



# Breastfeeding in the Context of HIV/AIDS: Facts vs Assumptions

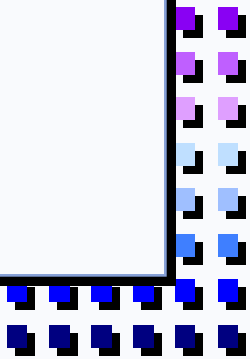
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# Outline of presentation

- Will present assumptions around breastfeeding and HIV transmission and for each assumption will consider what facts there are available to either justify, refute or qualify the assumption
  - We will consider what research questions still need to be answered to allow us to examine some of the assumptions more carefully
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# Assumption:

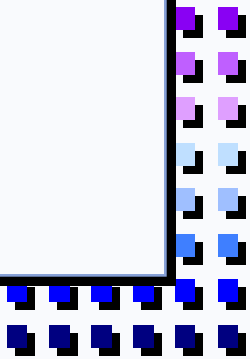
Breastmilk of HIV infected women contains HIV virus and breastfeeding is therefore dangerous for infants of HIV infected women –

therefore no HIV infected women should breastfeed





# Facts:

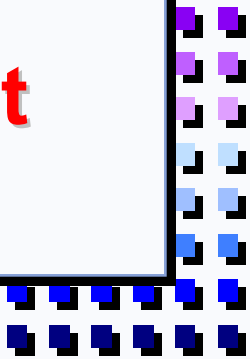
- Breastfeeding by HIV infected women does carry a risk for HIV transmission but the risk depends on many factors
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## Facts:

- In 1992 based on results from studies with very unequal numbers of breastfed and formula fed babies and with ELISA measurements at 18-24 months, Dunn et al estimated the additional risk of MTCT of HIV was 14% (CI: 7-22%) – no qualification of when tx occurred
- Recently 2 large studies (Kenya, South Africa) with over 100 breastfed and 100 formula fed infants and with frequent PCR testing confirmed finding but showed it was a ***cumulative risk over 24 months not a one off risk.***
- It was also clear from these studies that the ***risk was associated with mixed breastfeeding***

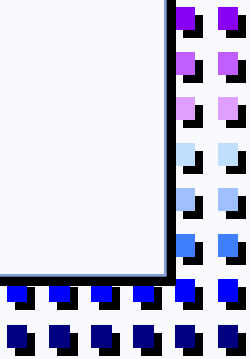


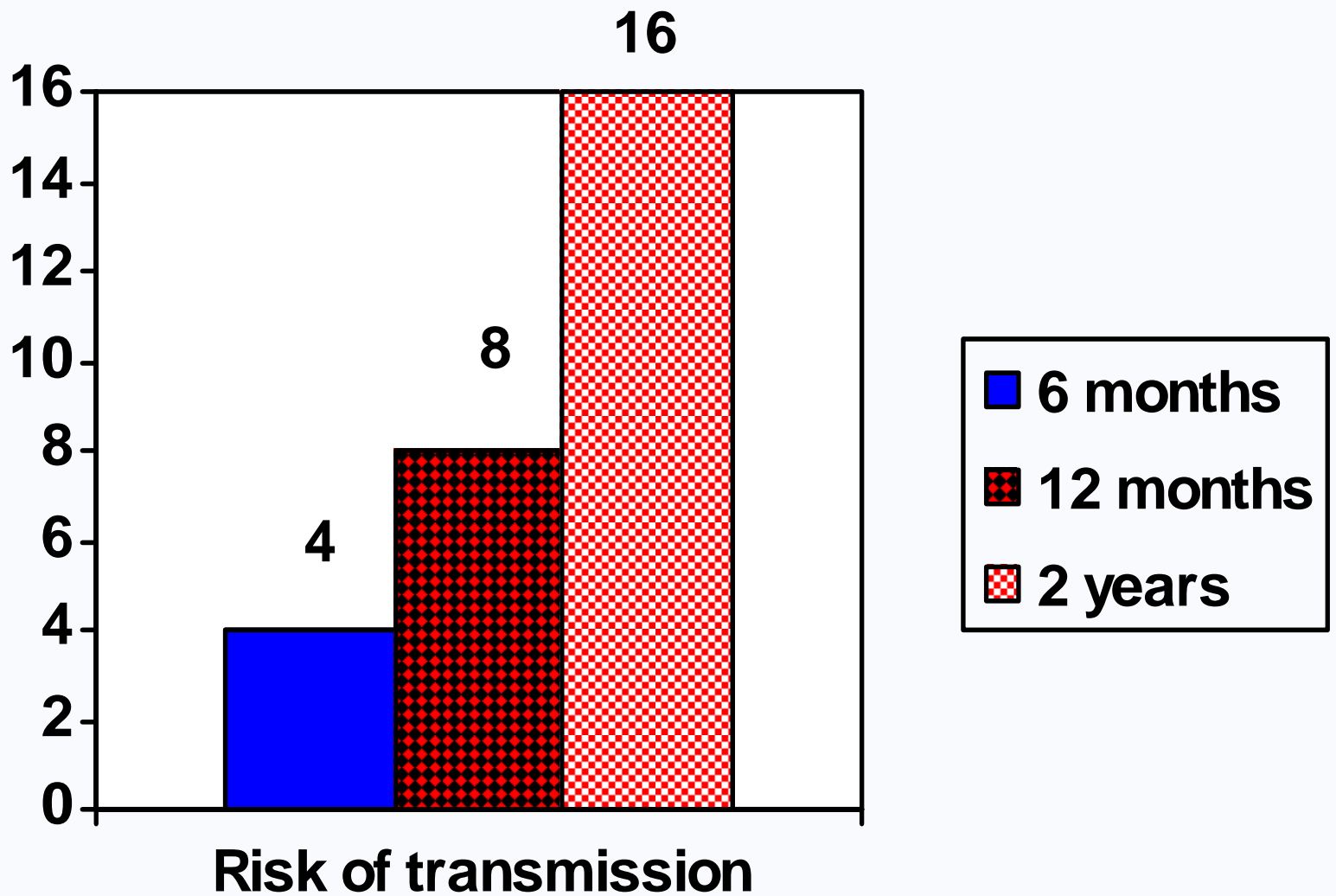
# Breastfeeding and HIV International Transmission Study – BHITS

- 3442 children uninfected at 4 weeks of age, of whom 231 became infected
  - Estimated rate of BF transmission was 8.0 per 100 child-years of breastfeeding = **0.74%/mth of BF – ie 6 months of breastfeeding carries a risk of about 4-5%**
- 



## Transmission and duration of BF – BHITS

- Risk was roughly constant over 24 months
  - Transmission related to non-exclusive breastfeeding (mixed breastfeeding)
- 



*Note: results represent worst case scenario as these populations were mixed breastfed with no lactation mx to prevent breast problems*

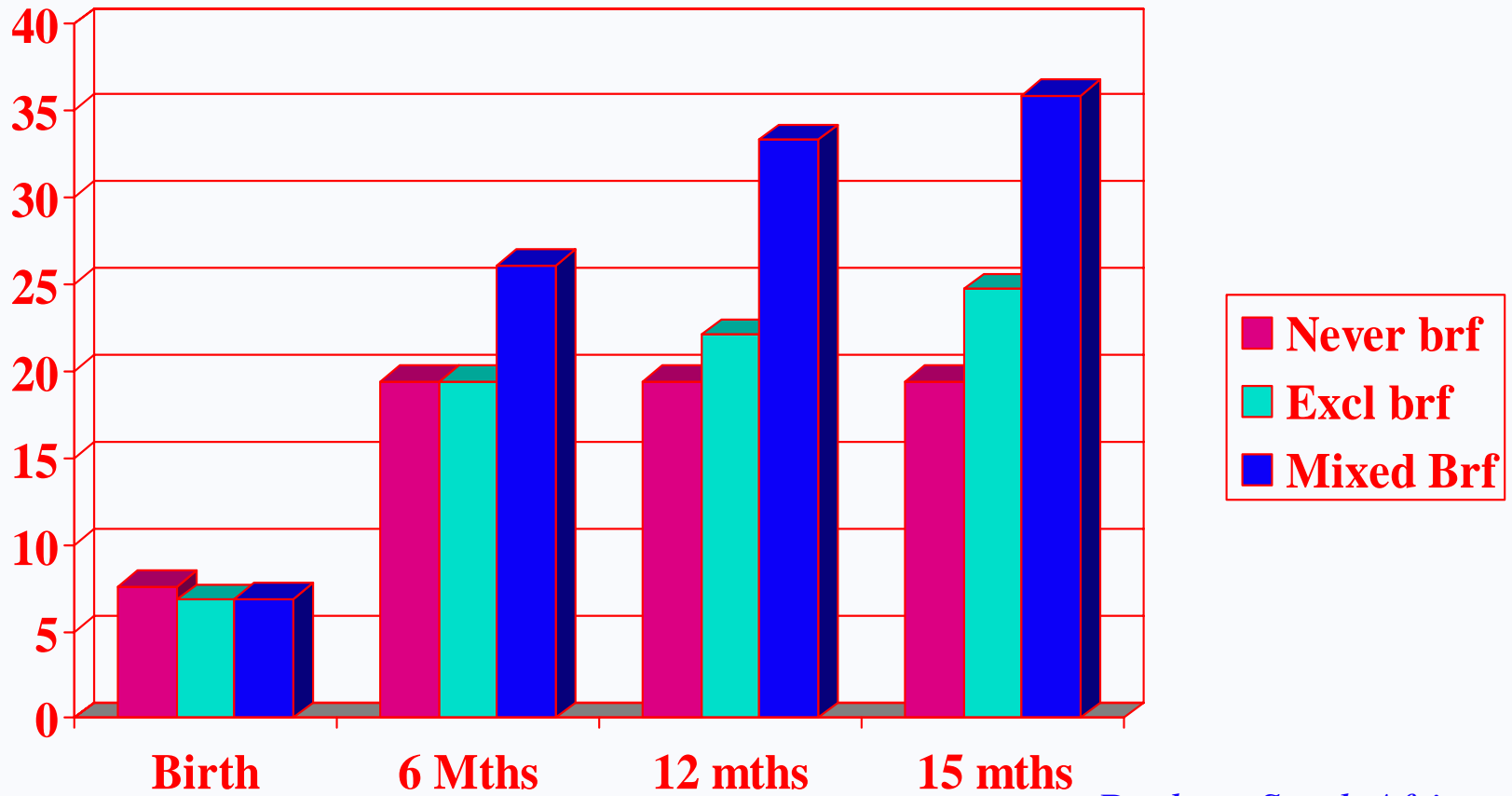




# Facts:

- What is the risk if women practiced exclusive breastfeeding for at least 3 months
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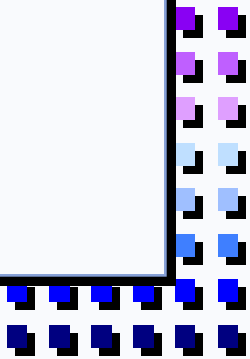
# Risk of HIV infection over time in 157 children never breastfed; 118 EBF; and 276 mixed breastfeeders



*Durban, South Africa*

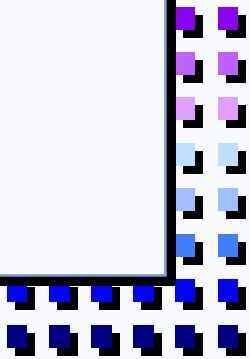


# Biological plausibility of benefit of ebf for reducing transmission risk

- Breast health
  - GI factors
  - Immune factors
- 

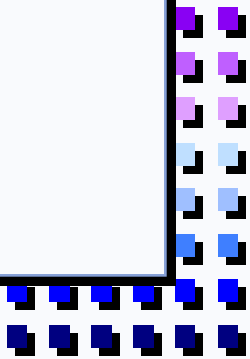


# Facts:

- Apart from mixed breastfeeding and prolonged durations of breastfeeding what other factors make breastfeeding risky for HIV transmission?
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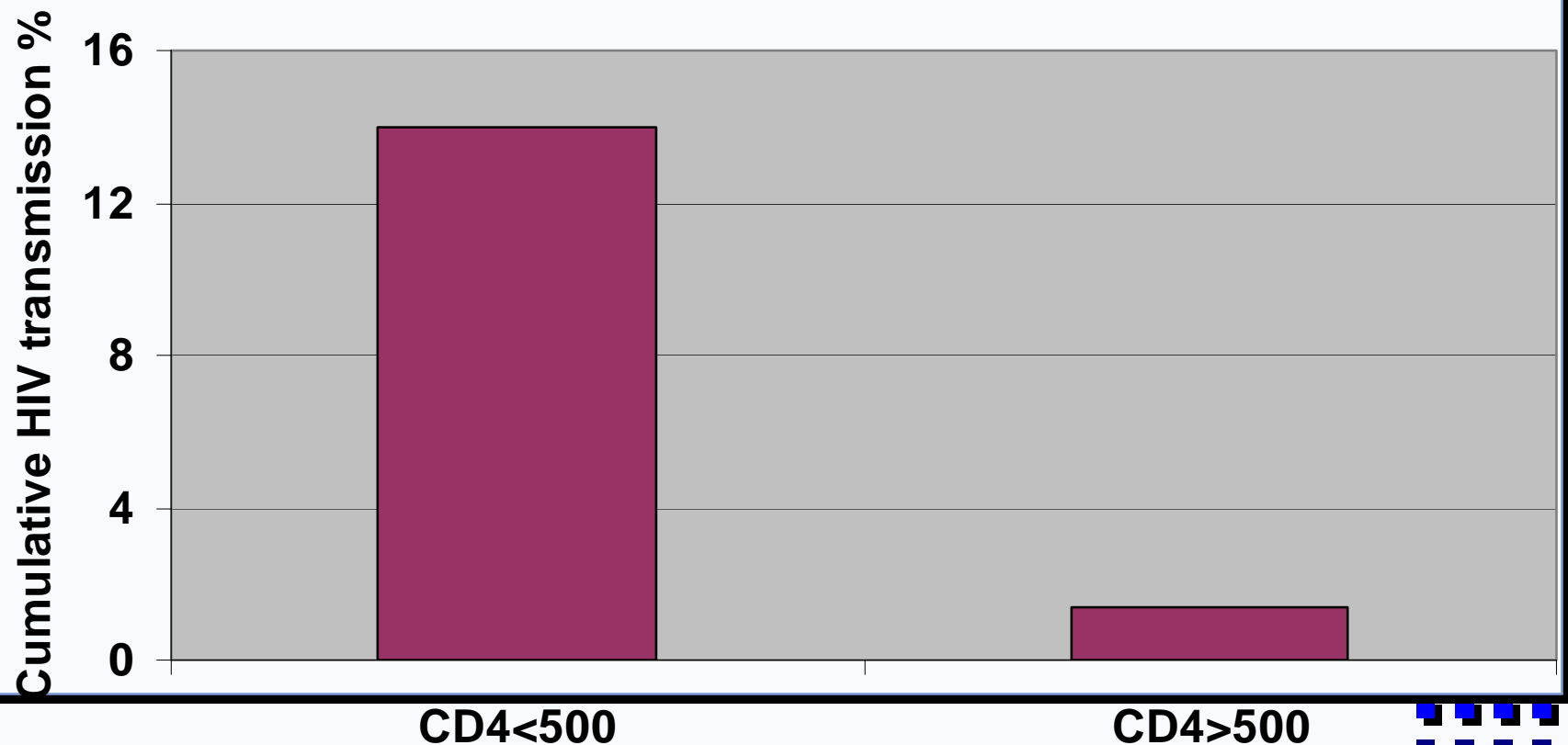


# Current understanding of risk factors

- **Prolonged breastfeeding**
  - **Mixed breastfeeding**
  - **High plasma viral load, low CD4**
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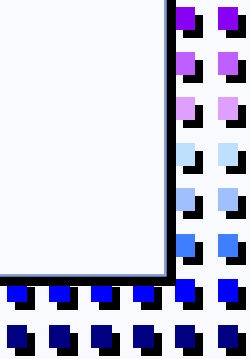
# Risk factors for postnatal transmission: Maternal immune status

## HIV transmission from 6w-24mths in W.Africa by maternal baseline CD4 count





## Current understanding of risk factors

- Prolonged breastfeeding
  - Mixed breastfeeding
  - High plasma viral load, low CD4
  - Seroconversion during lactation
  - Mastitis
  - Cracked bleeding nipples, abscesses
  - Sub-clinical mastitis (raised Na/K ratio)
  - High viral load in breastmilk
  - Oral thrush in infant
- 



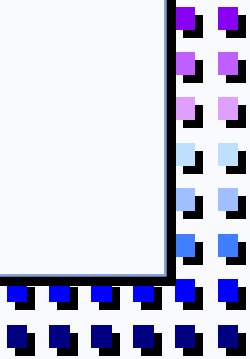
# Facts:

- By reducing/eliminating these risk factors breastfeeding can be made safer
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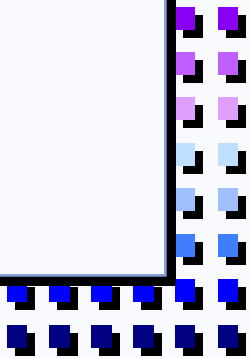



# Making breastfeeding safer in terms of HIV transmission with the current knowledge we have

- Exclusive breastfeeding up to 6 mths
  - Shorter duration – 6 months??
  - Encourage condom use during lactation period
  - Good lactation management (attachment, positioning) to avoid mastitis
- 



# Making breastfeeding safer in terms of HIV transmission

- No feeding from breast with cracked bleeding nipples or abscesses (express milk from affected side and continue feeding from unaffected side)
  - Prompt treatment of oral thrush
  - Heat treatment of expressed breastmilk
  - Anti-retrovirals to infant during breastfeeding period
- 

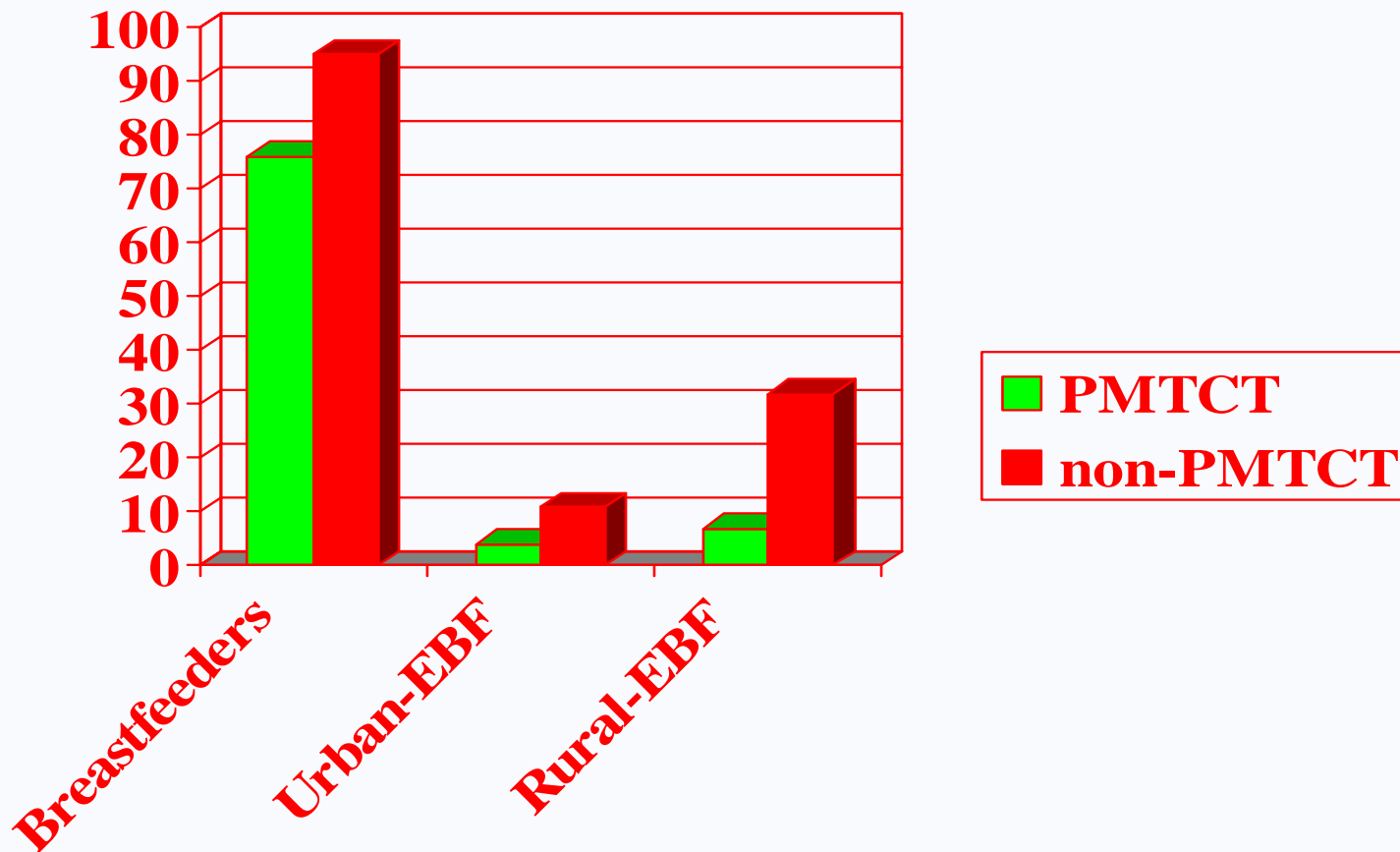


**To ensure exclusive breastfeeding occurs – health workers need to be committed to improving breastfeeding practices.**

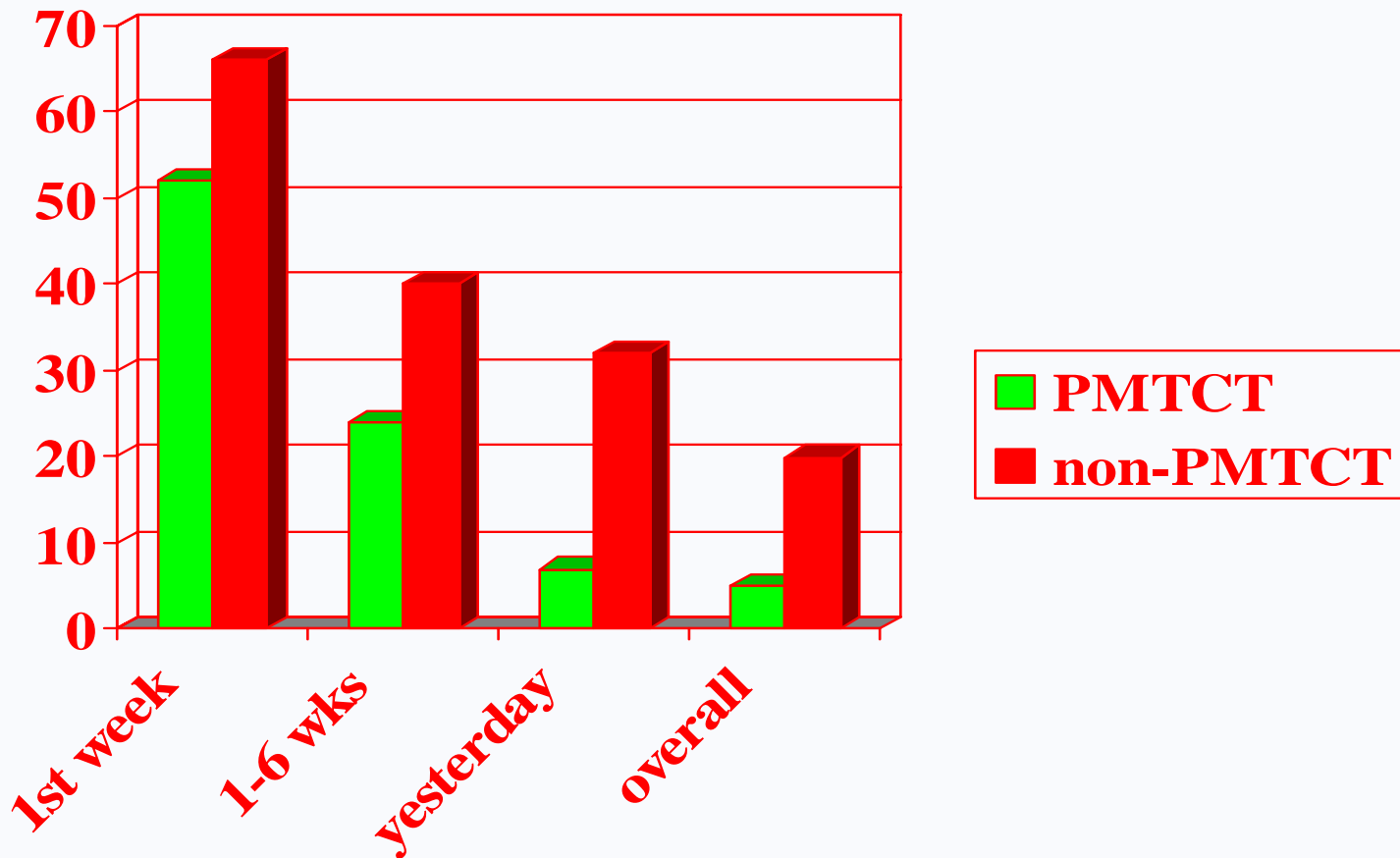
**This is only possible if free formula is not distributed and effort is put into promoting BFHI and good breastfeeding practices.**



# % breastfeeding in non-infected mothers at PMTCT and non-PMTCT sites in Botswana showing “spill-over” effect

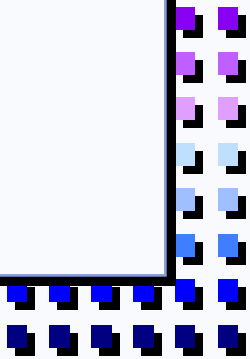


# **% Exclusive Breastfeeding in uninfected mothers at PMTCT and non-PMTCT sites in Botswana showing “spill-over” effect**



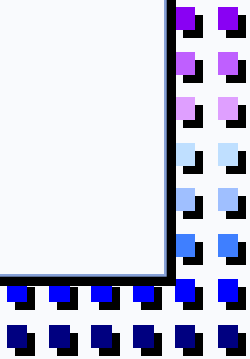


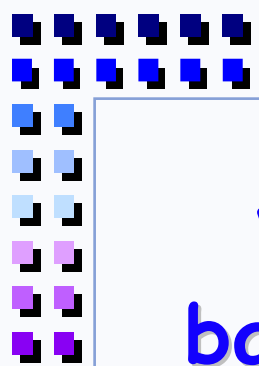
# Assumption:

- Because of the risk of HIV transmission through breastfeeding, all HIV infected women should replace breastfeeding (usually with formula feeding) – this implies that there is no risk associated with formula feeding
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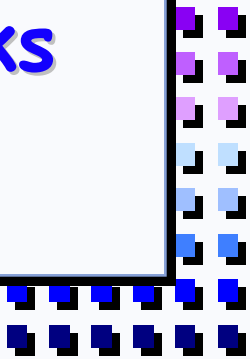


# Facts:

- There are risks associated with not breastfeeding and these will obviously vary according to different socio-economic conditions
- 



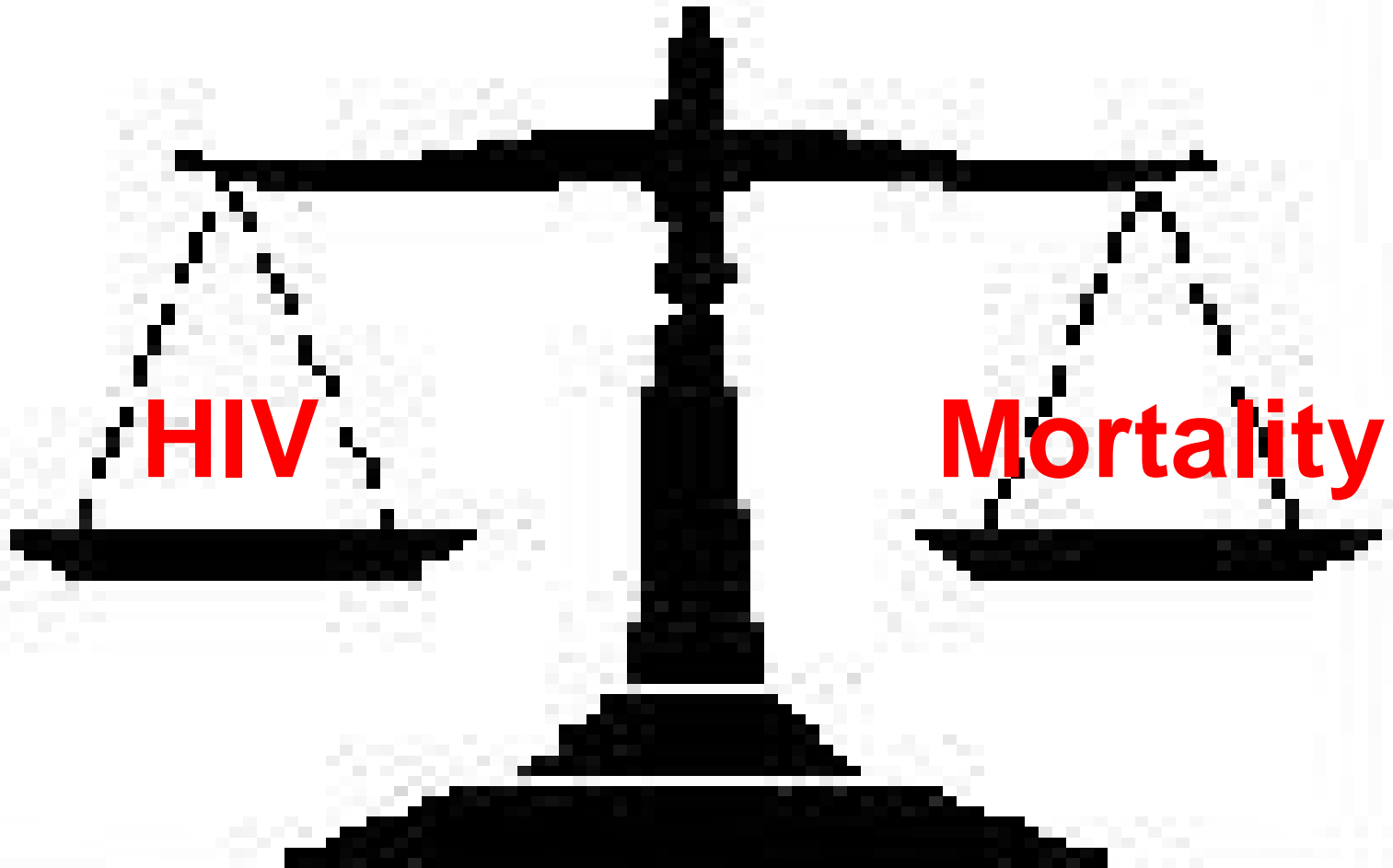
We need to remember that a similar balance of risks is associated with mode of delivery - vaginal delivery carries more risk for HIV transmission however we don't automatically recommend c/s in resource poor settings because there are risks attached to this intervention - similar scenario exists in terms of not breastfeeding - cannot simply recommend it because there are substantial risks associated with formula feeding

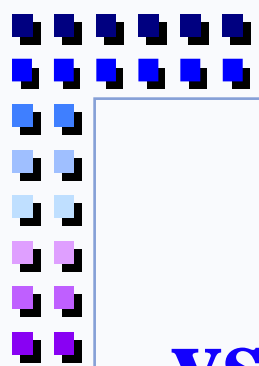




**Breast**

**Formula**





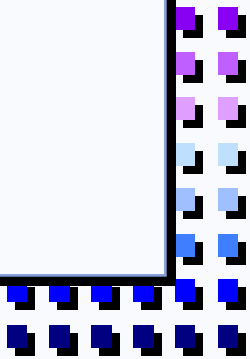
# **Risks : HIV Infection with brf vs Mortality with avoidance of brf: *Global Figures***

**Babies infected through  
breastfeeding**

**300 000 p.a  
(UNAIDS)**

**Mortality from  
avoidance of breastfeeding**

**1 500 000 p.a.  
(UNICEF)**



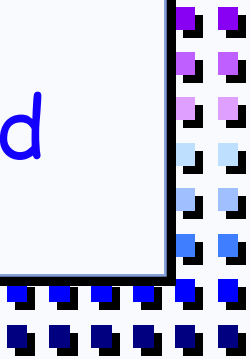


what are the risks of not  
breastfeeding?





# **Not breastfeeding – results in loss of benefits of breastfeeding:**

1. Optimum nutrition until 6 months
  2. Protection from infectious diseases
  3. Cognitive development
  4. Bonding and psycho-social benefits
  5. Delays maternal fertility
  6. Decreased maternal ovarian and breast cancer
- 



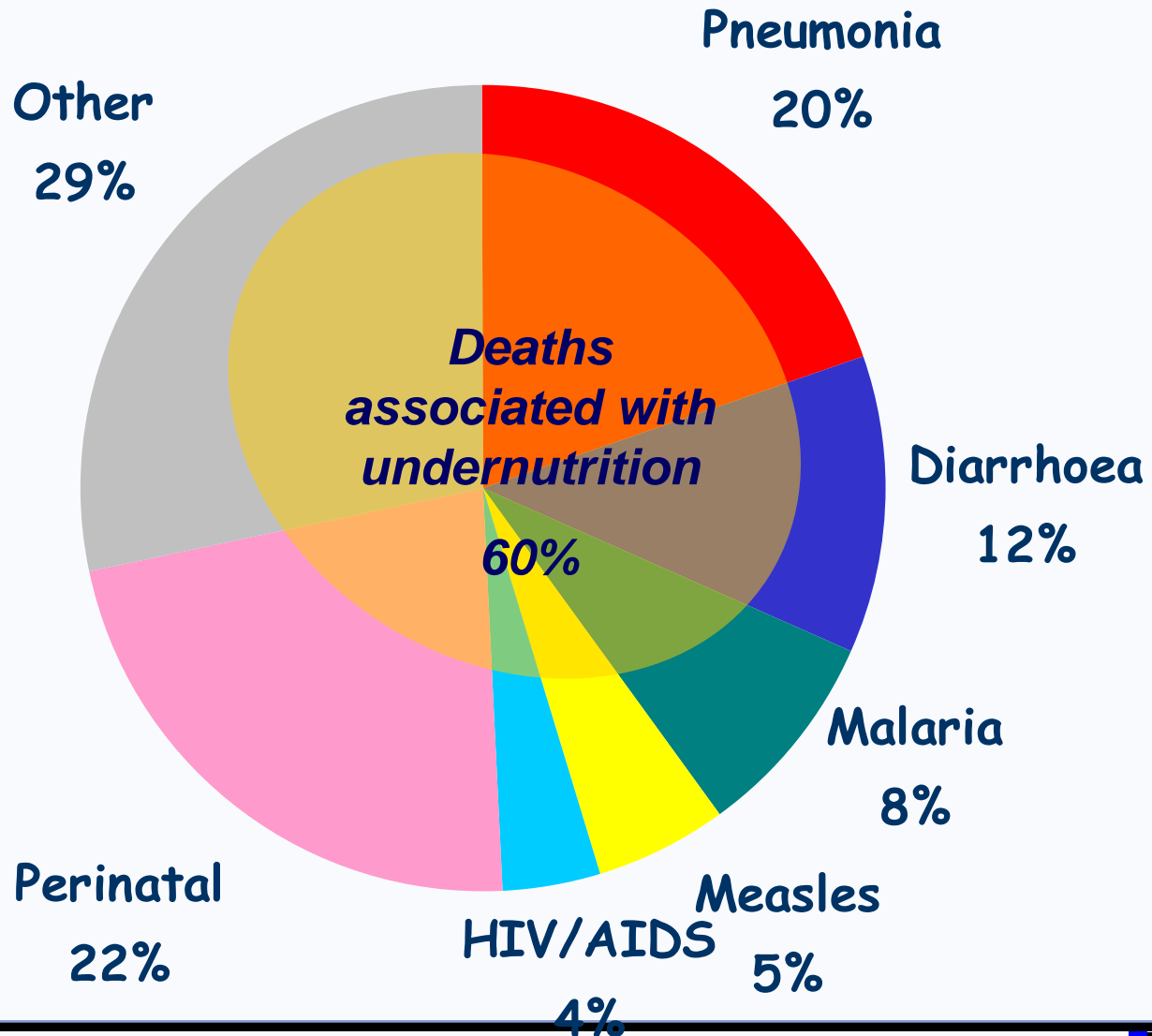
# Economic Benefits of Breastfeeding in USA

\$3.6 billions could be saved from the Rx of OM, GE, and NEC by merely increasing breastfeeding rates from the current 29% (at 6 mths) to 50%.

*Nutrition Research Report no.13  
March 2001,  
Jon Weimer, USDA*



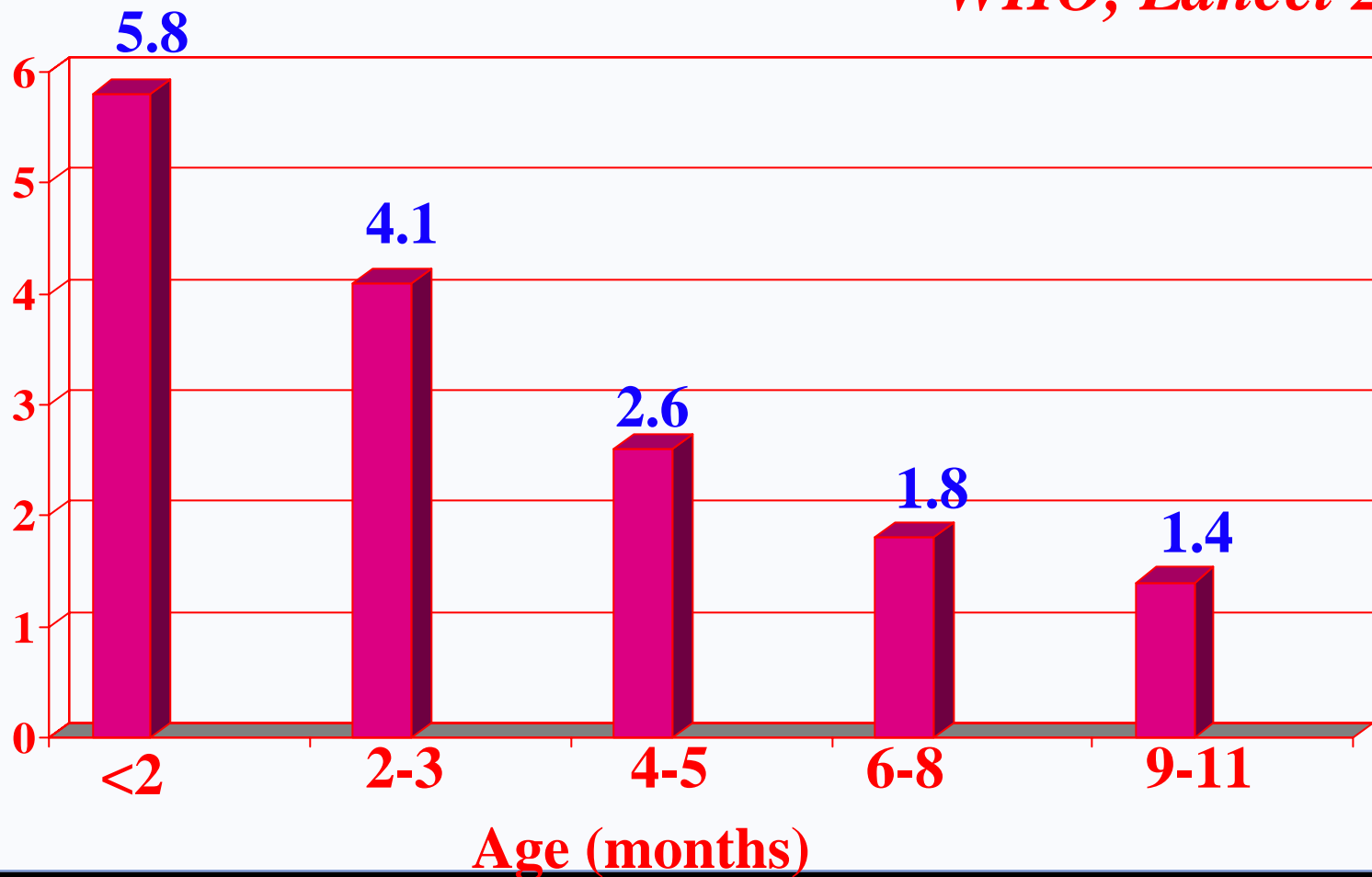
# Major causes of death in children under five, global figures 2000



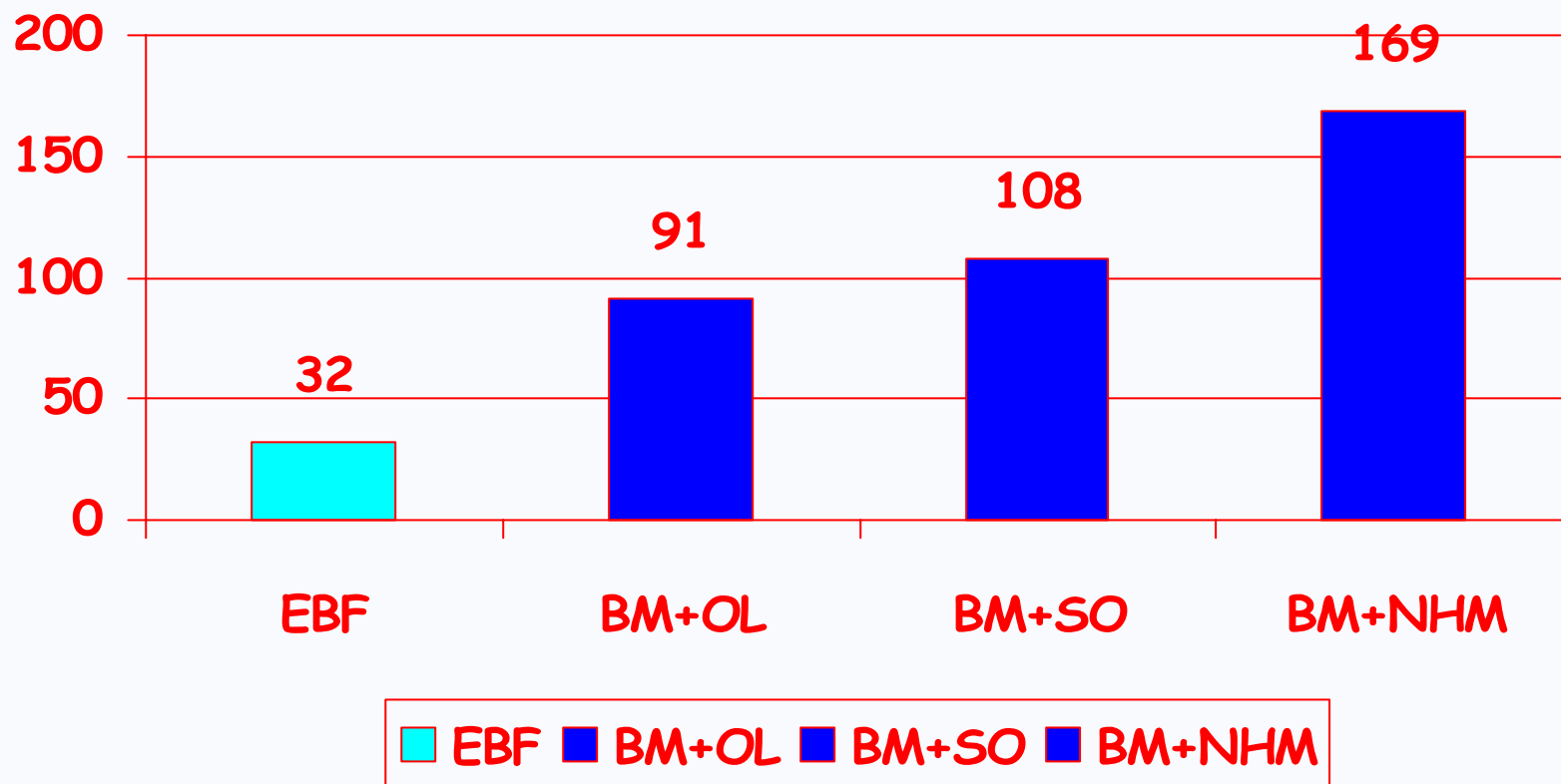
# Not breastfeeding increases mortality

RR of infectious disease mortality among non-breastfed infants

*WHO, Lancet 2000*



Increasing levels of replacement of breastmilk in the first 3 months is associated with increasing risk of mortality in Zimbabwean study of HIV infected women

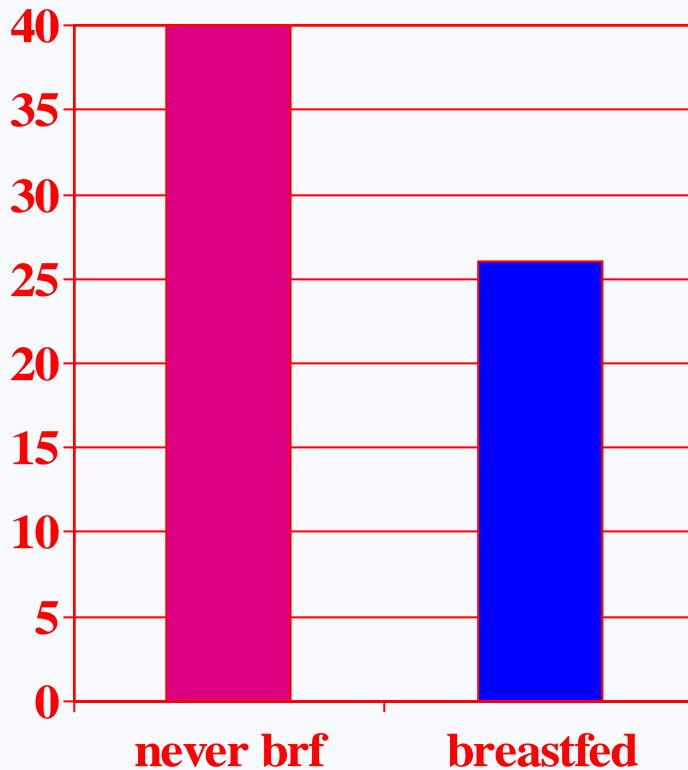


*Adjusted HR for BM+NHM (non-human milk) vs EBF = 4.5*



Not breastfeeding in the first 2 months significantly increases morbidity in infants born to HIV infected women

*Durban VITA/breastfeeding study*



% of infants who had an illness episode in the first 2 months

Coutsoudis et al. in press, Acta Paediatr, Aug 2003.



# Even early cessation of breastfeeding has been associated with increased morbidity

## *Zambia Exclusive Breastfeeding Study*

*(personal communication, L Kuhn not to be quoted)*

Infants randomised to:

EBF for 4 mths and then rapid weaning or

EBF for 4 months and gradual weaning:

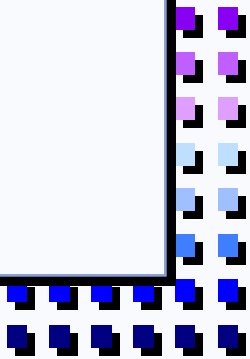
**Early results:**

Infants in group that was rapidly weaned had:

- increased diarrhoea and ARI
  - significant growth failure
- 



# Assumption:

- Decisions on replacement feeding, only need to be made for the negative HIV infants – what about those born HIV positive – an assumption is made that they should be fed with formula milk
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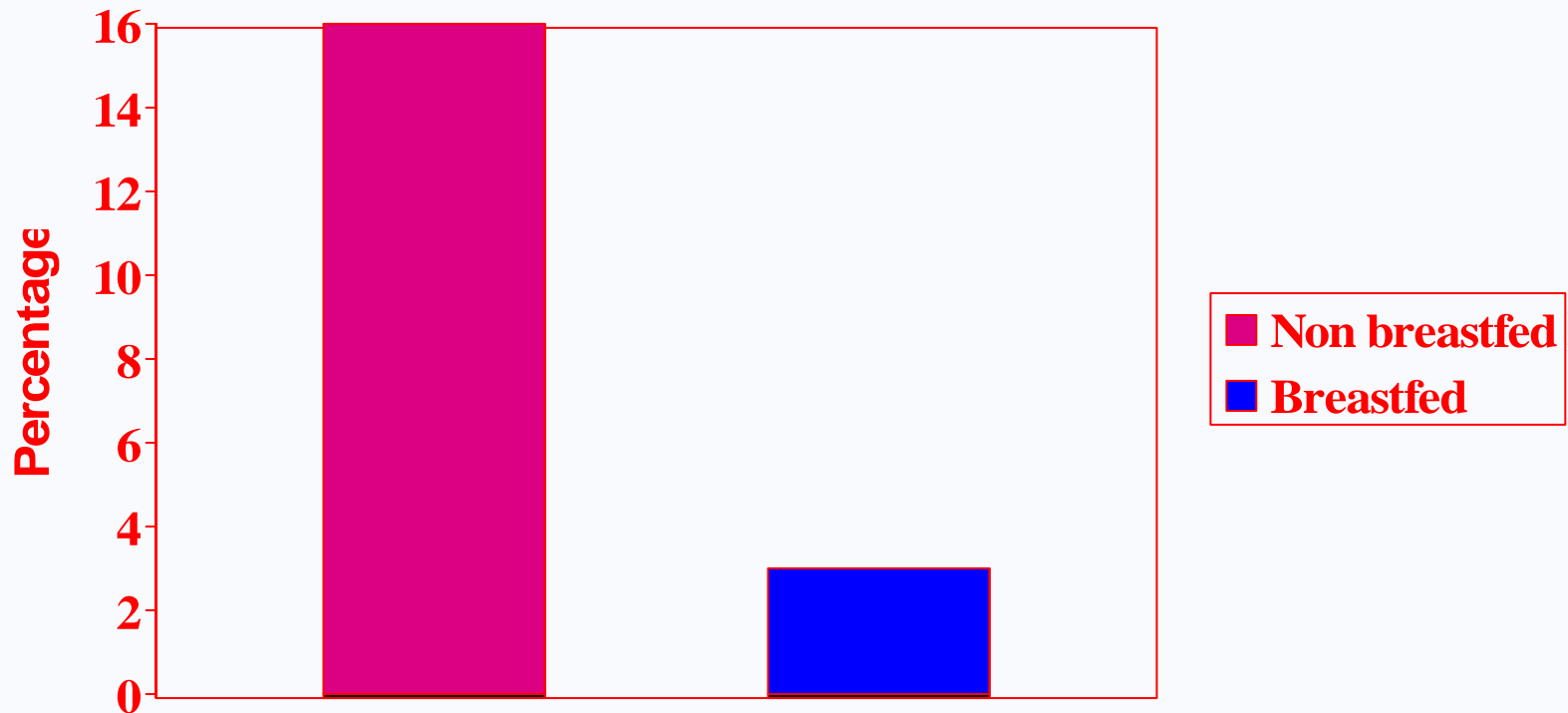
## Facts:

The number of children born HIV infected in resource poor settings is about 20% and in those resource poor settings which have instituted the nevirapine regimen to reduce PMTCT this % will drop to about 12% - still a substantial number worth considering – before subjecting them to the risks of formula feeding.

# Facts:

**HIV infected children who were not breastfed had significantly more recurrent diarrhoea**

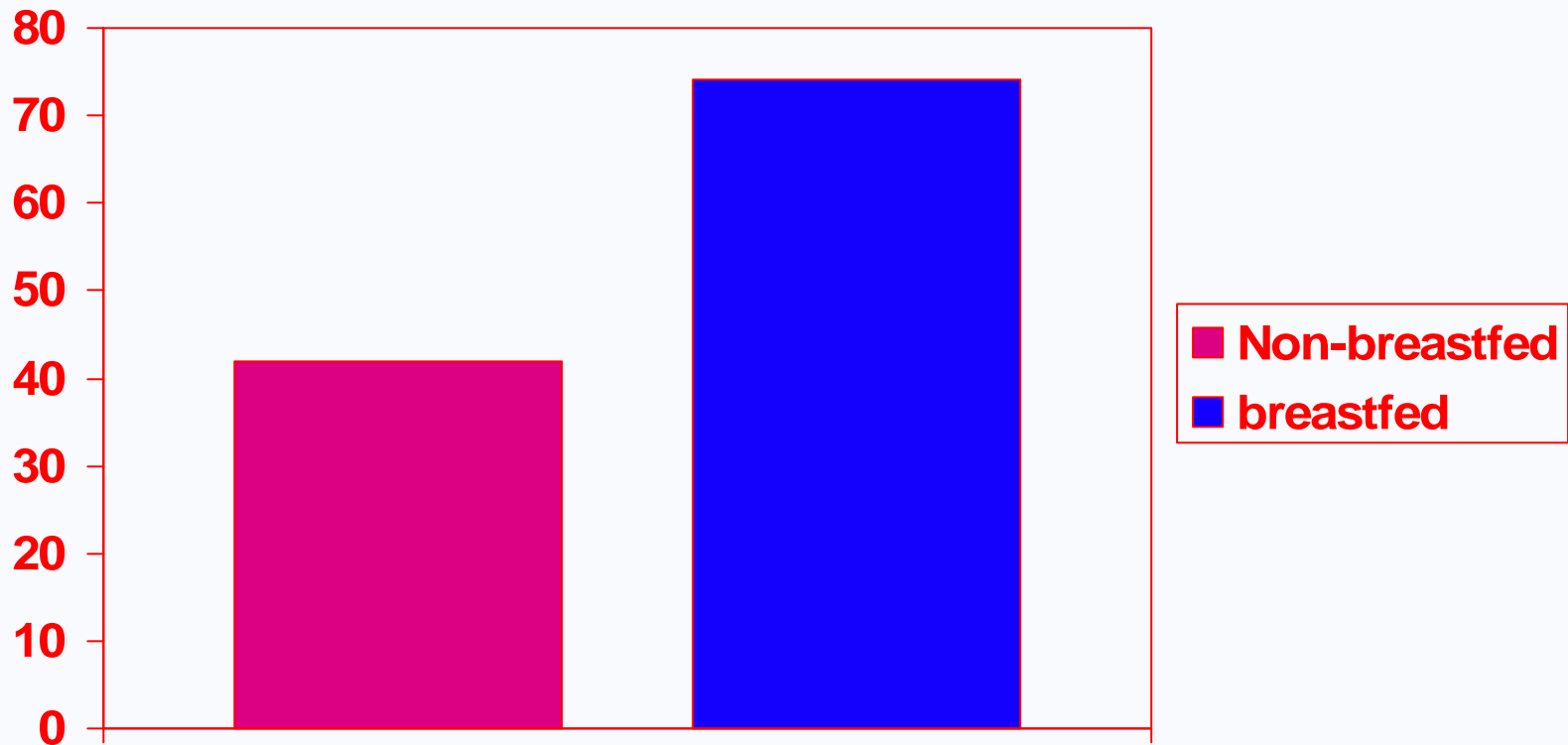
*Frederick et al, Los Angeles Study 1997  
(138 HIV infected children, 43% breastfed)*



# Facts:

## HIV infected children who were not breastfed progressed to AIDS more quickly

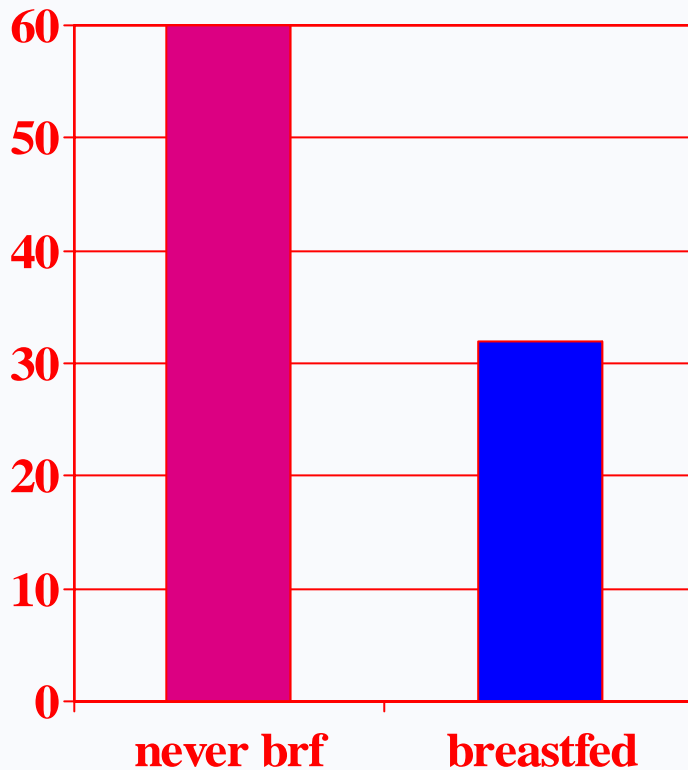
*Frederick et al, Los Angeles Study 1997  
(138 HIV infected children, 43% breastfed)*



# Facts:

HIV infected children who were not breastfed had significantly more morbidity

*Durban breastfeeding study*

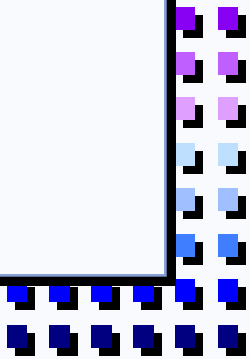


% of infants who had 3 or more morbidity episodes


Coutsoudis et al. in press, Acta Paediatr, Aug 2003



# Facts:

- There is a definite balance of risks which will depend on an individual woman's situation
- 



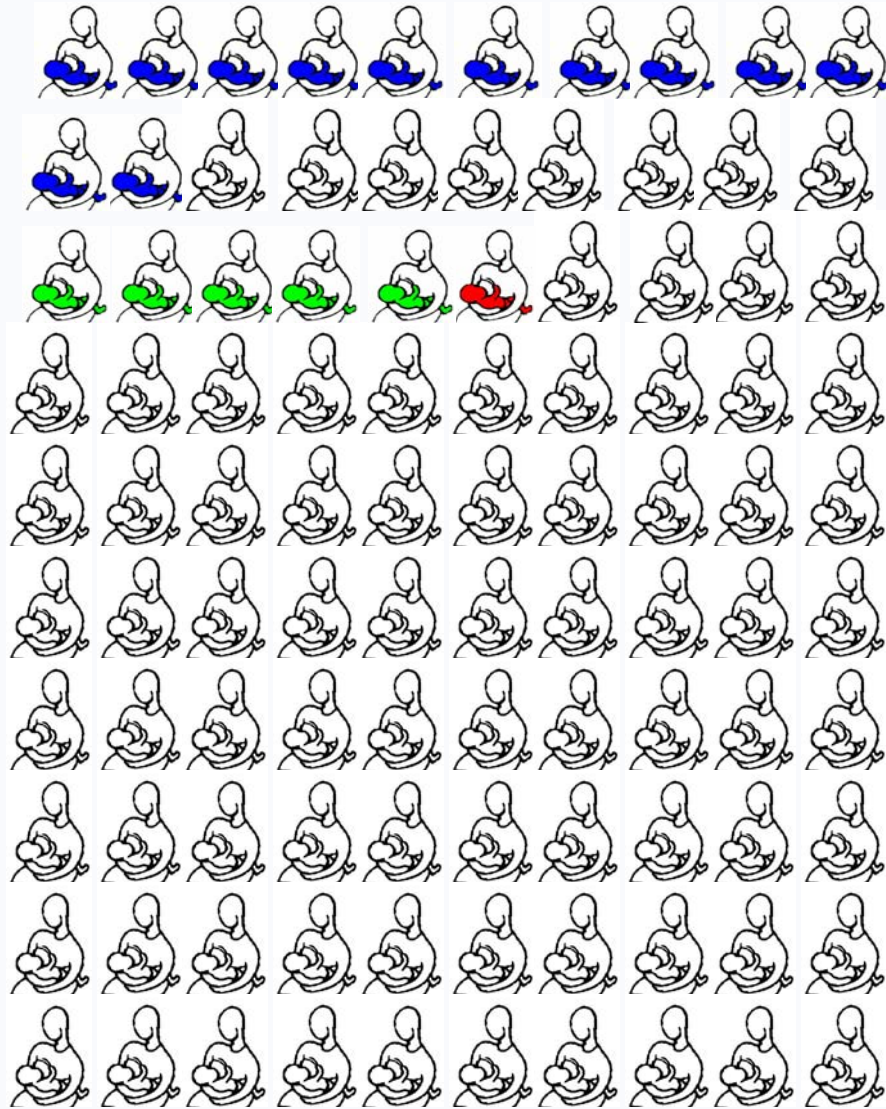


**Even with a low infant mortality rate of 40/1000 in breastfed populations like SA, about 1/100 would die of D&P and not breastfeeding, according to the WHO meta-analysis would push this up 6 fold ie 6/100 – so even at this low IMR, risk of formula feeding mortality = risk of HIV transmission thru’ 6 months of mixed breastfeeding (5%)**

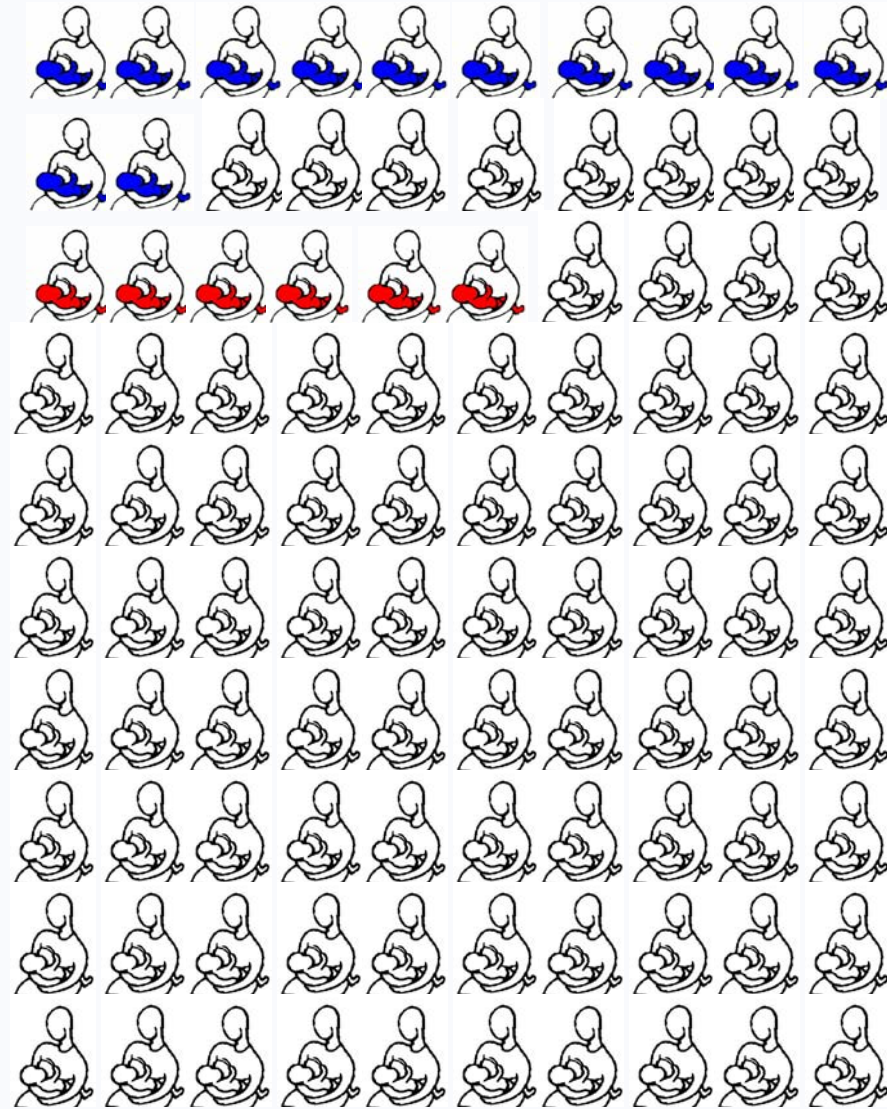
**Most countries in developing world have IMRs in excess (Malawi 132; Kenya 76)**



## Breastfed




## Formula Fed




😊 Babies born with HIV – better on breast 😊 Babies who will die of d & p

😊 Babies infected through 6 months mixed breastfeeding will be less with exclusive breast

**For most babies 6 months of exclusive breastfeeding will be the best option**



**If you answer no to any of these questions, formula feeding may not be the best option**

- Do you have easy access to clean safe water
  - Do you have easy facilities to boil water
  - Do you have facilities to sterilise bottles etc.
  - Do you have a fridge with regular electricity
  - Do you have a guaranteed income of R150/month to spend on formula, bottles, teats, sterilising fluid etc.
  - Does your family know your status & will they support you to formula feed
  - Will it be acceptable to give f/feeds at night or when baby is crying in public
  - Do you have easy access to clinic/hospital if child gets diarrhea
- 



# Assumption:

- HIV infected women who breastfeed are at risk for increased mortality
- 



# Facts:

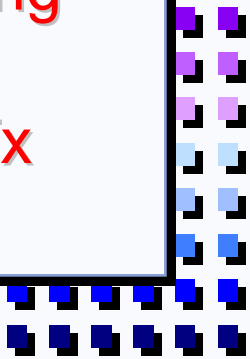
- This assumption is based on one study which has not been validated by a subsequent large meta-analysis
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# BF and Maternal death - BHITS

- Nairobi (Nduati): Relative risk of death for mothers assigned to BF vs. FF: 3.2 (p=0.01)
- SA (Coutsoudis): No significant difference
  - Mortality
    - » 0.49% (2/410) ever BF
    - » 1.92% (3/156) never BF
  - Morbidity similar between those who BF >3mths vs. those who did not (p>0.1)
- BHITS: 4237 mothers included – CD4 associated with mortality but feeding modality only significantly associated with mortality at 12 months and in fact breastfeeding mothers had a lower risk of mortality than mothers who did not breastfeed




## Some Research Questions that still remain unanswered

- What is the risk of HIV Tx at 12 and 24 mths if women practice “safe” breastfeeding including exclusive breastfeeding for 6 mths & then continue breastfeeding
  - Impact of lactation Mx, nutritional interventions, and antibiotic Rx on clinical and sub-clinical mastitis and thus on Tx risk
  - Effect of breastfeeding replacement on infant morbidity and mortality
  - Effect of “rapid” and early cessation of breastfeeding
  - Effect of breastfeeding on maternal health
  - Effect of antiretrovirals to mum, infant or both on Tx
- 



## Current Research Underway

- Effect of different breastfeeding patterns on HIV Tx – *SA, Cote D'Ivoire, Zimbabwe, Tanzania*
  - Diffs between rapid cessation of breastfeeding at 4 months compared to gradual weaning off breastmilk at about 2 years - *Tanzania*
  - HIVNET 027 – Safety trial of ALVAC (canary pox) vaccine vs placebo given orally to infants during breastfeeding period - *Uganda*
  - HIVNET 046 – trial of nvp vs placebo given to infants during the first 6 months of breastfeeding – *multi-site*
  - CDC study – trial of HAART to mum vs NVP to infant during breastfeeding period and effect of nutritional support - *Malawi*
- 



## Facts:

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- Recently 2 large studies (Kenya, South Africa) with over 100 breastfed and 100 formula fed infants and with frequent PCR testing confirmed finding but showed it was a ***cumulative risk over 24 months not a one off risk.***
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