Vote YES for
BREAST FEEDING
Louise Kuhn, Ph.D.
Columbia University
Mailman School of Public Health
New York, NY
The 2010 Revolution: Antiretroviral drugs work to prevent mother-to-child HIV transmission

- Intrauterine transmission
- Intrapartum transmission
- Breastfeeding transmission
The group considered that the effectiveness of ARVs to reduce HIV transmission through breastfeeding is transformational. In conjunction with the known benefits of breastfeeding to reduce mortality from other causes, it justifies an approach that strongly recommends a single option as the standard of care.
Transmission rates among women breastfeeding to 6 months in MmaBana Study, Botswana

1.1%

Post-partum
0.28%

Shapiro et al. NEJM 2010; 362: 2282-2294
The future’s so bright ... I’ve gotta wear shades

ARVs work to prevent breastfeeding transmission
Breastfeeding transmission rates by 6 months

ARVs reduce transmission by 73-96% (the studies)

% TR at 6 months

- DREAM: 0.6%
- Mitra Plus: 0.9%
- Amata: 0.6%
- KIBS: 1.1%
- MmaBana: 0.3%
- No ARVs: 6.0%

Courtesy: Lynne Mofenson
Look carefully at the numbers they matter

ARVs work to prevent breastfeeding transmission and save their mothers’ lives
New guidelines for prevention of mother-to-child HIV transmission with antiretroviral drugs

HIV-infected pregnant women

Low CD4 count <350
- Antiretroviral Therapy
  - Improve maternal health
  - Prevent transmission

High CD4 count >350
- Short-course plus Extended infant prophylaxis
  - Prevent transmission
- Triple drug prophylaxis
  - Prevent transmission

Either OR
The 2010 revolution had three parts

New recommendations available at:
http://www.who.int/hiv/en/
PMTCT requires coordinated efforts across the health service
CD4 count strongly predicts which children will acquire HIV via breastfeeding

What would happen if only those running adult treatment services did their job properly?

- CD4>350
  - Coverage=0%
- CD4<350
  - Coverage=100%
- Maternal Therapy
  - TR=2%

Legend:
- PP
- Maternal Therapy
- Coverage
I’d like to be an optimist but I don’t think it’ll work out
Survival of HIV-infected Children with Positive Results before 4 Months of Age by Group Assignment

Early cessation of breastfeeding is harmful to HIV-infected children

Group A - stopped BF

Group B - Still BF

P = 0.01

Mortality caused by early weaning canceled out HIV transmission prevented

Clean water, good sanitation, education and health services reduce but do not eliminate adverse effects of abstinence from breastfeeding.


Thior I, Lockman S, Smeaton LM et al. *JAMA* 2006; 296: 794-805
Adjusted HR for Mortality (95%CI)

<table>
<thead>
<tr>
<th>Comparison</th>
<th>HR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not BF vs. Exclusive breastfeeding</td>
<td>9.09</td>
<td>(2.94-25.0)</td>
</tr>
<tr>
<td>Not BF vs. Mixed breastfeeding</td>
<td>2.70</td>
<td>(1.45-5.0)</td>
</tr>
</tbody>
</table>

Survival in the First 6 Months of Life
Vertical Transmission Study, South Africa

Cumulative mortality according to initial infant feeding type (%)

Coovadia H et al. Lancet 2007
Face Facts:
Avoiding breastfeeding is dangerous
Breastfeeding protects against infectious diseases

<table>
<thead>
<tr>
<th>Duration of Breastfeeding</th>
<th>≤6 mo, OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>URTI</td>
</tr>
<tr>
<td>Never breastfed</td>
<td>1.00</td>
</tr>
<tr>
<td>Exclusively for 4 mo, partially breastfed thereafter</td>
<td>0.65 (0.51–0.83)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Exclusively breastfed for 6 mo</td>
<td>0.37 (0.18–0.74)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>p</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

Duijts et al. Pediatrics 2010; 126: e18
Breastfeeding protects against infectious disease hospital admissions during the first 8 months after birth.

<table>
<thead>
<tr>
<th>Infant Feeding</th>
<th>Monthly Prevalence, % (n/N)</th>
<th>Crude OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not breastfed</td>
<td>0.18 (158/86 648)</td>
<td>1.00</td>
</tr>
<tr>
<td>Partially breastfed</td>
<td>0.08 (17/19 887)</td>
<td>0.46 (0.24–0.88)</td>
</tr>
<tr>
<td>Exclusively breastfed</td>
<td>0.05 (11/20 352)</td>
<td>0.28 (0.14–0.58)</td>
</tr>
<tr>
<td>LRTI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not breastfed</td>
<td>0.49 (429/86 648)</td>
<td>1.00</td>
</tr>
<tr>
<td>Partially breastfed</td>
<td>0.25 (50/19 888)</td>
<td>0.50 (0.36–0.71)</td>
</tr>
<tr>
<td>Exclusively breastfed</td>
<td>0.30 (60/20 352)</td>
<td>0.60 (0.44–0.81)</td>
</tr>
</tbody>
</table>

### US Agency for Healthcare Research & Quality (AHRQ), 2007

- Breastfeeding and Maternal and Infant Health Consequences in Developed countries


<table>
<thead>
<tr>
<th>Exposure</th>
<th>Effect in full term infants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Respiratory Tract Infection Risk of hospitalization in &lt; 1yr if EBF ≥4m</td>
<td>72% (95% CI 46% to 86%)</td>
</tr>
<tr>
<td>Diarrhea Ever BF vs never BF</td>
<td>64% (95% CI 62% to 68%)</td>
</tr>
<tr>
<td>Acute Otitis Media Ever BF vs no BF</td>
<td>23% (95% CI 9% to 36%)</td>
</tr>
<tr>
<td>Asthma- w FH BF ≥3m; risk of asthma ≤ 10yr</td>
<td>40% (95% CI 18% to 57%)</td>
</tr>
<tr>
<td>Atopic Dermatitis BF ≥3m</td>
<td>42% (95% CI 8% to 59%)</td>
</tr>
<tr>
<td>Childhood Obesity Various BF exposures</td>
<td>24% (95% CI 14% to 33%)</td>
</tr>
<tr>
<td>SIDS Ever vs. Never</td>
<td>36% (95% CI 19% to 49%)</td>
</tr>
</tbody>
</table>
US National Maternal and Infant Health Survey (n=8944)

• Ever BF ↓ postnatal deaths by 21% (RR 0.79, 95%CI: 0.67,0.93)
• If BF > 3m: postnatal deaths ↓ by 38%
• Low uptake of BF among African Americans is one of the reasons for racial disparities in infant mortality in the US

Chen & Rogan. Pediatrics 113: 435-9, 2004
Association between BF and IQ moderated by genetic variant in FADS2 (gene encoding the rate limiting enzyme in metabolic pathway leading to AA and DHA production).
Evolution of lactation

Milk: 200 million years of evolution can’t be wrong
Breast milk is not just food

Developmental Changes in Immunoglobulin levels

Adapted from Stiehm [ed] Immunologic Disorders of Infants and Children, 1989
Just because it’s expensive doesn’t mean it’s good for you.
2010 was a good year
ARVs work to prevent mother to child HIV transmission
What's the catch with antiretrovirals?

• Cost?
• Toxicity?
• Drug resistance?

You gotta take 'em
Is an IMR below 25/1000 a "safe" threshold for formula?
A numerical example using current transmission rates with ARVs

HIV + Uninfected deaths among formula feeders =
\[ TR_{IU1P} + (1-TR_{IU1P}) \times IMR \times RR \]

HIV + Uninfected deaths among breast feeders =
\[ TR_{IU1P} + TR_{PP} + (1-TR_{IU1P}-TR_{PP}) \times IMR \]

\[ TR_{IU1P}=2\% \quad TR_{PP}=1\% \quad IMR=10/1000 \quad RR=2 \]

For every 1000 Formula feeders
20 HIV infections + 20 Uninfected deaths

For every 1000 Breast feeders
30 HIV infections + 10 uninfected deaths
The risk-benefit balance of artificial feeding vs. breastfeeding is shifted with ARVs.

HIV is treatable.
You need balance.

Unbiased information is needed about safety of formula ARVs, not false hopes about benefits. Pessimism about ARVs is not helpful.
Just say YES to …

… drugs and breastfeeding

Yes to health CARE
No to unhealthy commodities
It’s not funny