愛滋產婦母乳哺育之安全性評估

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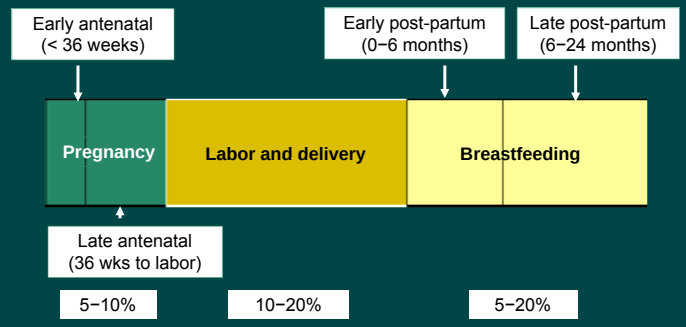
Magnitude of the MTCT Problem

- In 2005, 2.3 million children in the world were HIV positive; 87% of them were in sub-Saharan Africa.
- 800,000 children are infected with HIV every year, mainly through MTCT.
- The number of child deaths is expected to increase over 100% between 2002 and 2010.

Timing of MTCT with No Intervention



Adapted from CDC

Transmission Risk Factors during Pregnancy

- Viral, bacterial, or parasitic placental infection in the mother during pregnancy
- HIV infection of mother during pregnancy
- HIV viral load
- Severe immune deficiency associated with advanced AIDS in the mother

Transmission Risk Factors during Labor and Delivery

- Duration of membrane rupture
- Acute infection of the placental membranes (chorioamnionitis)
- Invasive delivery techniques
- CD4 count of mother
- Severe clinical disease of mother

HIV Transmission during Breastfeeding

- 5–20% risk
- Exact timing of transmission difficult to determine
- Exact mechanism unknown
- HIV in blood appears to pass to breastmilk
  - Virus shed intermittently (undetectable 25–35%)
  - Levels vary between breasts in samples taken at same time
- Virus may also come directly from infected cells in mammary gland, produced locally in mammary macrophages, lymphocytes, epithelial cells

Transmission Risk Factors during Breastfeeding: Mother

- Maternal immune system status (measured by CD4 count)
- Maternal plasma viral load
- Breastmilk viral load
- Recent HIV infection
- Breast health
- Maternal nutritional status

Transmission Risk Factors during Breastfeeding: Infant

- Infant age
- Mucosal integrity in the mouth and intestines

Transmission Risk Factors during Breastfeeding: Practices

- Duration of breastfeeding
- Pattern of breastfeeding (exclusive breastfeeding or mixed feeding)

Risk Analysis of Infant Feeding Choices for an HIV-Positive Mother

- Replacement feeding prevents HIV transmission through breastmilk, but in resource-limited settings, infants risk dying of other infections if replacement feeding is not done properly.
- The benefits of breastfeeding, despite the risk of HIV transmission, outweigh the risk of replacement feeding.

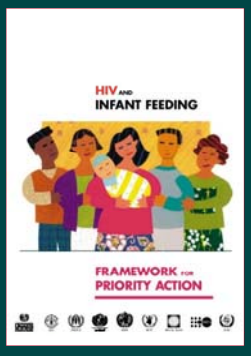
Technical consensus

- WHO HIV and Infant Feeding Technical Consultation was held in Geneva, October 25-27, 2006
  - HIV and Infant Feeding: New evidence and programmatic experience. Report of the Technical Consultation.
  - Consensus Statement
  - HIV and Infant Feeding: Update based on the Technical Consultation.

HIV & Infant Feeding: Framework for Priority Action (2003)

Purpose:

To recommend key priority actions, related to infant and young child feeding, that cover the special circumstances associated with HIV/AIDS. The aim is to create and sustain an environment that encourages appropriate feeding practices for all infants, while scaling-up interventions to reduce HIV transmission.



(WHO/UNICEF/UNFPA/UNAIDS/World Bank/UNHCR/WFP/FAO/IAEA)

Risk of HIV transmission through breastfeeding

- Exclusive breastfeeding (6 weeks – 6 months) ~ 4%
- Breastfeeding as usual (varying duration) 5-20%

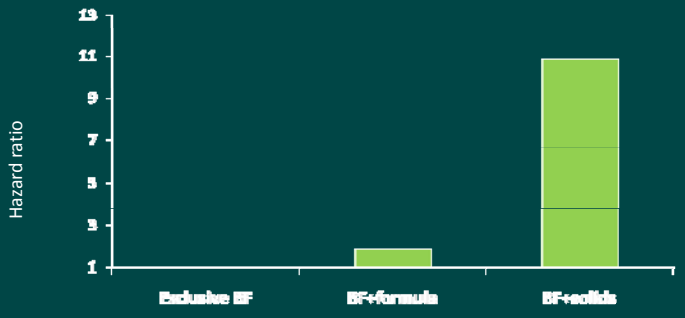
Timing of HIV transmission via breastfeeding

- HIV transmission possible at any time
- Rate of HIV infection is cumulative from 4-6 weeks to 18 months, about 1% per month of breastfeeding
- Some evidence that risk of transmission is higher in early life:
  - But, difficult to differentiate intrapartum from post-partum transmission
  - Probability of infection not significantly different for infants less than vs older than 4 months
- No evidence that colostrum carries different risk than mature milk

Pattern of infant feeding as risk factor for postnatal HIV transmission

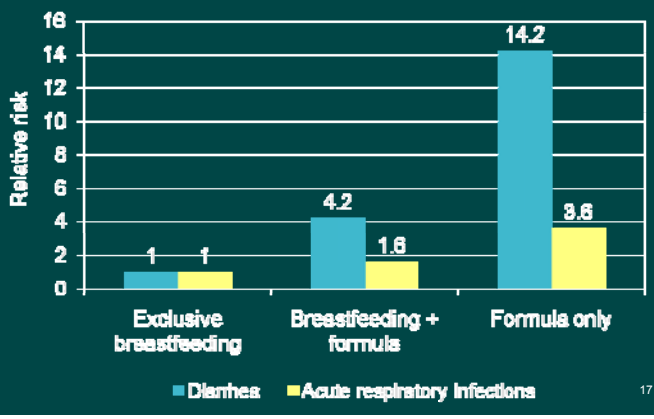
- Exclusive breastfeeding
  - Carries lower risk of HIV transmission than mixed breastfeeding
- Duration of breastfeeding
  - Early cessation of bf before 6 mths was associated with an increased risk of infant morbidity and mortality in HIV-exposed children
- Mixed feeding
  - Carries higher risk than exclusive breastfeeding

Exclusive breastfeeding up to 6 months carries a lower risk of HIV transmission than mixed feeding (South Africa)



Coovadia et al., *Lancet*, 2007

Relative Risk of Mortality from Diarrhea and ARI by Mode of Feeding



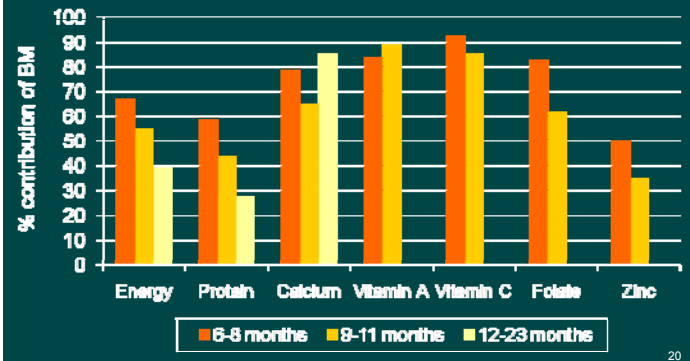
Improving infant feeding practices

- Consistent messages and frequent counselling improved adherence and longer duration of exclusive breastfeeding up to 6 months.

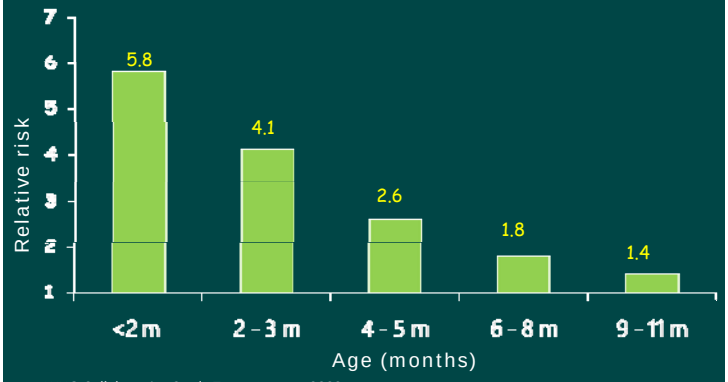
Health benefits of breastfeeding

- General population: lower risk of infectious disease mortality, malnutrition
- HIV-exposed: little difference in morbidity/mortality at 2 years between breastfed and formula fed in Kenya, but higher mortality in first months in formula-fed in Botswana, not significantly different at 18 months
- HIV-infected: breastfeeding beyond 4 months associated with higher survival

Nutrition Contribution of Breastmilk in Resource-Limited Settings



Relative risk of infectious disease mortality among non-breastfed infants



WHO Collaborative Study Team, *Lancet*, 2000

Determining Infant Feeding Policy by Infant Mortality Rate

Infant mortality rate	Infant feeding recommendation
< 25/1000 live births	Replacement feeding by HIV-positive mothers from birth
> 25/1000 live births	Exclusive breastfeeding to 6 months followed by early cessation

Antiretrovirals during breastfeeding

- Increasing evidence that ARVs to breastfeeding mothers who need them for their own health brings low rates of breastfeeding transmission. (Women who need ARVs for their own health during breastfeeding period should receive them, *but not recommended as strategy solely for reducing postnatal transmission)*
- Safety and efficacy of this approach for mothers in whom ART not indicated and their babies still being evaluated in 2008

WHO infant feeding recommendations – including in emergencies *(HIV-negative and status unknown)*

- Infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health
- Thereafter, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues up to 24 months or beyond

Modified Recommendations for HIV-positive women

- Most appropriate infant feeding option for HIV-exposed infant depends on individual circumstances, *including consideration of health services, counselling and support available*
- Exclusive breastfeeding for first *six* months of life recommended if replacement feeding not AFASS:
  - *A*cceptable
  - *F*easible
  - *A*ffordable
  - *S*ustainable *AND*
  - *S*afe
- If AFASS, then replacement feed from birth
- Repeated assessments, including at time of early infant diagnosis and at six months

Infant feeding options

- Exclusive breastfeeding: HIV transmission lower than with mixed feeding; high rates achievable with good counselling and support
- Replacement feeding: no risk of transmission, but HIV-free survival at 18 months not higher than for breastfeeding in many settings
- Other options as appropriate in local circumstances:
  - Expressed, heat-treated breast milk (useful during transition period)
  - Wet-nursing
  - Milk banks
- Replacement feeding with home-modified animal milk not recommended during first six months
- All infants need additional/replacement foods from six months

Balancing risks for HIV-positive women

Selecting an option: AFASS

To be a better option for the individual than exclusive breastfeeding, replacement feeding has to be ***AFASS***:

- ***A***cceptable
- ***F***easible
- ***A***ffordable
- ***S***ustainable ***AND***
- ***S***afe

For the mother and baby

ACCEPTABLE

The mother perceives no barrier, cultural or social, to replacement feeding and has no fear of stigma. She will be able to cope with pressure from family and friends to breastfeed.

- While some formula feeding is "acceptable" in many Asian countries, is *total* avoidance of breastfeeding "acceptable"?
- In Sao Paolo, Brazil, all HIV-positive mothers given free formula, considered acceptable, but 12% still breastfed.

FEASIBLE

The mother has adequate time, knowledge, skills and other resources to prepare the replacement food and feed the infant up to 12 times in 24 hours.

- Need for reasonable home infrastructure and family support, especially for night feeds.
- Do mothers have extra time to prepare formula when it's *only* food infant will have for first 6 months?

AFFORDABLE

The mother and family can purchase formula, including all ingredients, fuel, clean water, soap and equipment, without compromising the health and nutrition of the family, and also possible increased medical costs.

- If provided for free, can government/NGOs afford to give formula to all HIV-positive women for as long as infant needs it?
- If not free, what if circumstances change in the first six months?

SUSTAINABLE

Availability of a continuous and uninterrupted supply and dependable system of distribution of formula for as long as the infant needs it.

- If provided for free, will supply system be able to cope?
- Will mother always be able to find it when needed?

SAFE

Replacement foods are correctly and hygienically prepared and stored, and fed in nutritionally adequate quantities, with clean hands and with clean utensils, preferably by cup.

- Is there a safe water supply? Can water be hot each time (to prevent *e sakazaki*)?
- Home-modified animal milk no longer considered *safe* for entire first 6 months of life.

Pre-conditions for supplying formula

- Code implemented to prevent "spillover"
- Formula only to HIV-positive women where other AFASS conditions met
- Clear guidelines available
- Counselors trained
- Health and nutritional status of infants monitored
- Supplied for as long as infant needs it

Supporting a mother to choose and implement an option: Before delivery and in the first months

- Counselling based on definition of AFASS for her and her baby
- 2 main options (replacement feeding and exclusive breastfeeding for 6 months), with other local options discussed only if mother interested
- Support for decision
- Counselling and support by trained staff or community workers with appropriate skills and competencies

Supporting a mother when practices change at 6 months

- If still breastfeeding:
  - if other milks, animal source-foods available – cease all breastfeeding and give other foods
  - no such foods available – risk of mixed feeding for a few months probably less than risk of severe malnutrition
- If breastfeeding already stopped:
  - Continue with milk of some kind and complementary foods
- Continued support for decision

Challenges

HIV and infant feeding in emergencies

- Protecting and promoting exclusive breastfeeding (where HIV status unknown; mother HIV neg; mother HIV-infected but AFASS not possible)
- AFASS no longer possible after acute onset emergency
  - Feeding support for infants established on replacement feeds
  - Protecting and promoting exclusive breastfeeding of newborns

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