

# Early Breastfeeding Cessation and Replacement Diets are an HIV Prevention Method in Lilongwe, Malawi: The BAN Study

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## Background

2.3 million children are infected with HIV/AIDS worldwide, and over 2 million live in sub-Saharan Africa (UNAIDS/WHO, 2006). In Malawi, 91,000 infants are HIV+. Mother-to-child transmission (MTCT) of HIV accounts for 90% of pediatric (0-14yrs) cases (UNAIDS, 2006).

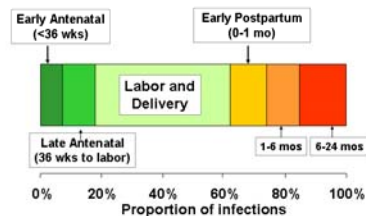
Without intervention, approximately 35% of infants would become infected by MTCT; 40% of these infections occur postpartum via breastfeeding.

Breastfeeding provides great health benefits in resource poor settings, significantly reducing infant morbidity and mortality (Victora et al., 1989). Mixed feeding is the cultural norm but poses the greatest risk of MTCT.

Exclusive breastfeeding (EBF) provides greater protection from infections other than HIV during the first 6 months of life (DeCock et al., 2000) while dually posing less risk of HIV transmission (Coutsoudis et al., 1999; Iliff et al., 2005).

The BAN Study is an on-going, randomized controlled trial in Malawi; designed to evaluate antiretroviral and nutrition interventions for reducing MTCT of HIV during breastfeeding. This PMTCT trial provides ARVs to all participants during labor & delivery. Newborn infants are largely HIV-free, enabling the efficacy of ARVs and/or nutrition interventions to be evaluated during the breastfeeding period. All mothers are counseled on proper infant feeding methods (ie. EBF) according to the WHO HIV infant feeding guidelines.

The WHO HIV and infant feeding guidelines recommend EBF for up to 6m among HIV+ mothers choosing to breastfeed, with cessation of BF once replacement feeding is AFASS (WHO, 2001, 2003, 2006). Mothers typically BF to 24m in Malawi. Ending BF by 6m is very difficult for both the mother and infant and puts the infant at risk of malnutrition since traditional weaning diets are nutritionally inadequate.



## Timeline:



## BAN Study Objectives

1. Evaluate the benefit of a nutrition supplement given to mothers during breastfeeding
2. Evaluate the benefit and safety of antiretroviral medications given to either infants or their mothers to prevent HIV transmission during breastfeeding
3. Evaluate the feasibility of EBF to 6 months followed by early, rapid breastfeeding cessation (BAN-Protocol, 2004).

## Methods

Mothers are counseled during their antenatal visits, labor and delivery, and post partum visits.

BAN Study nurses counsel all HIV+ mothers to practice EBF 0-6 months, early and rapid cessation of breastfeeding before the 7th month, maintenance of breast health, and complementary feeding (BAN-Protocol, 2004).

Counseling session scripts include the rationale, methods and support for exclusive breastfeeding; preparation and practice during the transition to replacement feeding; and complementary feeding after 6 months.

Complementary Feeding Counseling Script - counseling tool to 1) instruct mothers when to introduce certain foods and 2) provide guidance on feeding frequency, quantity and quality of complementary foods. Nutrient and energy dense RUTF is supplied to infants as a breast milk substitute starting at 24wks.

## Data Collection

BAN Study nurses collect infant 24-hr diet recalls to monitor infant feeding patterns for the duration of the study.

Mothers are probed to report portion size and proportion of mixed dishes consumed using food models.

A Malawi Nutrient Food Composition database was constructed by the UNC BAN Nutrition team to evaluate recalls based on standard recipes.

Infant diet recalls were collected at study visits 28, 32, 42, and 48 to determine if mothers indeed performed early breastfeeding cessation, and if replacement diets were adequate



## Internship Objectives

1. Enter infant diet recalls collected between 7-12m (28, 32, 42, and 48wks) - 547 infants \* 4 diet recalls = 2188 infant diet recalls
2. Evaluate the nutrient adequacy of the replacement diet

## Potential Deficiencies

Non-breastfed infants 6-24 months are at risk of micronutrient deficiencies.

-10 micronutrients identified as problematic: vitamin A, thiamin, riboflavin, niacin, vitamin B6, folate, vitamin C, calcium, iron, and zinc (Dewey et al., 2004).

-Traditional weaning diet in Malawi is a maize-based cereal porridge (phala), with little diversity. Diets based primarily on phala result in deficiencies due to low nutrient intakes and high concentrations of phytic acid, polyphenols, and dietary fiber, all of which inhibit nutrient absorption (Gibson and Hotz, 2000).

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Figure 1. Evaluation of replacement diet adequacy.

Nutrient	Infant Intake	Nutrient Requirement (EAR or AI)
Energy	Average of 4 recalls	EER = (89 x weight [kg] - 100) + 22kcal
Protein	Average of 4 recalls	Protein = 1.0g/kg/day
Iron	Average of 4 recalls	6.9mg/day
Zinc	Average of 4 recalls	2.5mg/day
Calcium	Average of 4 recalls	270mg/day
Vitamin A	Average of 4 recalls	500 µg/day
Thiamin	Average of 4 recalls	0.3mg/day
Riboflavin	Average of 4 recalls	0.4mg/day
Niacin	Average of 4 recalls	4mg/day
Vitamin B6	Average of 4 recalls	0.3mg/day
Folate	Average of 4 recalls	80 µg/day
Vitamin C	Average of 4 recalls	50mg/day

\*To reduce day-to-day variation, nutrient intake values will be averaged across the 4 visits.  
1) Usual intakes will be summarized with descriptive statistics (ie. means, medians, standard deviations, minima, and maxima). 2) Usual nutrient intake will be interpreted as %EAR Adequacy to graphically represent intake distributions.

Using the EAR cut-point method we will determine the prevalence of inadequacy within our sample population and if this outcome is affected by seasonal variation.