



Department of Health
Republic of South Africa

HIV and Infant feeding

January 2009



ark
absolute return for kids



Feeding Choices ?



Main Entrance to Bisho Hospital, EC, April 2008



Exclusive breastfeeding



Babies need
breast milk only, for the
first 6 months
of life





Newcastle Provincial Hospital, KZN, November 2008

WHO breastfeeding recommendations

HIV and infant feeding WHO 2003

- infants should be exclusively BF for first 6 months of life to achieve optimal growth, development and health
- after 6 months, they should receive nutritionally adequate and safe complementary foods while BF continues up to 24 months

Golden standard

2 -3 times per day at 6 – 8 months of age
3 – 4 times a day from 9 – 24 months age
with additional nutritious snacks offered
once or twice a day

Note: These recommendations also apply to women who are HIV negative or who do NOT know their status

WHO breastfeeding recommendations

- infants confirmed early to be HIV-infected (with PCR) who were still BF should continue up to two years (as per the general population)
- home modified animal milk NOT recommended for infant under 6 months age
- *after* 6 months, can add 200 – 400ml animal milk if other animal source foods, (otherwise 300 – 500 ml of animal milk per day)

Nutritional requirements

- resting energy expenditure is *increased* by $\pm 10\%$ among asymptomatic children who have HIV
- the energy needs of children (and adults) increase an additional 20 – 50% during convalescent catch-up period after a *severe infection*
- children need a balanced diet of which 10 to 15% is protein

Value of Breast feeding

- first 6 months
 - provides all the *fluids* and *nutrients* required
- 6 – 12 months
 - BF provides 60 – 80% of all energy, protein and other nutritional requirements
- up to 2 years
 - provides 35 to 40% of these requirements
- family planning
- psychosocial development

↓ Balance of risk ↑

Risk of HIV transmission

Risk of malnutrition and death



SOUTH AFRICANS AND AMERICANS
IN PARTNERSHIP TO FIGHT HIV/AIDS



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Estimated risk and timing of MTCT of HIV in the absence of interventions

Timing	Transmission rate
During pregnancy	5 – 10%
During labour and delivery	10 – 15%
During breast feeding	5 – 20 %
Overall without breast feeding	15 – 25%
Overall with breast feeding to 6 months	20 – 35%
Overall with breast feeding to 18 to 24 months	30 – 45%



PMTCT dual therapy

Definitions

- *CD4 cells* = T4 or helper cells, key to both humoral and CMI responses; main target for HIV
- *cell associated virus* = HIV which lives inside the cell (measured with HIV-RNA)
- *cell-free virus* = parts of the virus (virions) not associated with a cell, measured as HIV-RNA



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WHO, UNAIDS December 2007

Feeding choices ?

“Nationally, only about 12% of mothers breast feed exclusively in the first few months, dropping to fewer than 2% after the baby is four months of age. If nothing but breast milk must cross these babies’ lips, then a lot more than lip service should come from communities, their leaders and our health departments acting together “.

Associate Professor A Westwood, School of Child and Adolescent Health,
UCT , 13 February 2008 Cape Times

Introduction

- the HIV pandemic has created confusion, misunderstanding and fierce debate about infant feeding
- optimal feeding pattern for overall child survival is EBF for up to two years with complimentary feeding from 6 months age*
- the rate of HIV transmission from mother to child during BF ranges from 5% to 20% depending on:
 - length of time mother breastfeeds
 - degree of mother's immuno-suppression

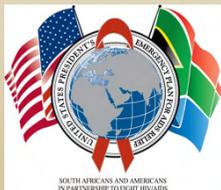
*Global Strategy for Infant and Young Child Feeding, WHO 2003



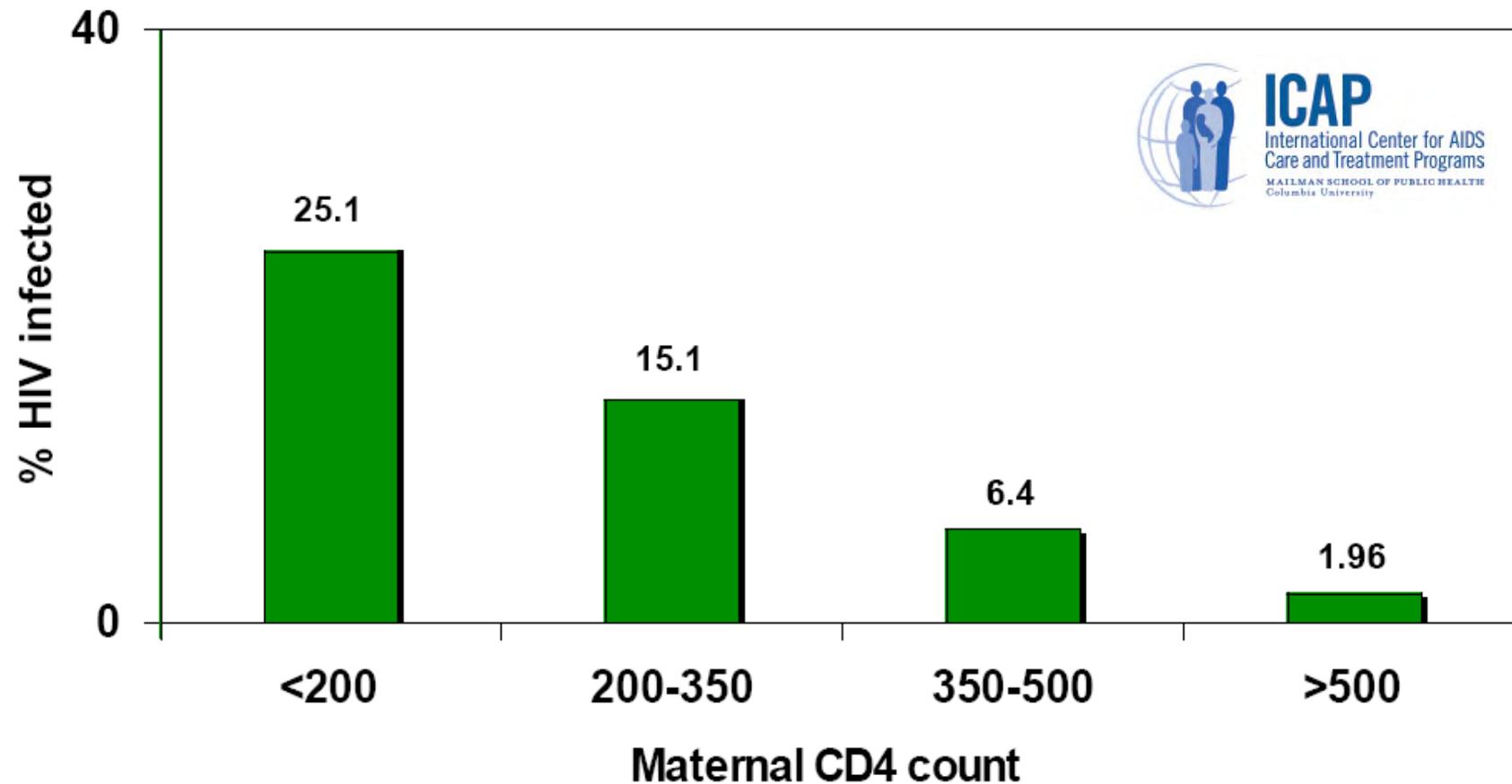
Primary Health Clinic, KZN 2007

Post-natal transmission of HIV

- *risk factors include :*
 - low maternal CD₄ count
 - high viral load
 - maternal sero-conversion during breast feeding
 - duration of breastfeeding



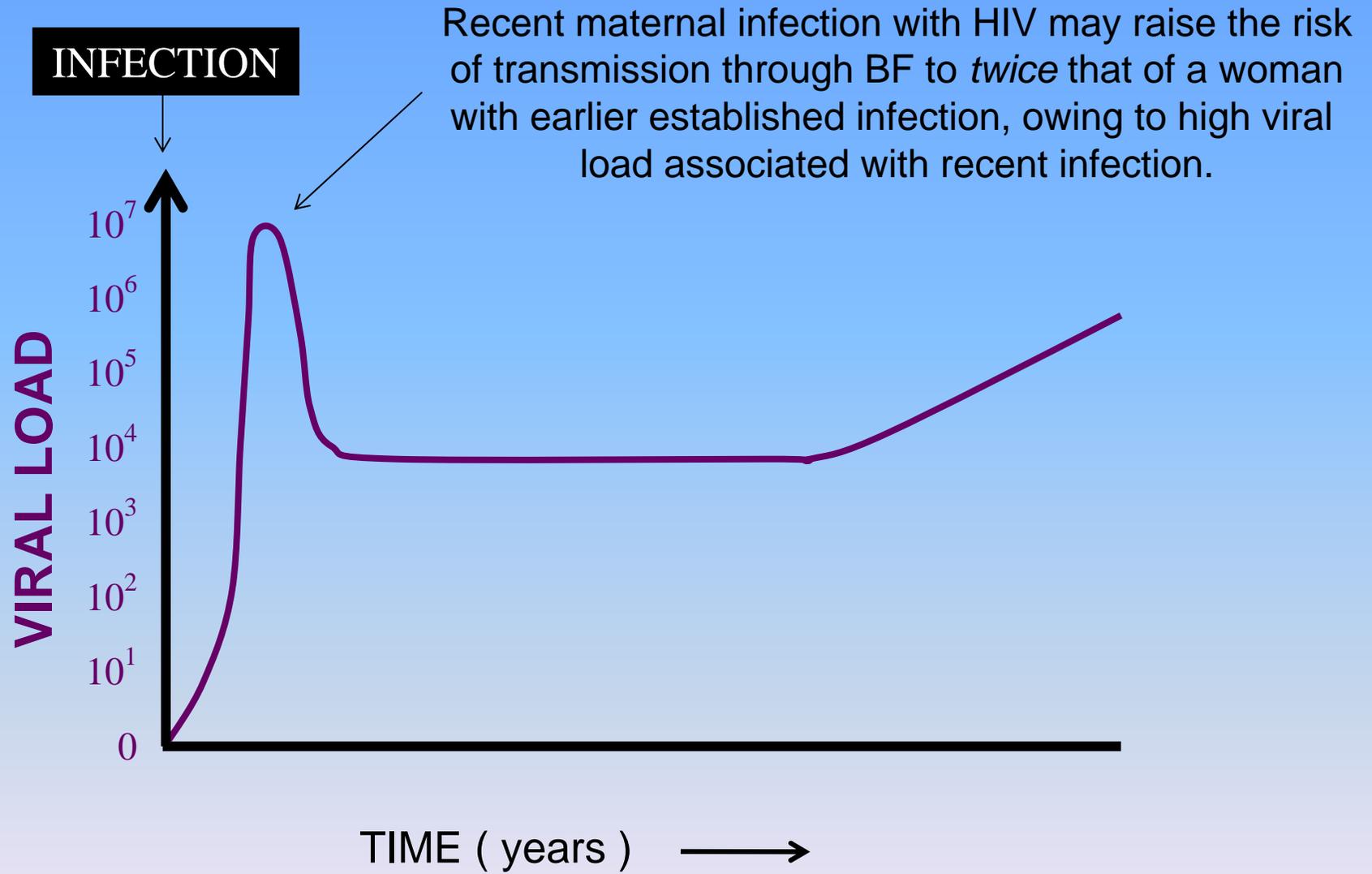
**Figure 1 Rate of Postnatal HIV Infection by Maternal Baseline CD4 Count: Zambia
Exclusive Breastfeeding Study (N=958)**



ICAP Clinical Unit Technical Update Sept 2007 – *HIV and infants feeding – ICAP approach to improving HIV-free survival*

HIV infectivity – more or less ?

- A high viral load during needle stick injury is **MORE** likely to lead to sero-conversion afterwards
- A high viral load during rape is **MORE** likely to lead to sero-conversion afterwards
- A high viral load during pregnancy is **MORE** likely to lead to sero-conversion afterwards
- A high viral load during breast-feeding **MORE** likely to lead to sero-conversion afterwards



Basic facts and child survival

- malnutrition is the underlying cause of death in about 60% of children < 5 years (50% of children in Africa)
- being underweight was associated with 3.7 million deaths worldwide in 2000, most in children < 5 years
- poor feeding practices (insuff. nutrition or contributing to diarrhoea) is a major cause of low weight, morbidity and mortality in children

BF and risk of HIV transmission

- BF protects infants from:
 - malnutrition, atopic eczema
 - common infections such as diarrhoea, pneumonia, neonatal sepsis, acute otitis media
- mortality from these conditions is common in developed countries, where babies are not BF in first 2 months of life experience a 6-fold increase in death rate
- BF provides optimal nutrition for an infant – it is safe, economical and fulfils the infant's total nutritional needs for the first 6 months of life

BF and risk of transmission

- an HIV-infected mother who BF has 4 to 16% chance of transmitting the virus to the child (depends of duration and type of feeding)
- in rural KZN, HIV prevalence in newborns ↑ from 14% at 6 weeks to 24% at 3 to 6 months in mixed feeding population
- exclusively BF infants transmission rate of 2 – 4% has been recorded at 6 months

Tuberculosis and Breast-feeding

- a woman who is BF and has TB *must* receive a full course of TB treatment
- correct *duration* and *drugs* will ensure prevention of transmission of tubercle bacilli to the baby
- *all* drugs are compatible and a woman can safely continue to BF her baby

streptomycin - lactation: oral absorption poor, *safe* SAMF 8th Ed, p.309

Tuberculosis and Breast-feeding

- if the mother is infectious (both smear-positive and smear-negative PTB), the child should be given prophylactic isoniazid (INH) 10mg/kg/day for 6 months and *continue* breastfeeding
- BCG vaccinations# should be *postponed* until the end of INH prophylaxis as the TB treatment and INH can destroy the vaccine

NDOH - Draft National Tuberculosis Policy Guidelines – 2008 p. 53

Mode of transmission

- virus is present in cell-associated and cell-free component of breastmilk
- direct viral invasion of the infant's gastrointestinal cells may alter the permeability of the child's gastrointestinal tract (Vitamin A deficiency contributes to poor epithelial repair)
- *mixed* feeds present the immature GIT with a variety of bacterial and food antigens → inflammatory activity promotes viral penetration and HIV entry into the infant's immune (gastrointestinal lymphatic) system

Breast feeding

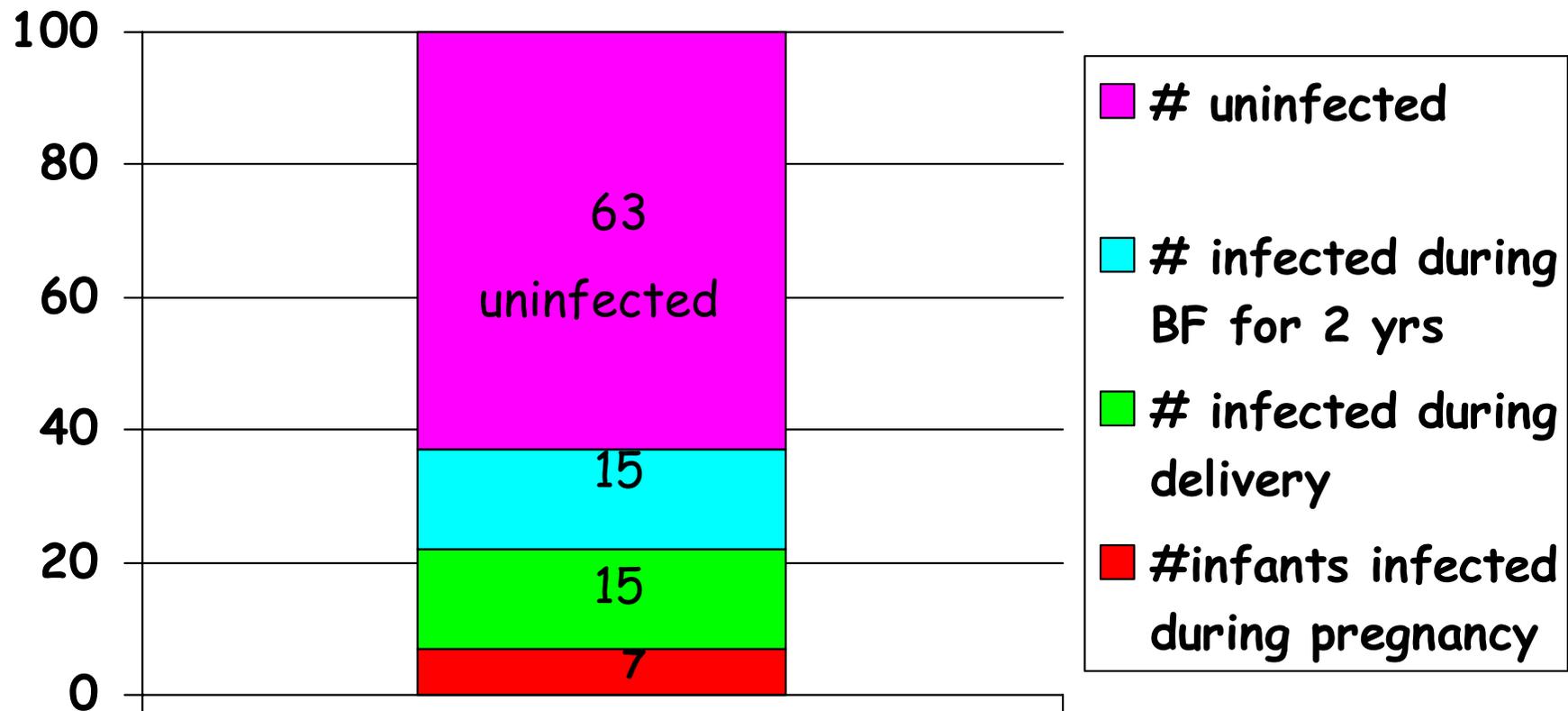
- continued BF is common in SSA
- 94% of infants in the *world* are ever BF
- 79% continue for 1 year
- 52% at *two years*
- average duration of 21 months
- 41% of infants under 4 months
- 25% of infants under 6 months
- in SSA, 23% of infants < 6 months are exclusively BF

can double the risk of HIV Tx to 40%

(25 to 40)

EXCLUSIVELY
breast fed

MTCT in 100 HIV+ Mothers by Timing of Transmission (Estimates)



INP, MRC, UWC, TBH, 2006

Mode of transmission

- mixed feeding is also associated with sub-clinical mastitis and with increased viral concentrations in breastmilk
- *EBF* may present the infant GIT with less inflammatory stress and less opportunity for viral transmission
- exclusive BF reduces the transmission risk compared to mixed feeding by about half

Choice - BF or FF ?

IMR = Infant Mortality Rate

- Public Health authorities recommendations based on IMR
- IMR different in each SA Province
- $IMR < 25 / 1000$ live births \rightarrow FF
- $IMR > 25 / 1000$ live births \rightarrow EBF



Southern African Journal of HIV
Medicine, Summer 2008



Infant and Young Child Feeding Policy – 2008

www.doh.gov.za

- *Baby Friendly Hospital Initiative* (BFHI) was launched globally in 1991
- appropriate feeding practices are essential for optimal nutritional status, growth, development and survival of infants and young children
- More than HALF of the deaths amongst CU5 are ass. with malnutrition or lack of optimal BF

THE BABY FRIENDLY PROCESS

In 1989, a joint statement entitled Protecting, Promoting and Supporting Breastfeeding: the special role of maternity services, was published by the World Health Assembly and the United Nations Children Fund. The aim of this statement was to increase awareness of the critical role of health services in the promoting of breastfeeding, and to give guidelines for appropriate information and support to mothers. In this statement, the Ten Steps to Successful Breastfeeding were introduced. The Baby Friendly Hospital Initiative was launched world wide in 1992 in an effort to encourage the implementation of these Ten Steps.

The Ten Steps To Successful Breastfeeding

Every facility providing maternity services and care for newborn infants should:-

1. Have a written breastfeeding policy that is routinely communicated to all health care staff
2. Train all health care staff about the benefits and management of breastfeeding
3. Inform all pregnant women about the benefits and management of breastfeeding
4. Help mothers initiate breastfeeding within half an hour of birth
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants
6. Give newborn infants no milk feeds or water other than breastmilk, unless indicated for medical reason
7. Allow mothers and infants to remain together 24 hours a day from birth
8. Encourage natural breastfeeding frequently and on demand
9. Do not give, or encourage, the use of artificial teats or dummies. Do not encourage the use of nipple shields either

10. Promote the establishment of breastfeeding support groups and refer mothers to these on discharge from the hospital or clinic

Basic Principle

- The Ten Steps to Successful Breastfeeding are non negotiable. Together they are the minimum package of hospital and maternity facility practices required to the Baby Friendly.
- The Global Criteria for the WHO/UNICEF BFHI establish a measurable standard for each of the Ten Steps.
- The Guide for Scoring the Global Hospital Assessment Questionnaire specifies the percentage of success required to adequately fulfill each of the ten Steps. To be designated Baby Friendly, a facility must satisfy the requirements of each step

HIV/AIDS



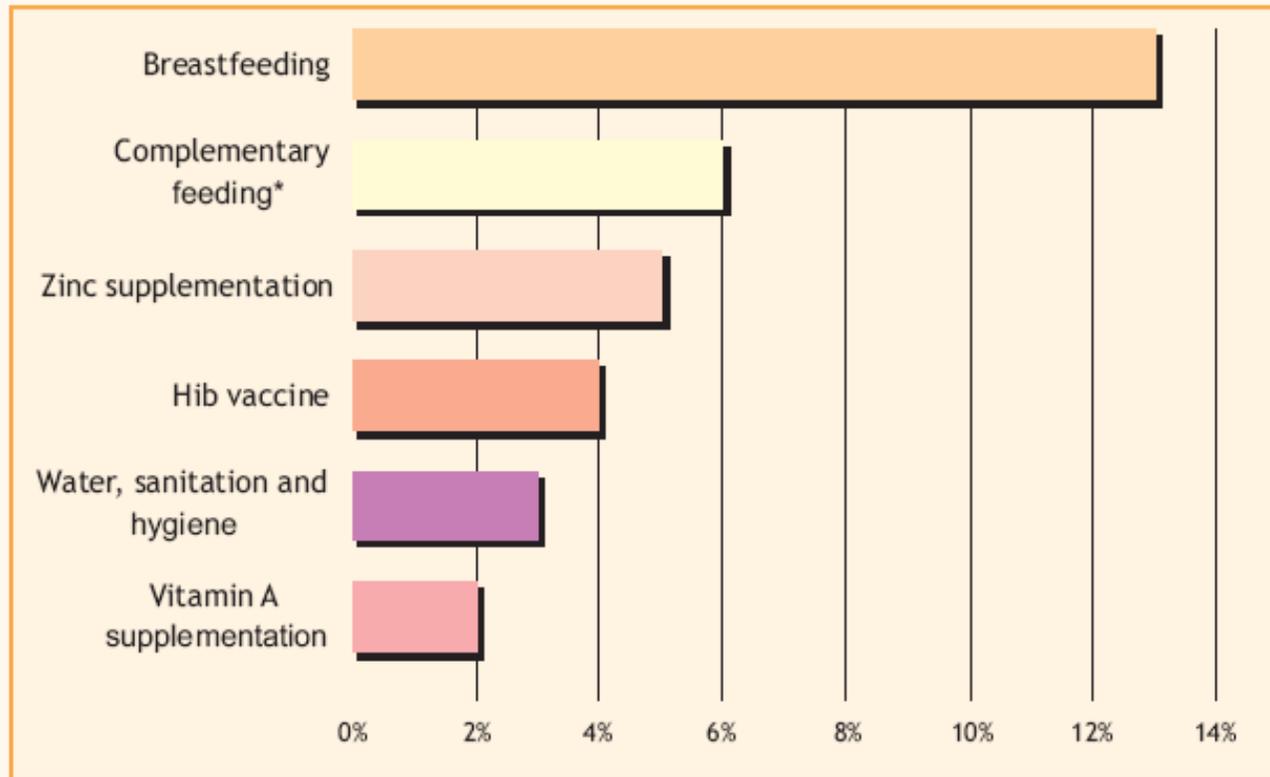
PMTCT

Given the possibility of vertical transmission of HIV via breastmilk, the question arises as to whether it is necessary or valid to continue to promote BFHI and breastfeeding. Scientific evidence suggests that breastfeeding increases the risk of mother to child transmission (MTCT) by 12 to 43%. MTCT from breastfeeding can occur anytime during the feeding and the longer the breastfeeding period, the more chance there is of MTCT. The type of feeding also increases the risk of MTCT. Mixed feeding, which involves giving the baby any other food or drink whilst breastfeeding increases the risk of MTCT by 50%. The policy on PMTCT therefore is seen as part of the Ten Steps and is included under Step 6.



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Figure 1: Estimated percentage of preventable death for different preventive interventions [12]



* Complementary feeding with continued breastfeeding

Note: If mother opts to breast feed, then Vitamin A supplementation should be given at 6 months, and at 6 weeks if she opts to use formula feed (EC).

HIV and child survival

- recent evidence from a large cohort in KZN
- asses HIV Tx risks and survival with EBF and other types of infant feeding
- 14 weeks age FF + BF twice as likely to be infected than EBF
- early introduction of solid foods to BF → 11 times risk of acquiring HIV infection

Hoosen MC, Rollins NC, Bland RM et al MTCT of HIV-1 infection during EBF in the first 6 mths of life: an intervention cohort study, *Lancet* 2007; 369

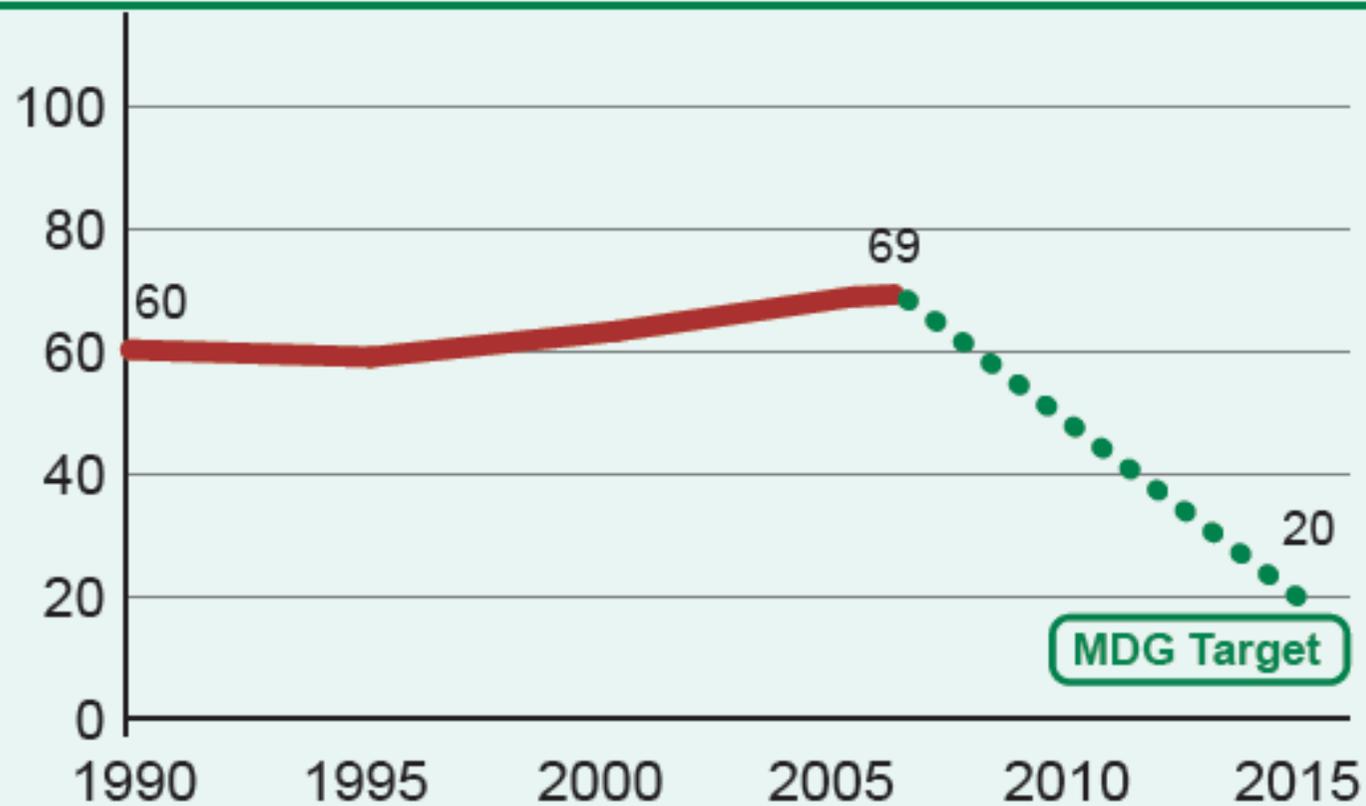
Infant feeding

Data from National Food Consumption Survey
2000

- offer pregnant women a *full package* of child survival interventions and not only the avoidance of HIV transmission
- *food insecurity* was experienced in 2/3 households, 5/10 individuals and 4/10 children nationally
- need to *standardise* messages about nutrition
- avoid *spill over* (misinformation, unfounded fears → ↓ BF)

Under-five mortality rate

Deaths per 1000 live births



Source: UNICEF, 2006

TABLE 4.II. RISK FACTORS FOR THE TRANSMISSION OF HIV THROUGH BREASTFEEDING⁴¹

Strong evidence	Limited evidence
High plasma viral load	High breastmilk viral load
Advanced disease/ low CD4 count	Sub-clinical mastitis as evidenced by increased breastmilk sodium levels
Breast pathology – mastitis, abscesses, cracked bleeding nipples	Low maternal levels of vitamins B, C, E
Primary infection/new infection: high plasma viral load	
Prolonged duration of breastfeeding (>6 mo.)	
Non-exclusive breastfeeding, mixed feeding and oral lesions ⁵⁵	

THE SOUTHERN AFRICAN JOURNAL OF HIV MEDICINE ————— SUMMER 2008

Note: Mastitis and sub-clinical mastitis have been associated with HIV transmission

Sub-clinical mastitis is more common than mastitis. It is not an infective process. It may occur with milk stasis and engorgement of the breasts. It is more likely to occur :

- when the milk first comes in after birth
- when there is inadequate milk drainage eg mixed feeding
- when there is poor attachment / less vigorous suckling by ill infant
- during rapid weaning

It causes an increase in the 'leakiness' in the cell lining the breast duct and therefore an increased in the amount of virus the infant is exposed to.

Timing to postnatal HIV transmission

- highest risk is 1st weeks of life
- by 3 – 6 months risk 4% 0.8 – 1.2 per month
- 75% of all BF transmission occurred by 6 months
- cumulative probability of becoming infected after:
 - 1.6% at 4 weeks
 - 4.2% at 6 months
 - 7% at 12 months
 - 9.3% at 18 months

TABLE 4.III. WORLD HEALTH ORGANIZATION 2006 BREASTFEEDING RECOMMENDATIONS⁴³

- The most appropriate infant feeding option will depend upon the mother's circumstances but ought to consider local health care services, counselling and practical support available to the mother.
- Exclusive breastfeeding is recommended for HIV-infected women for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS criteria).
- At 6 months, if replacement feeding still does not satisfy AFASS criteria, breastfeeding must continue with the addition of complementary feeds. The mother and baby must be regularly assessed. All breastfeeding must stop once a nutritionally adequate and safe diet without breastmilk can be provided.
- Whatever the decision, health services must continue to follow up and support women and HIV-exposed infants offering counselling and assistance when feeding decisions are being reconsidered.
- Breastfeeding mothers and infants who are known to be HIV-positive should be encouraged to continue to breastfeed.
- Governments and other stakeholders are encouraged to revitalise breastfeeding protection, promotion and support. They are asked to actively support women who choose to exclusively breastfeed and to ensure that replacement feeding is safer for women who choose that option.
- National health programmes are asked to provide all HIV-exposed infants and their mothers with a total package of interventions that will promote survival and the prevention of transmission. Those women in the antenatal clinic who test HIV negative ought also to have access to primary prevention programmes for themselves and their infant.
- Governments are urged to ensure that all the above interventions, including those dealing with exclusive breastfeeding, are available before distribution of free commercial infant formula is considered.
- Governments and donors are requested to increase their commitment and resources to ensure the implementation of the Global Strategy for Infant and Young Child Feeding and the UN HIV and Infant Feeding Framework for Priority Action in order to prevent postnatal HIV transmission, improve HIV-free survival and achieve relevant UNGASS goals.

Commercial infant formula

- no risk of HIV transmission
- other family members can help her feed
- if mother falls ill, others can feed her infant while she recovers
- contains most of the nutrients needed especially for infants but no protective antibodies
- *cup feeding* should be encouraged



Commercial infant formula

400g per tin

TABLE 4.IV. AMOUNTS FOR INFANT FEEDING UNTIL 6 MONTHS OF AGE

Age of infant	Milk feed		No. of feeds per 24 hours	No. of tins required for 1 infant per month (varies with the individual)
	Previously boiled water	No. of scoops		
1 - 2 wks	100 ml	4	6	7 tins
3 - 4 wks	125 ml	5	5	7 tins
2nd mo.	150 ml	6	5	9 tins
3 - 4 mo.	175 ml	7	5	10 tins
5 - 6 mo.	200 ml	8	4	9 tins

1 scoop = 25 ml

Pellargon NAN

Reconstituted FF and expressed BM are stable for 12 hours in fridge

0 - 6 mths needs 20kg
6 - 12 mths needs 16kg

HIV & infant feeding WHO p54

Southern African Journal of HIV
Medicine, Summer 2008



Department of Health
Integrated Nutrition Programme



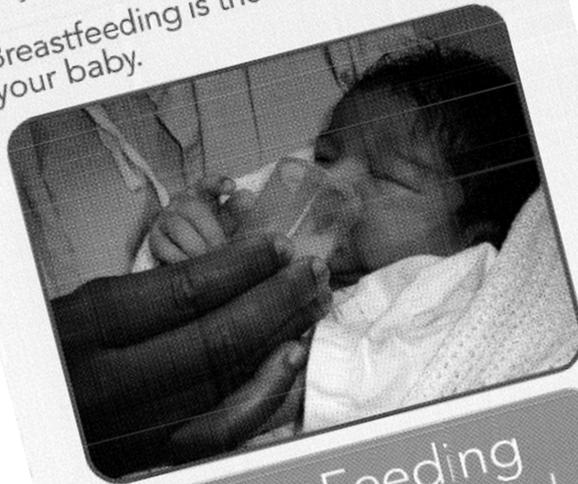
Cup Feeding



Breastmilk is
always the
best food
for babies

Babies do not need other food until
they are about six months old.

Breastfeeding is the best way to feed
your baby.



Cup Feeding
the best alternative !

DoH Integrated Nutrition
Programme

If you are unable to breast feed your baby, cup feeding is the best alternative because:

- Even small premature babies can cup feed
- It uses up very little of the baby's energy
- It is easy for anyone to learn how to do it
- It's hygienic as cups are easily cleaned.
- Mothers milk can be easily expressed into the cup.
- It's safer as the baby is being held and watched while drinking
- It involves the same tongue movement as breastfeeding so when the time is right, baby can easily start breastfeeding.
- Baby drinks at his/ her own pace and controls his/ her own milk intake
- It is affordable - you can use any cup (a small one is best).



Why is Cup feeding better than bottle feeding ?

- 1. HYGIENE**
The simple shape of a cup is easy to clean with soap and water.

Cups do not encourage left overs to be stored.

Bottles and teats are difficult to clean and sterilise.

Feeding bottles are a major cause of infant diarrhoea. If bottles are prepared in advance and stored incorrectly it may increase the chance of a baby becoming ill.
- 2. SUCKLING**
A cup does not interfere with the way a baby attaches to and suckles at the breast.

Bottles may teach a baby to suck in a way that makes them unwilling to breastfeed.
- 3. CONTACT WITH MOTHER**
The baby has to be awake and is held in the mother's arms during feeds.

The baby is often propped up with a bottle and left alone during feeds.
- 4. SAFETY**
The baby is constantly watched.

Many babies are left alone with their bottles - this can lead to choking.
- 5. TIME**
Although the baby feeds at his own pace, it is usually quicker.

Bottle feeding is usually slower.



Department of Health
Integrated Nutrition Programme



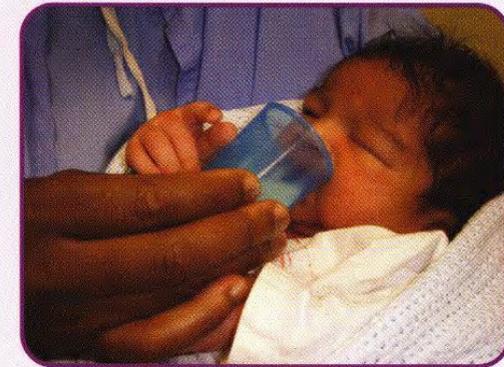
Cup Feeding



Breastmilk is always the best food for babies

Babies do not need other food until they are about six months old.

Breastfeeding is the best way to feed your baby.



Cup Feeding
the best alternative !

How to feed your baby with a cup



All babies can be fed with a cup, even babies that are born too small or too soon.

- Your baby must be awake
- Sit your baby on your lap if necessary wrap the arms so that your baby cannot bump the cup
- Support your baby's head
- The cup must be at least half filled with milk

Cup feeding is much safer than bottle feeding



- Bring the cup to your baby's lips
- When baby opens the mouth, tilt the cup
- The cup must rest lightly on the lower lip
- DO NOT POUR the milk into baby's mouth
- Your baby will sip the milk from the cup



- Your baby needs to rest between sips
- When your baby has had enough baby will refuse to drink any more
- Take note of how much breastmilk your baby drinks in a whole day and not at one feed.



IMPORTANT

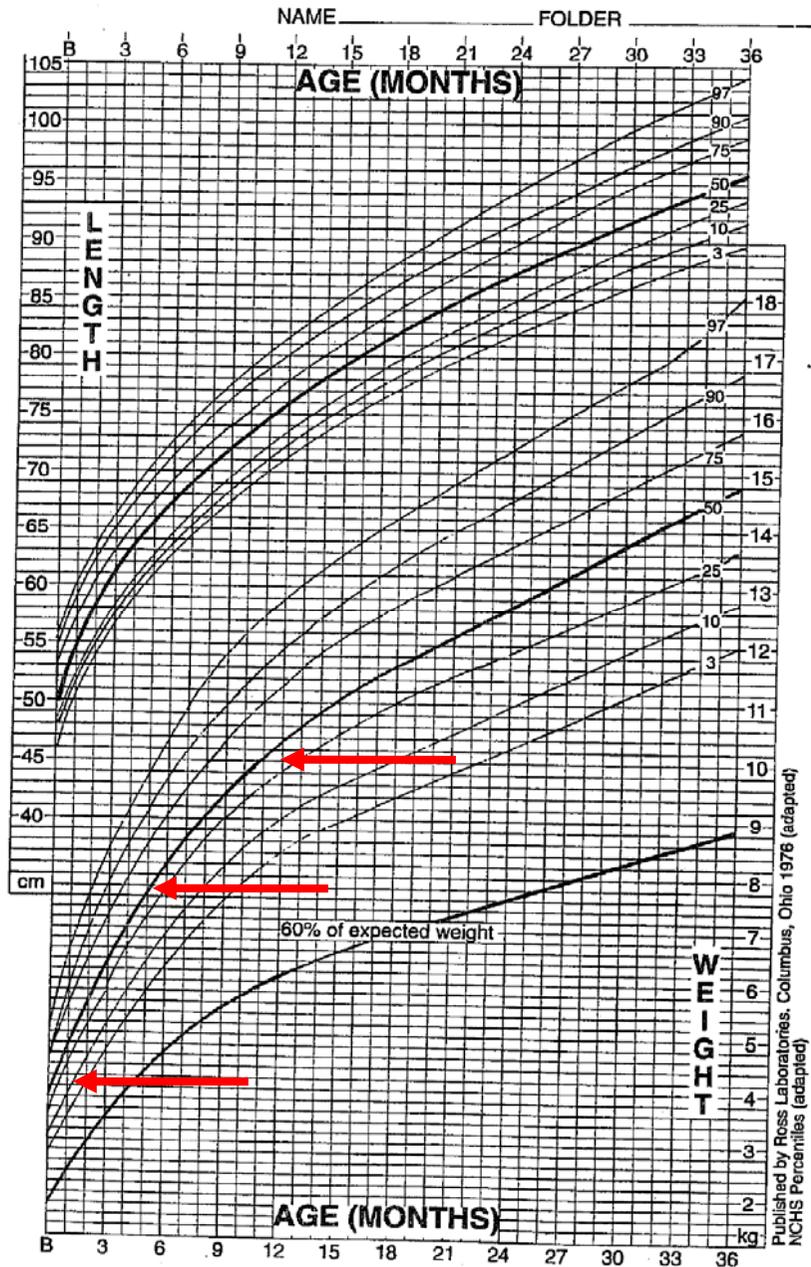
Ideally breastfeeding is best for babies, but at times when it is not possible Cup feeding is the best and safest alternative.

Infant growth

- advise women that FF will only be provided for 6 months grow
- volume of infant's feeds increase as their weight increases
- infants grow fastest in the *first two years* of life
- on average, double their birth weight by 5 months and triple it by one year of age

BOYS: BIRTH TO 36 MONTHS

PD188L



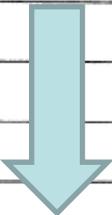
GROWTH CHARTS

Triple weight by one year (10Kg)

Double birth weight by 5 months

Birth weight 2.5 to 3.5 kg

A guide to the provision of Nan Perlagon (400g) to PMTCT programme participants for 6 months only

Age in months	For infants who will be exclusively breast fed from birth to 6 months	For infants who will be exclusively Formula fed from birth	
1		5 tins	
2	EXCLUSIVE	8	
3		9	
4	BREASTFEEDING	9	
5		10	
6		10	
7	8 tins	Participant to purchase	
8	8		
9	8	formula	
10	8		
11	8		
12	8		
Total provision for child	48 tins	51 tins	

“Spillover” effect

- feeding behaviour of new mothers who either know that they are HIV negative or unaware of their status
- they choose not to breast feed or breast feed for a short time because of unfounded fears about HIV or ready availability of breast-milk substitutes



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Feeding choice : follow-up

- there may be some mothers whose circumstances change during the first 6 months of their babies' lives such that they can safely change to FF if replacement feeding becomes AFASS or mother has insufficient milk
- regular REVIEW and SUPPORT of mother after deliver essential

Note: An HIV infected mother whose infant tests HIV negative at 6 weeks may want to STOP BF – carefully check her AFASS criteria

Breast milk pasteurisation

- Golden standard – hospital milk bank – heats breast milk to 65° C for 30 minutes and allow to cool

OR

- *Pretoria Pasteurisation* – home use

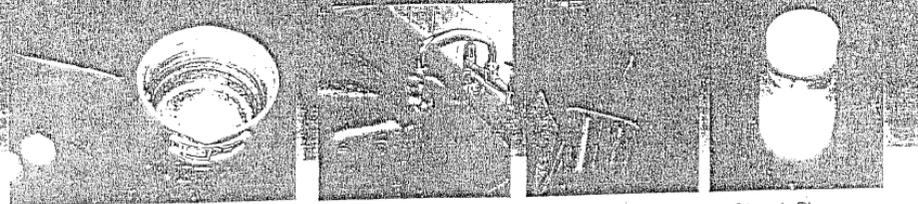
(Flash heat treatment the breast milk)

CONSIDER heat treated BM if newborn hospitalised or immediately after normal birth if mother undecided or during transition from BM to FF

PRETORIA PASTEURISATION

Institutional Guidelines for the Procedure of Pasteurising Mother's Breast Milk for Own Infant Feeding Twelve steps to Pasteurisation

B Jeffery, RK Mokhondo, AE Pullen & RC Pattinson

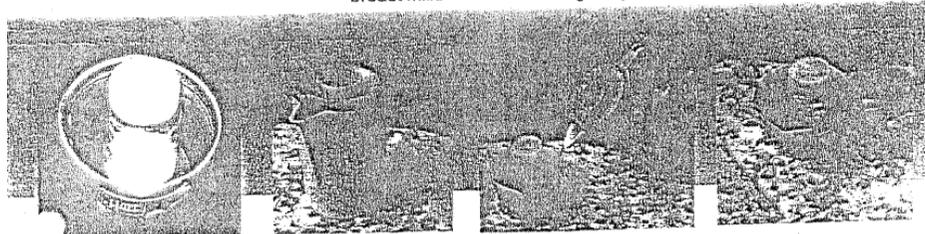


Step 1: Use only a 1 liter hart aluminum pot. Make a mark on the inside of the pot 1 cm from the top.

Step 2: Mother washes hands with soap and water before expressing breast milk.

Step 3: Express breast milk into a clean container or glass jar.

Step 4: Place breast milk in glass jar and put the lid on.

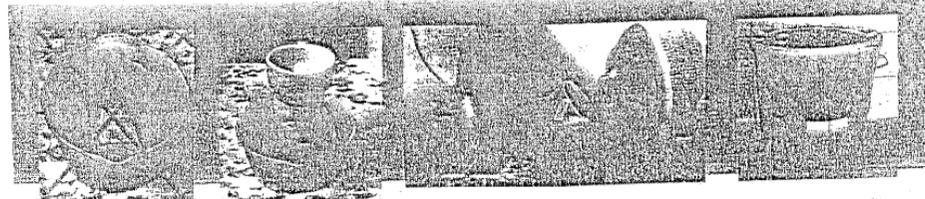


Step 5: The glass jar containing the breast milk is placed into the aluminum pot.

Step 6: Boil water. When the water is bubbling vigorously the water is poured into the pot.

Step 7: Pour boiling water into the pot up to the mark.

Step 8: Leave milk in pot for 25-30 minutes, until the water is comfortable to touch.



Step 9: If there is only a small volume of milk in the jar, the jar may tend to float. This must be avoided!!

Step 10: To prevent the jar from floating, place a heavy object on the lid.

Step 11: The jar is removed from the water and baby is spoon-fed, cup-fed or tube-fed. Pasteurised breast milk can be stored in a fridge for 12 hours, and thereafter discarded.

Step 12: Wash all jars with soap and water and place in bucket with sodium hypochlorite solution (8liters of water on 100ml of sodium hypochlorite). Change solution every 24 hours.

Pretoria Pasteurisation

Institutional Guidelines for the Procedure

- 12 steps for mother's milk for own infant feeding
8 litres + 100 ml sodium hypochlorite
- ensure jar sterile (water and *Jik*®)
- stand expressed breastmilk in a jar for 25 to 30 mins in boiled water, until the water is comfortable to the touch
- care must be taken to prevent the jar from tipping over
- can be stored in the fridge for 12 hours

Dispensing formula feed

- ensure *uninterrupted* supply
- ensure mixed *correctly*
- ensure *enough* supplied each month
- ensure *SIX* month supply
- ensure stock *ordered* timeously
- ensure secure & safe *storage* areas at clinic

Definitions

- *Exclusive breastfeeding* (EBF) = the mother breastfeeds her infant and NO other food or drink including water is provided (exception drops or syrups of vits, minerals, supplements or medications)

Commercial infant formula
or breast milk substitute

- *Replacement feeding* ("artificial feeding" is sometimes used as a synonym) = the mother does not breastfeed her infant; the child must receive appropriate breastmilk substitutes eg infant formula



Definitions

Not a choice; mothers do this by default

- *Mixed feeding* = the mother breastfeeds while also giving her infant water, tea, formula, animal milk or semi-solid food eg yoghurt, purees and/or solid food (includes partial and predominant BF)
 - also called predominant or partial breast feeding, associated with 3-4 fold ↑ risk vs. EBF
- *Early cessation of breastfeeding* = mother completely stops BF including suckling when infant 4 - 6 months age (early weaning is sometimes used as a synonym)



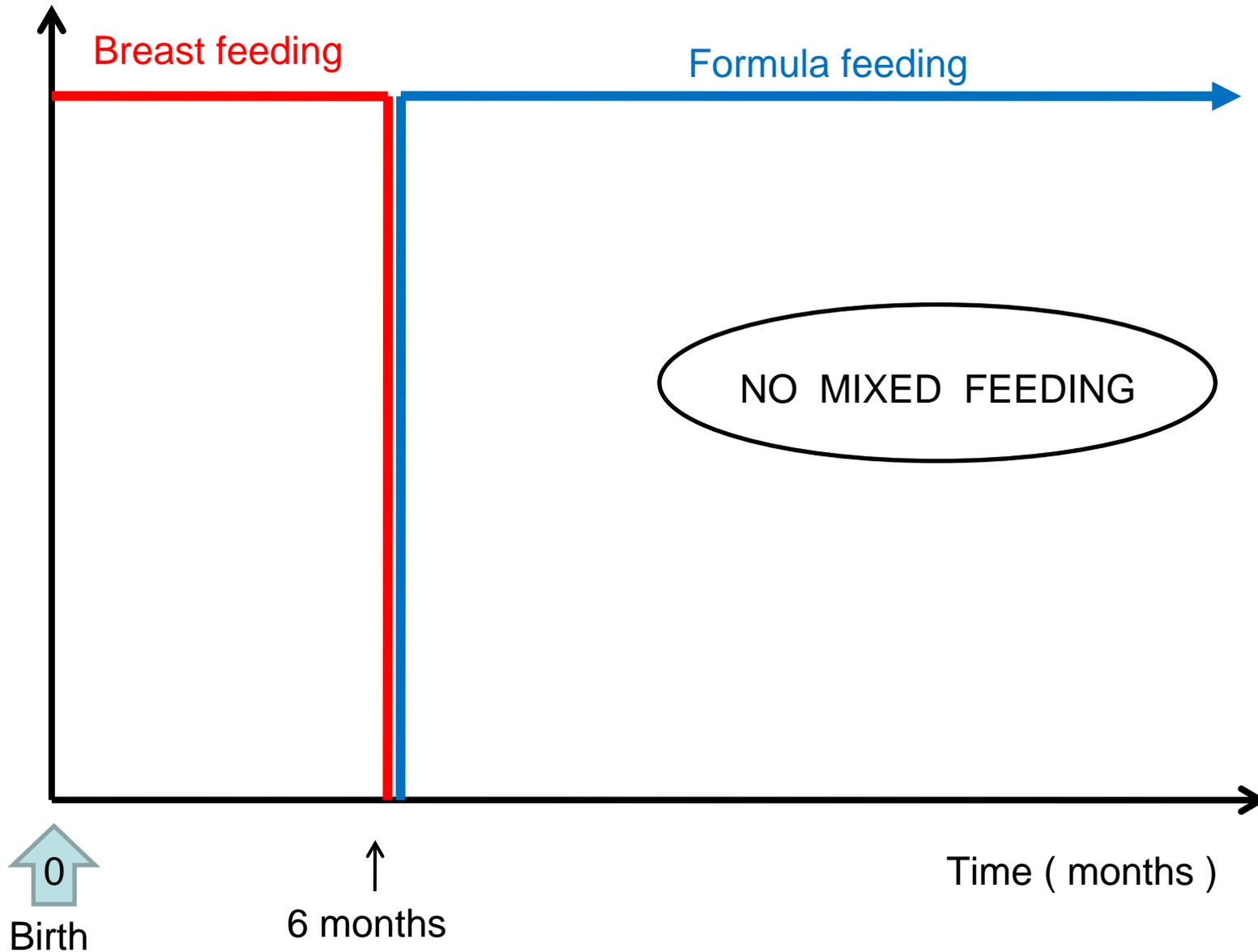
Definitions

- *Weaning* = transition after which all breastmilk is replaced by breast milk substitutes
- abrupt or rapid cessation is not recommended; has negative effects on infant and mother (breast pain and engorgement)
- duration 2- 3 days up to 2 to 3 weeks

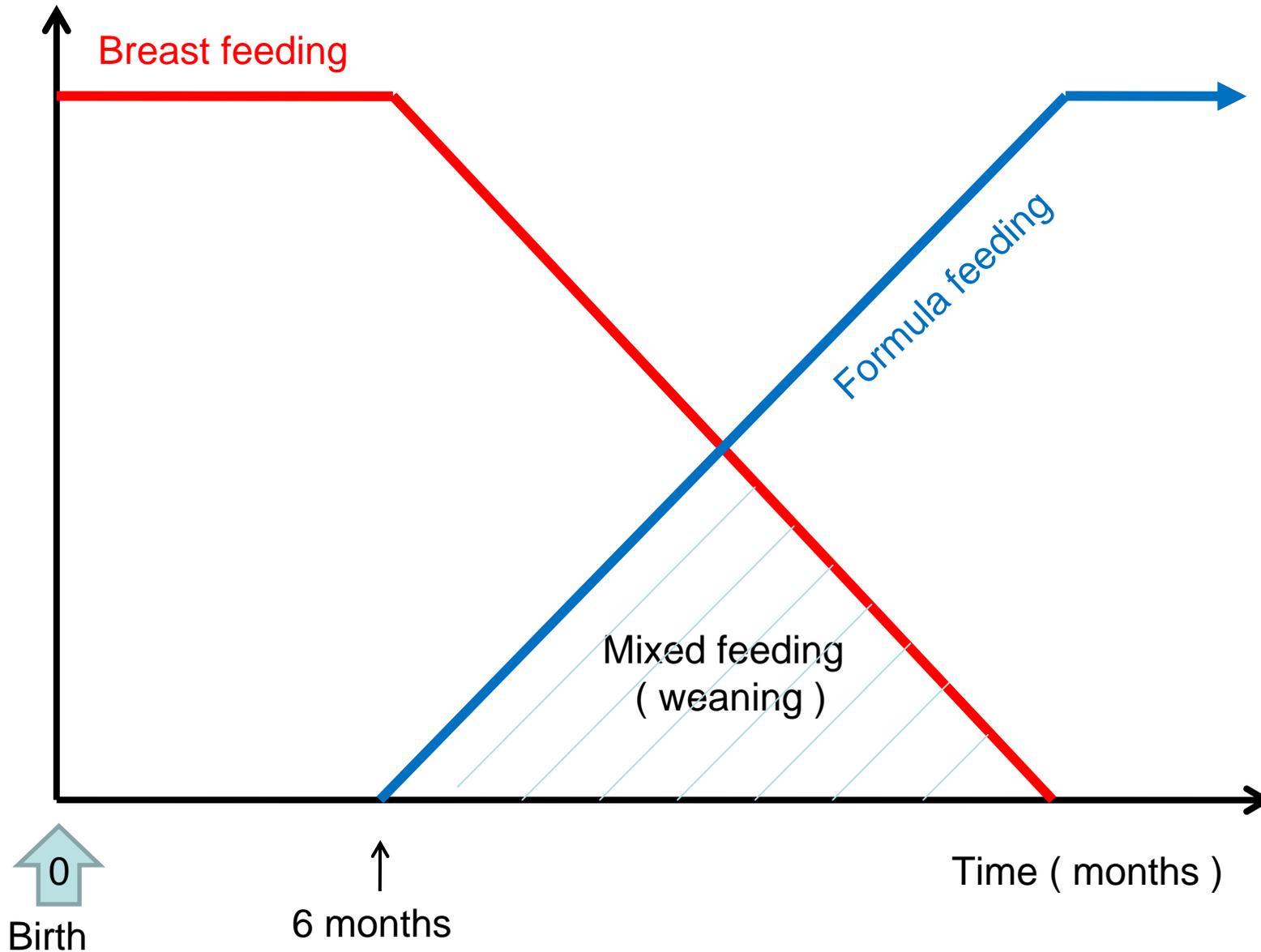
transition period BM to FF



Abrupt cessation of breast feeding



Weaning from breast



History of HIV and infant feeding

- 1985 – Australian doctors report the first case of an infant who became infected through breast milk
- 1987 – WHO advises BF where no safe alternative available
- 1989 – PCR becomes available to diagnose HIV in infants; transmission risk through BF reported to be “low”
- 1992 – WHO advises transmission rate $\pm 14\%$ from mothers infected before delivery and 29% from mothers infected after delivery

History of HIV and infant feeding

- 1997/8 – WHO publishes new feeding guidelines which advised all mothers to be counselled about feeding options; UNICEF begins PMTCT support and FF
- 1999 Dr Anna Coutsooudis (SA study) suggests EBF in first 3 months = FF; highest rate in mixed diet
- 2001 – WHO introduces “AFASS” criteria
- 2002 – UNICEF stops FF distribution
- 2005 Zimbabwe study confirms risks of mixed feeding

History of HIV and infant feeding

- 2007 – a study of nearly 3000 mothers in SA confirmed that mixed feeding carries a higher risk of HIV infection than EBF; suggest to WHO that infant feeding be revised in favour of EBF



AFAAS

- *Acceptable*= BF is the norm in most cultures, and is generally encouraged by health workers. By choosing not to BF, a mother risks revealing she is HIV+, and becoming a target for stigma and discrimination from her community. She must be able to cope with this problem and resist pressure from friends and relatives to BF. Mother sees NO barrier to BF and have no fear of repercussions.

AFAAS

- *Feasible* = a mother who chooses FF must have adequate *time, knowledge* (be able to follow instructions), *skills* and other *resources* to prepare the FF and feed her baby up to 8 or more times in 24 hours. Boiling water over a charcoal stove, for instance, can take \pm 15 minutes per feed (? constraints of her work and family schedule). Unless refrigerated, prepared FF becomes unsafe after 2 hours.

AFAAS

- *Affordable* = someone has to pay for ingredients, fuel, water and other equipment needed for the FF. An uninterrupted supply of FF is also needed to be collected from the clinic at regular intervals; she must be supported by the health system. FF must not compromise the family's finances with regard to nutrition and medical needs.

AFAAS

- *Sustainable* = feeding an infant for the first 6 months of life requires around 20kg of FF and regular access to water. Even a brief disruption in supplies can have serious health implications. Where the mother is absent, the caregiver must be able to prepare FF reliably.

CHOICE IMPORTANT

www.avert.org



© Impact Visuals / E. Miller
and Africa recovery, UN

Vulnerable infants

AFAAS

- *Safe* = FF should be nutritionally sound and free from bacteria. The water it is mixed with should be boiled, and utensils should be cleaned (preferably boiled) before each use. This means the mother must have access to storage facility, a reliable supply of safe water and fuel.
- of the 5, safety is the most critical.

REDUCING and MONITORING POSTNATAL HIV TRANSMISSION

Counsel on infant feeding options

ALL AFASS
criteria met

ALL AFASS criteria
NOT met

EFF

EBF

Early infant testing
At 6 weeks

If infant HIV negative, follow
AFASS criteria to determine
most appropriate feeding
method

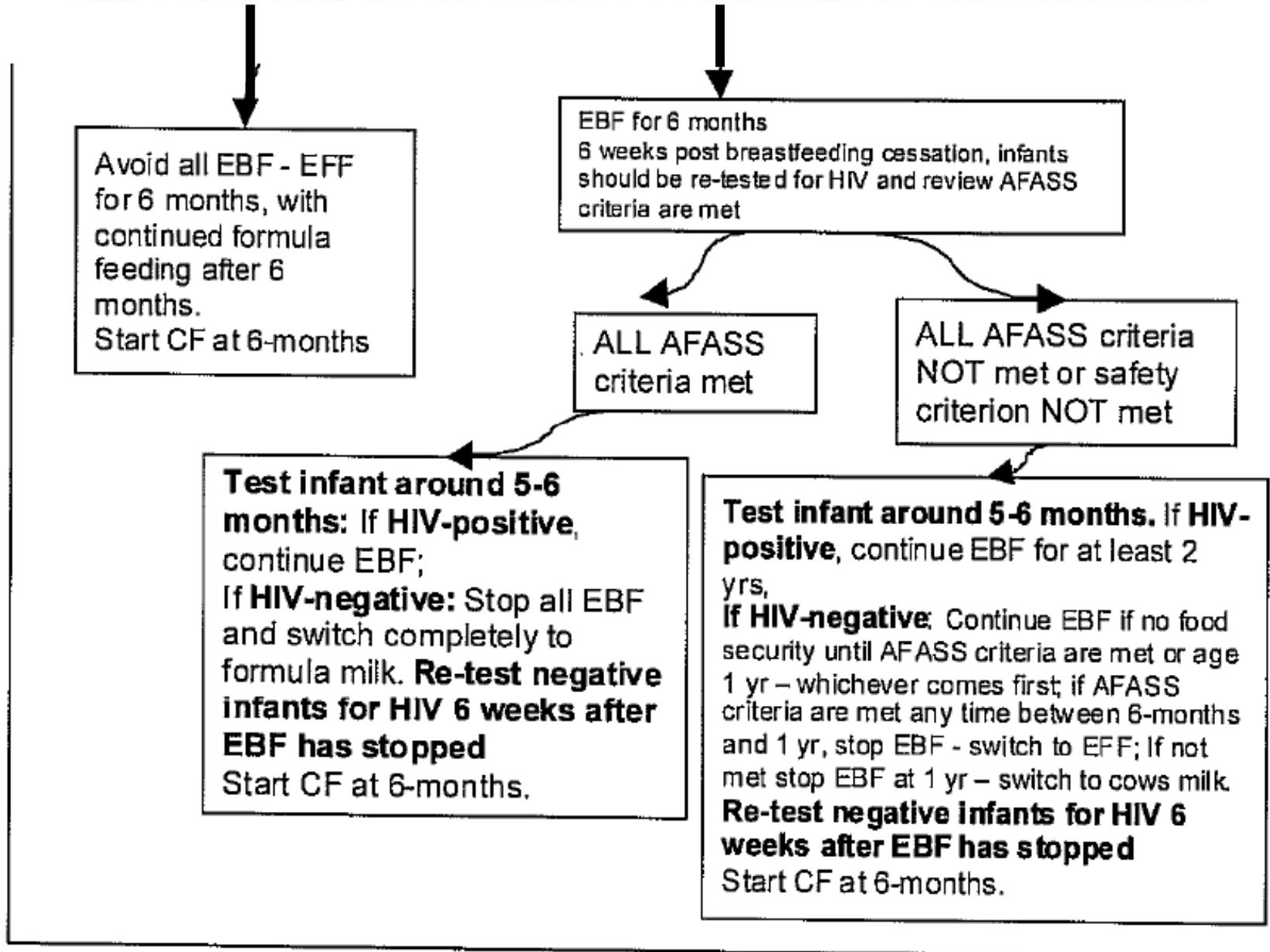
If infant HIV positive,
prompt referral
according to guidelines

ALL AFASS
criteria met

ALL AFASS criteria
NOT met

EBF for 6 months
with continued
EBF for at least 2
years

REDUCING AND MONITORING POSTNATAL HIV TRANSMISSION





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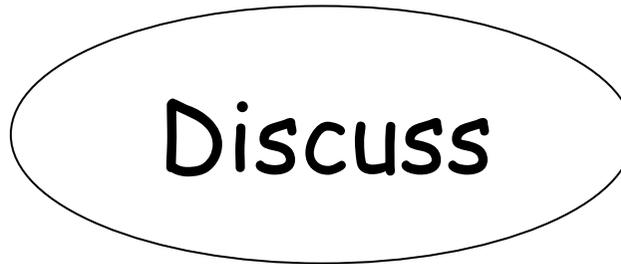
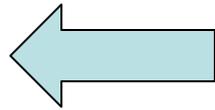
Table 2: Questions to establish if mother meets AFASS criteria

Question	Breastfeeding	Unclear	Replacement feeding
Where do you get your drinking water?	River/stream/pond or well	Public standpipe	Piped water at home
What kind of toilet do you have?	None or pit latrine	Ventilated improved pit latrine	Water borne latrine or flush toilet
Do you have money for transport to get formula?	No	Usually	Yes
Do you have a working refrigerator?	No	Yes usually	Yes
Can you prepare each feed with boiled water and clean utensils?	No	Yes but may be difficult	Yes
Does your family know you are HIV positive?	No	Some family members know	Yes
Do you have an additional R450 per month to buy formula if the facility does not have any	No	Sometimes	Yes

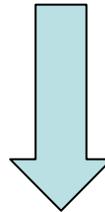
Source: Policy and guidelines for the implementation of the PMTCT Programme, NDoH 2008

AFASS criteria for Infant Feeding Choices

If most of the responses fall on the LEFT side, then FF may be best option



If most of the responses fall on the RIGHT side, then BF may be best option



Clarity

Counselling

Confusion

- *simplified* the counselling process into:
 - replacement feeding or
 - exclusive breast feeding
- *other* options that are only covered if the mother expresses interest are:
 - expression with heat treatment
 - breast-milk banks
 - wet-nursing

Note: Consistent messages needed and frequent, high quality counselling. Inaccurate, insufficient or non-existent counselling → wrong feeding choices

Counselling

- HIV infected mothers should ALL receive counselling about feeding choices
- good quality of counsellors essential to providing a good service
- adequate numbers of people who can counsel should be trained
- ? include ALL allied medical staff to *support* this programme

inclusion in PMTCT workshop & integrated approach



ICAP
International Center for AIDS
Care and Treatment Programs
MAILMAN SCHOOL OF PUBLIC HEALTH
Columbia University

Summary

Between 50-80% of postnatal transmission of HIV occurs in infants born to women with advanced disease (CD4<350).^{11, 12,30,33}

In resource-limited settings, use of replacement feeding has resulted in high rates of diarrheal diseases, malnutrition and increased mortality.^{12,23,24}

HIV-free survival is not improved by early weaning.^{12,23,27,28,29}



ICAP
International Center for AIDS
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MAILMAN SCHOOL OF PUBLIC HEALTH
Columbia University

Summary

Exclusive breastfeeding reduces HIV transmission compared to mixed feeding.
12,30,31,32,33,34

Counseling and support improves adherence to EBF. 12,42,43,44

Appropriate care should be provided to all postpartum mothers since neither breastfeeding or avoiding breastfeeding will protect them from disease progression. 46,47,48,49,50

Summary

The ICAP approach to improving HIV-free survival



creen pregnant and lactating HIV-infected women for treatment eligibility



reat pregnant and lactating HIV-infected women with advanced disease and low CD4



ctively support EBF for as long as possible until 6 months of life



omplementary feeds should be introduced at 6 months with continued breastfeeding



eepest mothers and infants engaged in care

Gaps in PMTCT

- HIV testing of newborns when the biological mother's status unknown or she declined PIT ?
administration of post-exposure prophylaxis without consent ?
- VCT counsellors must ensure HIV negative pregnant mothers **STAY** negative after PIT
very important to avoid HIV infection **DURING** pregnancy
- partners and in-laws awareness of HIV can support *exclusive* breast feeding practices
disclosure

Questions to be answered ?

- Can ARVs *reduce* the risk of postnatal HIV transmission through BF?
- Should these drugs be given to the *mother* or the *infant* or both ?
- What are the long term and short term consequences for the health of the baby of ARV use by either mother or baby ?
- What is the *long* term health impact for the mother of ARV use for PMTCT ?



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Drug monitoring

Drugs contraindicated in pregnancy

- Efavirenz for congenital abnormality.

Monitor for side effect of ARVs

- Stavudine for lactic acidosis. }
- Didanosine for lactic acidosis } Never combine
- Nevirapine for liver toxicity and rash
- Zidovudine for anaemia

Care of the Pregnant HIV-infected Woman and her Baby

Ante-partum Care:

Medication

Start from
28-32 weeks
or earlier
if indicated for
maternal reasons

Drugs that can be used:

NRTI: zidovudine (ZDV, AZT)

lamivudine (3TC)

NNRTI: nevirapine (NVP)

**PI's: ritonavir, nelfinavir,
saquinavir, lopinavir
(Kaletra)**

Public Health Service Task Force: accessed August 30th, 2002.

<http://www.hivatis.org>

SAFETY of EFV in pregnancy

- 4 (2.8%) birth defects of 142 live births following exposure to EFV based regimes in first trimester among pregnancies reported prospectively to an ARV pregnancy registry in US
- prevalence of birth defects = 3.1% based on surveillance data from CDC
- 3 retrospective case reports of NTDs

SAFETY of ARVs in pregnancy

- PIs do not provide prophylaxis to the foetus unlike AZT and NVP
- the major short term toxicity among infants exposed to prophylactic AZT is *anaemia*; usually mild and reversible after AZT stopped but more severe with longer exposure > 1 month; no congenital malformations with AZT reported
- in-utero exposure to *tenofovir* may result in abnormal bone development
- PI drugs do not cross the placenta

Safety – what and when ?

- Concerns:
 - health of HIV-infected women
 - side effects in mother
 - drugs harming baby
- if ARVs need to be stopped for any reason , ALL must be stopped simultaneously; do not reduce dosage or remove the one offending drug
- NVP and EFV have a *longer half life* than NRTI drugs → sub-therapeutic level of NVP detected up to 3 weeks after cessation - ? *need to cover “tail”*



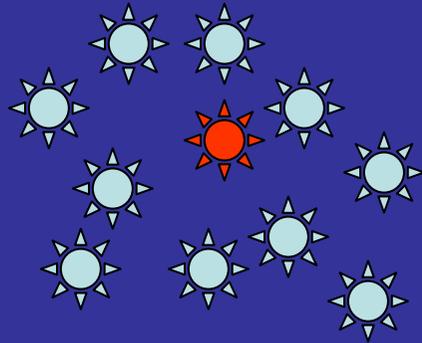
Resistance

- occurs more frequently with *single* and *dual* regimes
- a short course ARV prophylaxis may be associated with a *single* point mutation which can confer drug resistance eg NVP
- AZT requires *multiple* sequential mutations
- partly suppressive regimes favour replication of resistant virus over *wild-type* virus
- amount of virus containing mutations rises

Nevirapine resistance

- in a SA study, NVP resistance seen in only 25% one year after delivery
- but HIV DNA in the womens leucocytes did not show any evidence of NVP resistance
- this suggests archiving of NVP resistance mutations may be a rare event and re-emergence of (R) virus occurs infrequently

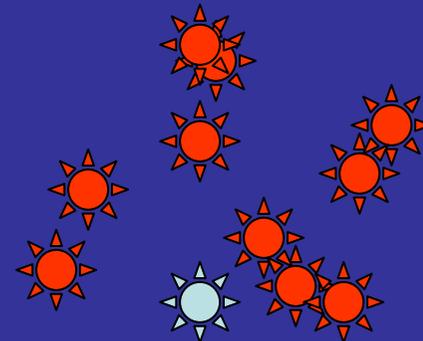
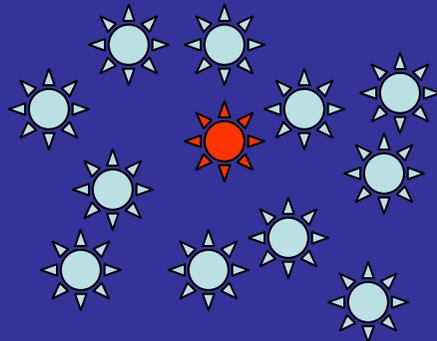
NVP and selection of NNRTI resistance



No drug



+ NVP

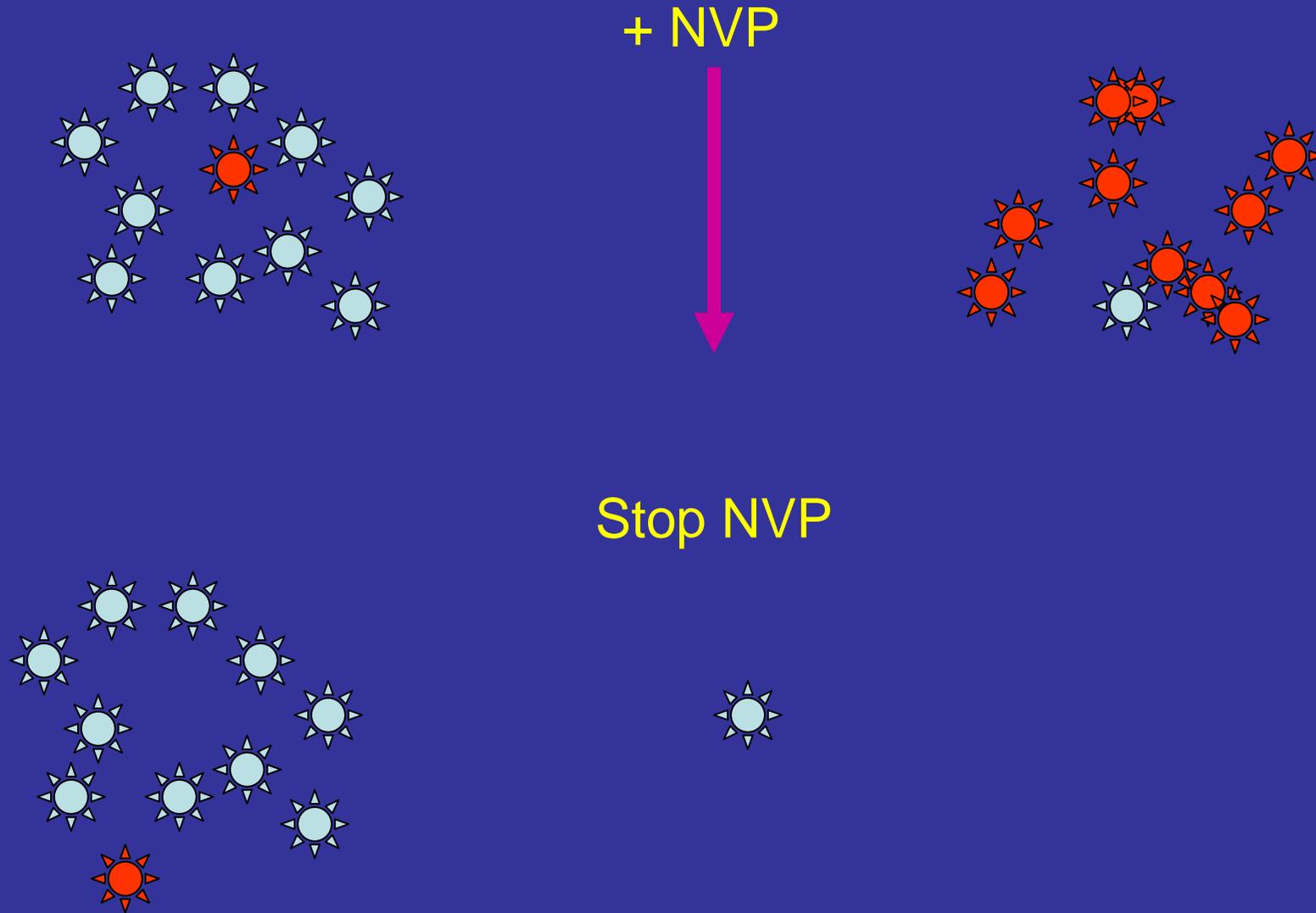


Response to ARV after a single dose of NVP*

- women who received a single dose of NVP to prevent perinatal transmission of HIV had higher rates of virological failure with subsequent NVP-based ARV's than women without prior exposure to NVP
- **HOWEVER**, this only applied when NVP-based ARV's was initiated within 6 months after receipt of a single peripartum dose of NVP

*NEJM 11 January 2007

NVP and “fading” of NNRTI resistance



Resistance

- after a drug is discontinued, the selective pressure is no longer present, the wild-type again becomes the predominant strain & resistant virus is no longer detectable
- a mother can receive triple therapy (HAART) provided it is started SIX months after cessation of PMTCT drugs

Adherence to ARVs during pregnancy

- morning sickness
 - gastro-intestinal upset
- } - nausea
- fears of harm to foetus

Note:

In South Africa, the subtype C virus is predominant.

Most rapid tests detect HIV-1 and HIV-2.

Risk of vertical MTCT for HIV-2 is much lower than than HIV-1.

Rates of MTCT of HIV-2 are between 0 – 4% among BF infants with no Intervention (NNRTI's are ineffective against HIV-2)

Malaria in HIV-infected women

Table I. The impact of HIV infection on clinical presentation, severity and adverse outcomes of malaria in adults, children and pregnant women in areas of stable and unstable malaria transmission

Patient group	Unstable transmission (non-immune)*	Stable transmission
Non-pregnant adults	<ul style="list-style-type: none">• Increased risk of severe malaria• Increased risk of death in rural areas	<ul style="list-style-type: none">• Increased risk of clinical malaria (including fever)• Increased parasite density• Increased risk of clinical treatment failure (re-infection)
Children	<ul style="list-style-type: none">• Increased risk of severe malaria	<ul style="list-style-type: none">• Increased risk of death and re-admission for malaria
Pregnant women	<ul style="list-style-type: none">• No data but increased risk of severe malaria likely	<ul style="list-style-type: none">• Increased risk of malaria infection• Increased risk of placental malaria• Higher parasite density• Increased risk of anaemia• Decreased response to antimalarial therapy• Loss of gravidity-dependent immunity• Increased risk of low birthweight, preterm birth, intra-uterine growth retardation and higher postnatal infant mortality rate

*Risks to travellers are thought to be similar to those described in individuals from areas of unstable malaria transmission.

Table I. Choosing the appropriate chemoprophylaxis

Factor	Mefloquine	Doxycycline	Atovaquone-proguanil
Malaria risk area	Resistance in some areas of SE Asia	Recommended for all areas	Recommended for all areas
Length of time	Best evidence for long-term use. Has been used safely for 3 years ⁶	Has been used safely for up to 2 years ⁶	Best used for short-term travel, but no evidence of harm from long-term use ⁶
Children	Use from 3 months of age (>5 kg) ¹	Contraindicated in children <8 years of age ⁷	Not to be used in children weighing <40 kg*
Pregnant women (should preferably avoid travel to malaria areas)	Recommended by the WHO from the second trimester ¹¹	Contraindicated	Contraindicated because of lack of data ⁶
Concurrent medication	See article on drug interactions		
Other contraindications	Depression, epilepsy, neuropsychiatric illness, or any history thereof	Breastfeeding	Breastfeeding, severe renal impairment (creatinine clearance of <30 ml/min) ^{9,12}
Dosage interval	Once weekly	Daily dose	Daily dose
Time needed before entering malaria area	At least 1 week; for first-time use: 2 - 3 weeks ⁺	24 - 48 hours	24 - 48 hours
Duration of prophylaxis	Continue while in and for 4 weeks after leaving malaria area	Continue while in and for 4 weeks after leaving malaria area	Continue while in and for 7 days after leaving malaria area
Special precautions	Use with caution in travellers requiring fine motor co-ordination ⁶	Avoid excessive exposure to the sun. Take after a meal with a full glass of water and do not lie down for 1 hour thereafter	Take with milk or food for better absorption ⁹
Most common side-effects	Nausea, strange dreams, dizziness, mood changes, insomnia, headache and diarrhoea	Skin photosensitivity, oesophageal ulceration, gastrointestinal symptoms, candidiasis	Well tolerated. Headache and abdominal pain most frequent adverse effects ^{9,12}

* Paediatric tablets of atovaquone-proguanil (for children weighing 11 - 39 kg) are not yet registered in South Africa.

⁺ To ensure that protective levels have been reached and to give enough time to change to a different drug if adverse reactions have developed.



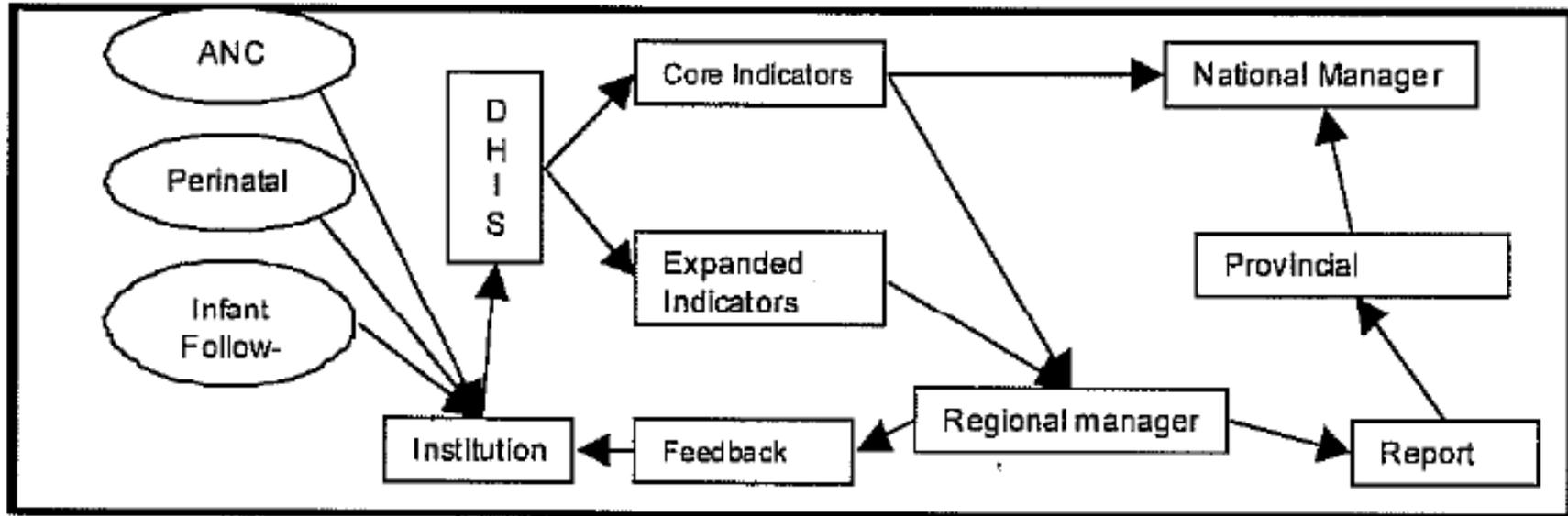
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Monitoring and Evaluation (M & E)

Figure 5: Basic overview of information flow



DHIS = District Health Information Systems



PMTCT indicators

- HIV testing
- PMTCT prophylaxis (mother & infant)
- feeding choice
- follow-up of mother and child

3 key service points:

- ANC

- Labour Ward & Post-natal Ward

-

Infant follow-up at post-natal or EPI services

Numerous CORE INDICATORS will need to be collected.

National Guidelines February
2008 PMTCT p.62 to p.68



Core indicators

- when a *programme* is set in place, we need to know if we are on the right pathway → watch these indicators eg number of women testing from a pooled register; ensure we reach the right targets
- *targets* are reached by achieving what we set out to do eg reduce HIV transmission by 5%



Core indicators

- *planning* is needed to ensure adequate staff and space are made available in the future
- *control* of the programme is also important to ensure feedback *quality* of service is maintained
- Facility information officers (FIO) and district information officers (DIO) responsible for data collection in registers etc
- NHLS have a valuable role

GOAL AND TARGETS

1. Goal

The goal of this guidance for global scale up of PMTCT is to improve maternal and child survival by achieving universal access to comprehensive PMTCT services to pave the way towards an HIV-free and AIDS-free generation by 2015.



Report - Global scale-up of PMTCT of HIV, WHO 2007



CONCLUSION

- Closing the treatment gap

Comprehensive and widely available PMTCT programmes could substantially improve the quality and duration of life among women and children worldwide. Implementing the strategies and actions presented in this guidance will contribute to rapidly expanding services to achieve the goal of universal access to HIV prevention, treatment, care and support by 2010 and will make progress towards eliminating HIV infections among infants and young children by 2015. This will require the concerted efforts of governments and their partners to maximize the utilization of limited expertise and resources towards a common national goal.

HIV/AIDS Programme

Strengthening health services to fight HIV/AIDS

ANTIRETROVIRAL DRUGS FOR TREATING PREGNANT WOMEN AND PREVENTING HIV INFECTION IN INFANTS: TOWARDS UNIVERSAL ACCESS

Recommendations
for a public health approach



2006 version

WHO 2006 www.who.int

References

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- www.who.int
- SAMJ (SAMA), CME
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Thank you
Ngiyabonga
Enkosi
Dankie

ark
absolute return for kids



Department of Health
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