted quality assurance plan was developed to identify and mitigate risks and ensure safety in the Pumwani HMB.

# Implementation: The Pumwani experience

### Launch of the HMB

Following intensive readiness assessments, the human milk bank at Pumwani Maternity Hospital was established but was officially commissioned in 2019 after the laboratory was fully equipped to handle screening of the donated human milk. The Newborn and Infant Care Unit at the hospital has a capacity of 150 cots and an average occupancy of 60 infants at any one time. It is estimated that at least 10 - 12 of these infants would benefit from donated human milk due to prematurity, low birth weight, or not having access to their own mother's milk. By May 2019, a month after opening, the bank has registered 32 donor mothers and 12 newborns have benefitted from the donated milk.

### Recruiting donors

Currently, the human milk at the Pumwani Bank is donated by mothers in the maternity ward who are nursing but have more milk than their baby needs. Rather than waste it, these mothers are given a facility that allows them to express the excess milk for the bank. In other countries, donors sometimes include mothers who have lost their own child.

***"The lactation manager provides support to lactating mothers, and once she notices one who has excess milk, much more than her baby needs, she informs her about the milk bank and asks her if she is willing to donate it. The mother should have a surplus of at least 30mls of milk to be invited to donate",***

***(Faith Njeru, Paediatric Nurse, Pumwani).***

Mothers who consent to donate are counselled by a nurse before they undergo a health and lifestyle-related screening who explains what the process involves and how the milk is handled. The screening process is two-step: first, a health and lifestyle questionnaire is used, to rule out risks of infection related to health and lifestyle factors, and a laboratory blood test. Women are excluded from donating milk if they take alcohol, use tobacco and drugs, if they are living with HIV, or are found to have Hepatitis B or C, or Syphilis.

***"We rule out all risk factors using a questionnaire which helps to screen lifestyle and health-related risks that may make her ineligible to donate,"***

***(Faith Njeru, Paediatric Nurse, Pumwani)***

**Processing the milk**

Donor mothers are given an identity number to preserve confidentiality and are counselled on how to express milk safely and hygienically. They may express manually or using an electric pump. All milk is stored frozen and in batches coded per individual mother until the volume is enough for pasteurization (the heat treatment required to kill any bacteria or viruses).

***"We do not pool (combine) milk from different mothers; each mother's milk is handled separately during storage and pasteurisation process,"***

***(Faith Njeru, Paediatric Nurse, Pumwani)***

## Why Pumwani?

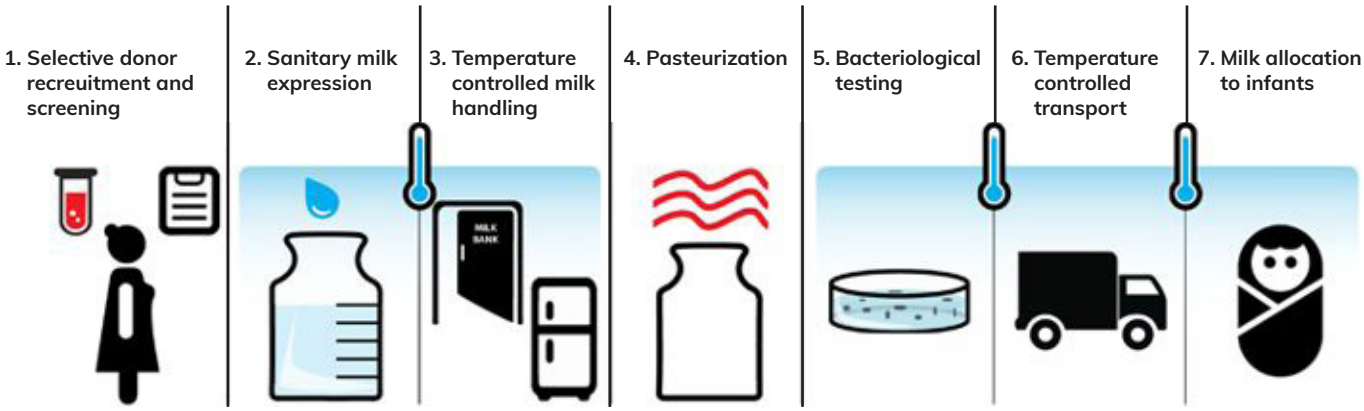

The Technical Working Group identified Pumwani as the site for the first human milk bank in Kenya because, as one of the largest maternity hospitals in the country, it handles hundreds of newborns each year and has high need for a human milk bank. Additionally, the hospital had the following in place:

- Promotion of breastfeeding and Kangaroo Mother Care as part of the neonatal care programme
- Adequate physical space
- Commitment and ownership demonstrated by hospital management and Nairobi County Government, signalling potential for sustainability and long-term support.

## Quality control:

The **hazard analysis** conducted at the planning stage identified all potential points of contamination risk, and is strictly observed in a rigorous process to ensure the final product is **safe for the baby**. Mothers are educated on sanitary expression and provided with the facilities to minimise contamination, and the milk is stored in the freezer immediately. **Batch sample testing** is done throughout the process, before pasteurisation and after. The **safe milk is safely stored** and issued out on prescription to babies who meet the criteria as the most vulnerable.

Figure 3: Steps in ensuring safety in human milk banking (Source: PATH, 2019)



# Emerging insights from the pilot project

It is expected that as an MBFI+ integrated model, the bank will lead to an increase in awareness of the value of human milk and breastfeeding and build public demand for ensuring all infants receive human milk and also increase willingness to donate in the community. Although still in the early operational period, the pilot HMB project at Pumwani has generated important insights for the project team:

a) **High levels of acceptability of the innovation by mothers and willingness to donate excess milk have been observed:** Within the first week of opening, the facility had registered ten mothers as donors. In addition, while the nurses help identify potential donors and approach them to raise awareness, some mothers who have excess milk have also volunteered on their own to donate, having heard about the facility from the others. ***"The acceptance rate is that high" (Dr Minnie Kibore, Programme Consultant, PATH).***

b) **Collaboration and leadership by the Pumwani community, the Ministry of Health and the Nairobi County government have been critical to ensure ownership:** While CICF provided project funds for renovating the facilities as well as purchasing the equipment, the Pumwani Hospital Management donated the facility space and the county government provided funds to equip the screening laboratory to ensure it can support the pilot adequately. In addition, the county government contributes all the staff that work in the HMB, while Pumwani Hospital has ensured its staff are sensitised on the initiative through the Continuing Medical Education programme. This collaboration has been critical in securing the successful launch and eventual sustainability of the HMB.

c) **Having champions and advocates for the project helped to secure support:** Due to intensive advocacy efforts during the initial phase of this work, the concept of a human milk bank in Kenya was well received in the highest policy levels; the Ministry of Health's Department of Nutrition and Dietetics and Nairobi County Government provided much needed leadership and support to move it forward. Advocacy efforts remain critical to its success: ***"The [Nairobi] county assembly members 'got it' and ran with it, and have committed to ensure that it will have enough money allocated to it in the budget to keep it going" (Dr Kibore, Programme Consultant, PATH).*** Subsequently HMB operational costs, including consumables and training have been included in the proposed 2019/2020 budget of the County Department of Health. This demonstrates tangible evidence of Government ownership.

Continued advocacy is still required to make sure that the public fully understand and continue to support the concept of human milk banking as the best option for infants who do not have access to their own mother's milk. In addition, regular training is required to refresh existing clinical and non-clinical staff and sensitise new recruits on the HMB concept and its role in an integrated neonatal health programme. Research has been inbuilt into the pilot to generate evidence and other information that will assist in planning for scaling up.

A mother and her new born baby at Pumwani Maternity ward

# The Future:

The successful launch of the Pumwani HMB pilot and the demand noted so far, including reported demand from other hospitals in Nairobi County and elsewhere, indicates that the innovation fills a demonstrated gap in Kenya's health services. ***"This is a beginning to the concept, there are so many possibilities, so many models that we could adopt, to ensure every child benefits from breastfeeding" (Dr Mary Waiyego, Neonatologist, Pumwani Hospital).***

Pumwani Maternity Hospital is well placed to serve as a centre for excellence and learning for other counties in Kenya as well as facilities in the private sector and in other eastern African countries. A cohesive mechanism for ensuring quality assurance, cross learning and adherence to quality standards will be imperative, perhaps through a future national or regional association of human milk banks. Within the East African community, Kenya is taking the first step in strengthening systems to ensure that all infants will have equitable access to lifesaving human milk. ***"Now that we have a model, other counties and countries in the East Africa region can come and learn. There is a lot of interest and Pumwani is well placed to serve as a centre of excellence in human milk banking in the region" (Dr Kibore, Programme Consultant, PATH)***

## Footnotes


1 WHO, "Born too soon; The Global Action report on preterm birth;" WHO, Geneva, 2012.

2 Kenya National Bureau of Statistics. 2015. 2014 Kenya Demographic and Health Survey. Rockville, MD, USA

3 Wangai, A. M., Jr, Wangai, M., Beckenham, M., & Beckenham, C. (2007). From HIV Abandonment to Adoption: Case study of New Life Home for abandoned babies, Kenya. Sultan Qaboos University medical journal, 7(3), 239–246.

4 Data cited in E Kimani-Murage, K Israel-Ballard, TA Zerfu. 2018. Pilot Testing of the Mother and Baby Friendly Initiative plus Model for Human Milk Banking at Pumwani Maternity Hospital in Nairobi County (MBFI+ Project). Baseline Report

5 World Health Organisation. 2011. Guidelines on optimal feeding of low birthweight infants in low-and middle-income countries. Geneva

6 PATH. 2019. Strengthening Human Milk Banking: A Resource Toolkit for Establishing and Integrating Human Milk Bank Programs--A Global Implementation Framework. Version 2.0. Seattle, Washington, USA

7 Boyd, C. A., Quigley, M. A., & Brocklehurst, P. (2007). Donor breast milk versus infant formula for preterm infants: systematic review and meta-analysis. Archives of Disease in Childhood. Fetal and neonatal edition, 92(3), F169–F175. doi:10.1136/adc.2005.089490

8 Arslanoglu S, Moro GE, Bellu R, Turoli D, De Nisi G, Tonetto P et al. Presence of human milk bank is associated with elevated rate of exclusive breastfeeding in VLBW infants. J Perinat Med 2013; 41(2): 129–131.

9 DeMarchis A, Israel-Ballard K, Mansen KA et al. Establishing an integrated human milk banking approach to strengthen newborn care. J Perinatol. 2017;37:469-474

10 African Population and Health Research Centre. 2017. Integrating Human Milk Banking with Breastfeeding Promotion and Newborn Care: is Kenya Ready? Briefing Paper

11 E Kimani-Murage, K Israel-Ballard, TA Zerfu. 2018. Pilot Testing of the Mother and Baby Friendly Initiative plus Model for Human Milk Banking at Pumwani Maternity Hospital in Nairobi County (MBFI+ Project). Baseline Report


CICF Learning Series

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**For more information about this project, please contact:**
Rosemarie Muganda
rmuganda@path.org

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