

PMTCT: The dilemma of feeding the HIV-exposed infant

Unit 5.2

Paediatric Antiretroviral Therapy Workshop
Institute for Human Virology-Nigeria ACTION

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Case 1



- An unwed teenage girl began receiving ZDV/3TC/NVP at 36 weeks gestation; treatment was continued post partum
- Advised not to BF
- Infant referred to NAUTH at 2 months of age with marasmus and no other signs of HIV

Case 2



- Mother diagnosed with HIV at 2 months post partum
- Advised to discontinue breastfeeding and infant referred to paediatric HIV service
- When seen 2 weeks later, infant had marasmus, dermatitis, hepatosplenomegaly, adenopathy, and CD4 = 150.

HIV AND INFANT FEEDING: THE DILEMMA

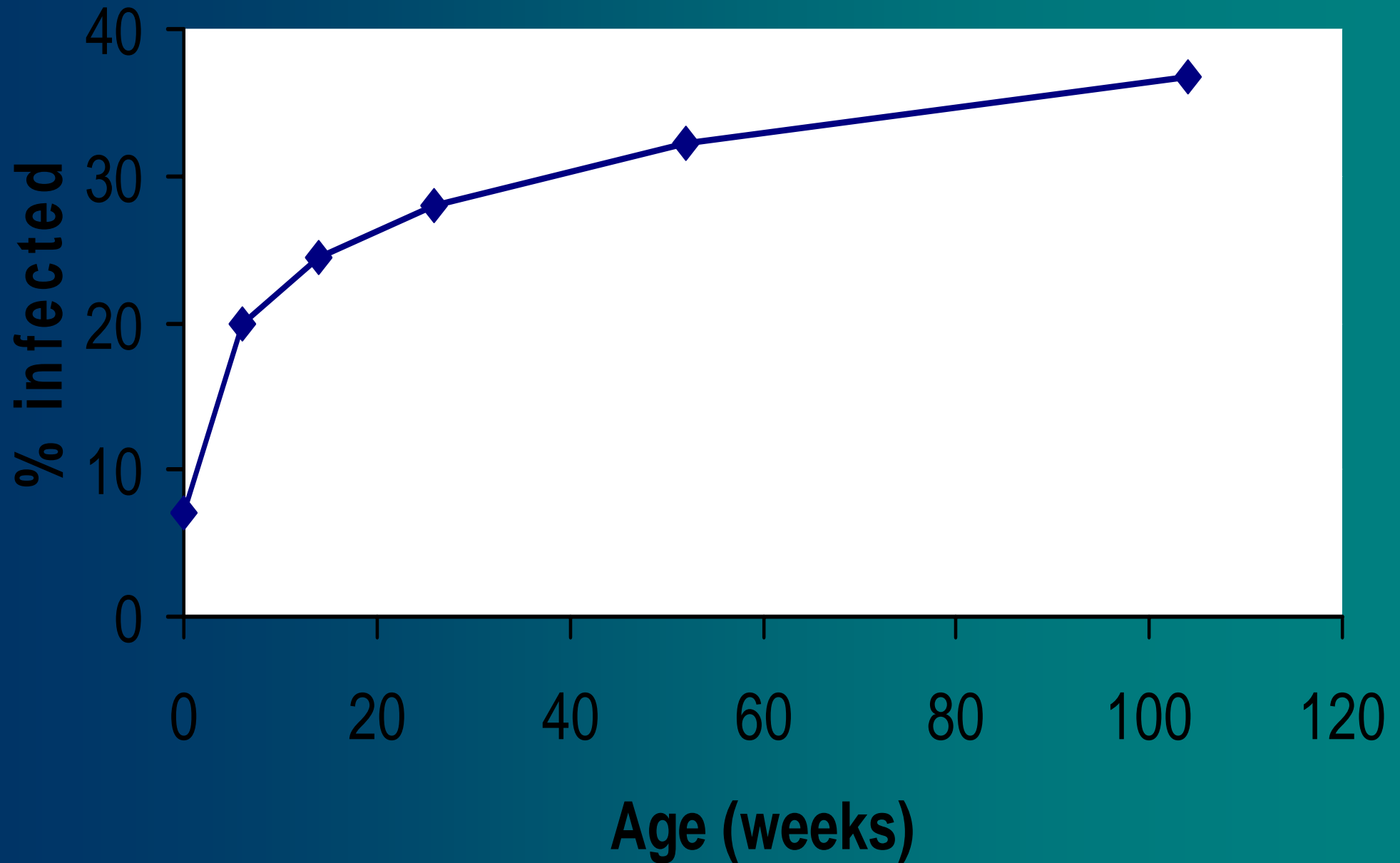


Infant feeding and transmission of HIV



- About 10-18% additional risk of transmission from breastfeeding
- Risk highest in early infancy but continues throughout breastfeeding
- Risk higher in women with more advanced disease (high viral load)
- Risk higher with breast inflammation: importance of good breast health

HIV infection rate in breastfed infants (Nduati, et al., JAMA 200)

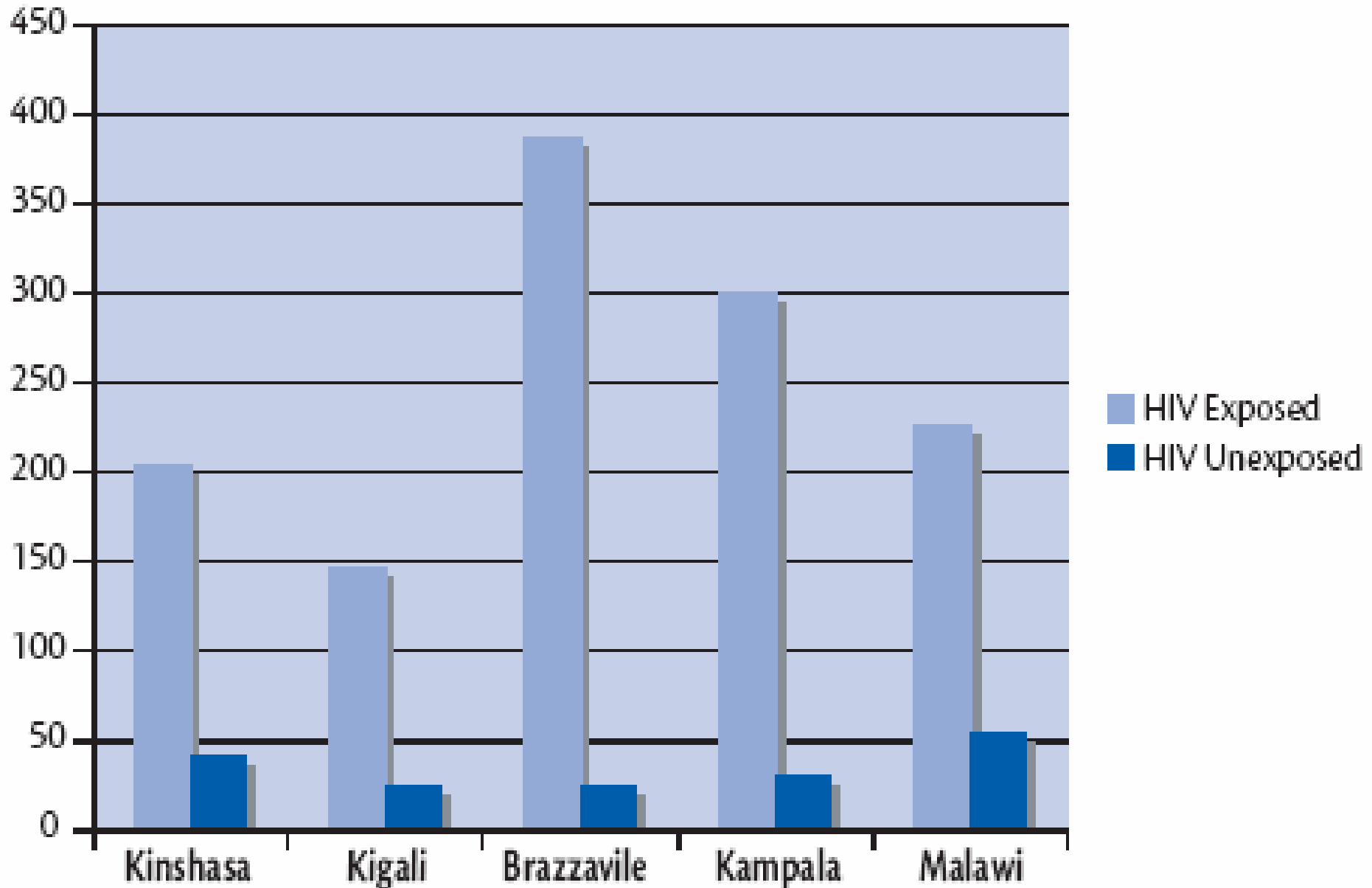


Mortality in HIV-exposed and HIV-unexposed infants

(From ANECCA manual 2004)



Mortality per 1000 infants



Substitute feeding of the HIV-exposed infant



	Benefits	Risks
Child	Reduced HIV risk	Infections Malnutrition
Family	Child survival Self-efficacy	Stigma/disclosure Cost of formula, fuel Burden of preparation Child spacing
Society	Reduced medical costs Return on social investment	Cost of formula, etc. Dilution of breastfeeding efforts

Infant feeding types



- **Types of breast feeding:**
 - Exclusive breast feeding (EBF): *nothing* other than breast milk
 - Partial breast feeding (PBF): breast + non-milk liquids (water, teas, etc)
 - Complementary feeding (CF): breast + solids
 - Mixed milk feeding (MMF): breast + non-human milks +/- solids
- **Breast milk substitute feeding (BMS)**
 - No breast milk
 - Other animal milks +/- solids

Infant feeding type and risk of HIV transmission



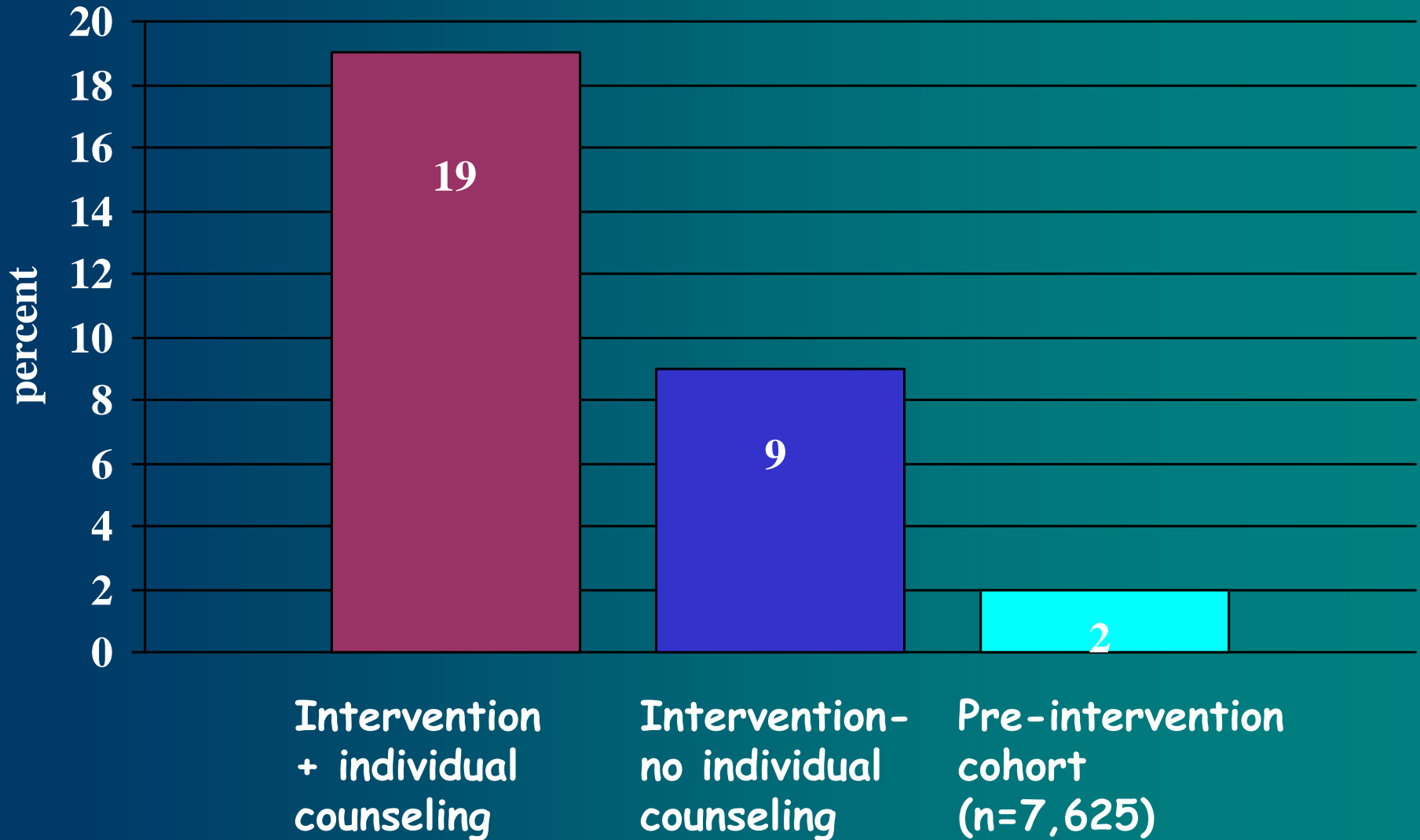
- Risk of acquiring HIV from breast milk according to feeding type at 3 months of age
 - 7% if *exclusively* breast fed
 - 14% if complementary fed (CF) or mixed milk fed
- However, most women advised to exclusively breast feed actually complement breast milk with solids or use mixed milk feeding

Breastfeeding and HIV transmission: More data-1



- **Kenya randomized breast vs formula (Nduati 2000)**
 - Infection status at 24 months ($p = 0.001$)
 - * 36.7% breast
 - * 20.5% formula
 - Mortality at 24 months (NS)
 - * 24.4% breast
 - * 20.0% formula

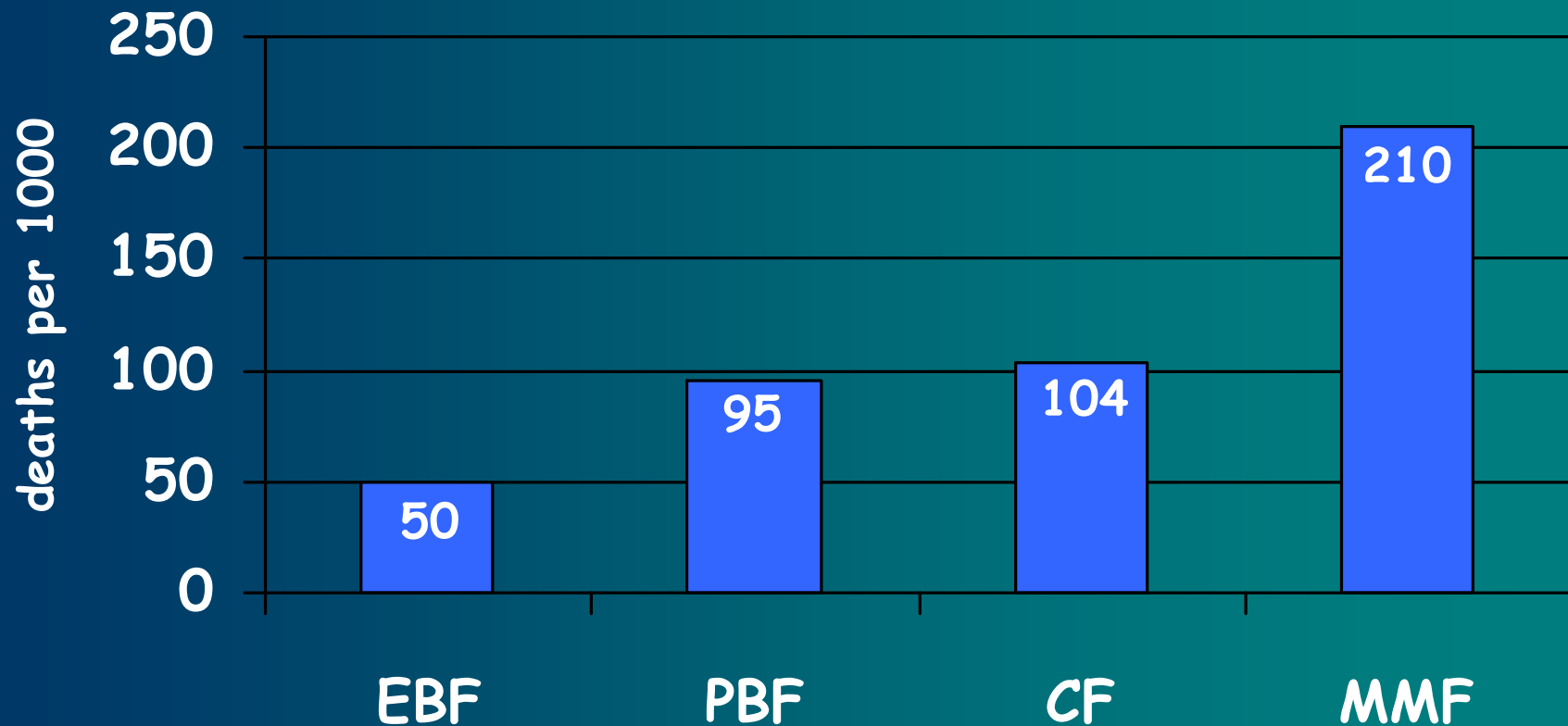
Zimbabwe MTCT study: Exclusive breast feeding rates at 3 months (n=732; Piwoz, et al 15th International AIDS Conference, 2004)



1st year mortality of babies of HIV + mothers by feeding pattern to 3/12



("ever", n=2892)



Compare with mortality rate of 22/1000 for babies of HIV-mothers, and 170/1000 for all babies of HIV+ mothers

To breastfeed or not to breastfeed: which is safest?



- Study in Nairobi randomly assigned HIV-infected mothers to:
 - Breastfeed with advice to exclusively breast feed
 - Formula feed with formula and training provided by study

Outcome of breast versus formula study



- **HIV infection**
 - Breast 36.7%
 - Formula 20.5%
- **Death by 2 years of age**
 - Breast 24.4%
 - Formula 20.0% (no significant difference)
- **Death by 2 years or HIV infection**
 - Breast 42%
 - Formula 30%

Limitations of breast versus formula study



- *Study provided formula and training*
- *Reasonably clean municipal water*
- These conditions may not be easy to duplicate!
- Whether these results apply to the *individual mother and infant* has to be determined according to *individual circumstances*
- There is no one “right” answer- we must help each family discover what is best for them

Use of antiretroviral drugs to prevent HIV transmission from breast milk



- **Give ARVs to baby?**
 - Results from studies not completely clear- may be beneficial, but more study needed
- **Give HAART to mother?**
 - HAART brings viral load in milk to nondetectable in most cases
 - Not know for sure how well that may protect against transmission of HIV
 - Therapeutic doses of ARV do not get to baby, so if infected, possible resistance

WHO AFASS framework for exploring alternatives to breastfeeding- 1



Acceptable?

What does woman really want?

Is she being pressured by her family or others?

Feasible?

If no refrigeration, must be prepared several times/day

Affordable?

Can the family afford breast milk substitute (20 kg BMS in first 6 months!) and fuel to safely prepare?

WHO AFASS framework for exploring alternatives to breastfeeding- 2



Sustainable?

Can family keep up with the cost and effort? Is the supply of safe BMS assured?

Safe?

What will infant be fed- balanced commercial formula, modified milk, starch, or cow's milk?

Is clean water and soap for washing available?

Will family adhere to safe preparation methods?

Breast milk substitute (BMS) feeding of the HIV-exposed infant



- **Requires education**
 - Danger of contamination leading to cycle of diarrhea and malnutrition
 - Malnutrition if breast milk substitute not of proper composition
- **Requires training**
 - Proper composition of home-made BMS
 - Selection of commercial infant formula
 - How to prepare, store, and feed
- **Requires support**
 - Consider sustainable provision of formula
 - Psychosocial support, especially regarding risk of disclosure of HIV diagnosis

Problems experienced by programs providing breast milk substitute (BMS)



- Poor quality counseling
- Not all mothers accept BMS; stigma
- Many mothers continue breast + BMS (i.e. mixed feeding, putting child at risk for HIV and diarrhea/malnutrition)
- Difficulty sustaining supply
 - Program runs out
 - Family runs out before scheduled visit or misses visit
 - Diversion of product
- Improper preparation, storage, feeding
- “Spillover” effect on breastfeeding in HIV- mothers

Early weaning of HIV-exposed infant?



- Greatest morbidity and mortality to non-breastfed infant is in first 6 months
- If substitute is not “AFASS” at birth, situation may be different by 6 months, when infant would usually start solids
- Consider early weaning: abrupt weaning recommended, but hard to do
- However, infant would have already been exposed to much of risk of breastfeeding by this time.

Summary of key points



- HIV is transmitted to about 15% of exposed infants after 24 months of BF
- Exclusive BF appears to decrease risk (by about half), but not eliminate risk
- EBF greatly reduces infant mortality in setting of high infant mortality, but achieving EBF is difficult
- Mortality in non-BF infants highest in first 3-6 months of life: EBF then early weaning offers best chance of HIV-free survival for many infants of HIV-infected mothers *not receiving ARVs.*
- Infants of mothers receiving ARVs are *probably* at lower risk of HIV transmission