Substantial data exists to support the opinion that optimising infant feeding is a public health priority in well-resourced and resource-limited settings.

The developmental origins of adult disease (Barker) hypothesis is supported by data from varied settings and shows a strong relationship between low birth weight, small head circumference, low ponderal index, high growth rate in the first two to three years of life and adult diseases, such as coronary heart disease, diabetes, cancer, chronic lung disease, polycystic ovarian disease and psychological outcomes (Be Boo, 2006; Dover, 2009). High or forced growth rate is associated with adult onset hypertension and type II diabetes.

Furthermore, in resource-limited settings the vicious cycle of malnutrition and infection fuels infant mortality and hinders attainment of the fourth Millennium Development Goal (Katona, 2008).

Thus, early infant growth and nutrition influence infant and adult health in well-resourced and resource-limited settings, and is therefore of paramount importance.

Pattern of feeding (see Figure 1) is a significant predictor of child morbidity and mortality (Black, 2008).

A random-effects meta-analysis conducted by the Maternal and Child Undernutrition Study Group found significantly increased risks of all-cause mortality and pneumonia incidence amongst predominantly breastfed infants (PredBF) aged zero to five months compared with exclusively breastfed infants (EBF); significantly increased risks of all-cause mortality, pneumonia mortality, diarrhea incidence and pneumonia incidence amongst partially breastfed infants (ParBF) aged zero to five months compared with EBF infants; significantly increased risks of all-cause mortality, diarrhea mortality and diarrhea incidence in not breastfed infants aged zero to five months compared with EBF, and significantly increased risks of all-cause mortality and diarrhea incidence amongst infants aged six to 23 months who were not breastfed compared with those who received any breast milk (Black, 2008).

Figure 2 shows the detailed risk ratios from the article by Black et al. (2008).

Despite these benefits, ten years ago there was grave concern that breastfeeding fuels postnatal mother-to-child transmission of HIV. Thus, HIV positive mothers in Sub-Saharan Africa and many other Commonwealth countries were advised not to breastfeed or to stop breastfeeding early.

### WHO definitions of infant feeding patterns

<table>
<thead>
<tr>
<th>Exclusive breastfeeding (EBF)</th>
<th>Giving the infant breast milk only, and any minerals, vitamins and prescribed medicines if needed, for the first six months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed breastfeeding (MBF)</td>
<td>Giving the infant breast milk and other fluids and solids. MBF may be further classified into predominant breastfeeding (PredBF) and partial breastfeeding (ParBF):</td>
</tr>
<tr>
<td></td>
<td>– Predominant breastfeeding means giving the infant breast milk and non-nutritive liquids</td>
</tr>
<tr>
<td></td>
<td>– Partial breastfeeding means feeding breast milk and non-nutritive and nutritive liquids and solids</td>
</tr>
<tr>
<td>Exclusive formula feeding (EFF)</td>
<td>Giving the infant only commercial infant formula milk for the first six months of life</td>
</tr>
<tr>
<td>Replacement feeding (RF)</td>
<td>Refers to the process of feeding a child, who is not receiving any breast milk, a diet that provides all the nutrients the child needs until the child is fully fed on family foods. During the first six months, a suitable breast milk substitute should be used and subsequently complementary foods made from appropriately prepared and nutrient-enriched family foods should be added</td>
</tr>
</tbody>
</table>
Pattern of breastfeeding is associated with vertical HIV transmission: mixed breastfeeding carries the highest risk of transmission and exclusive breastfeeding the lowest (Coo advia, 2007; Kuhn, 2007). The risks of avoiding breastfeeding, even in high HIV prevalence settings, were higher than the risks of HIV transmission.

Early breastfeeding cessation was associated with high mortality, higher diarrhoea incidence and diarrhoea-related mortality despite HIV exposure (Creek, 2010; Kuhn, 2005).

Few (seven to 42 per cent) of breastfeeding HIV-positive women practiced EBF, despite advice to do so. By 12 weeks, ParBF was commoner than PredBF.

Amongst non-breastfeeding HIV positive women 67 per cent of them fed their infants formula milk and other nutritive and non-nutritive liquids and solids i.e. they practiced non exclusive formula feeding which is deleterious for child health.

Additionally, incorrect feeding choices amongst HIV positive women is associated with a higher risk of HIV transmission or death by 36 weeks post-delivery (Doherty, 2007).

The Bellagio child survival study group found sufficient evidence to suggest that breastfeeding protects against diarrhoea, pneumonia and neonatal sepsis. Modelling conducted by the group further estimated that 90 per cent coverage with EBF for six months, and continued breastfeeding for up to one year, would prevent 13 per cent of under-five deaths globally, even in the context of HIV (Jones, 2003).

The benefits of breastfeeding with antiretroviral (ARV) prophylaxis should be weighed against the risks of HIV transmission through breastfeeding. The World Health Organization (WHO) currently recommends that national or sub-national authorities should decide whether health services will principally counsel and support HIV-infected mothers to breastfeed and receive ARV interventions, or avoid all breastfeeding, to improve HIV-free survival. WHO further advises that HIV-infected mothers should only give commercial infant formula milk as a breast milk substitute when specific conditions are met.

Simple, consistent approaches and tools for infant feeding in the context of HIV have been developed but routine challenges exist, including poor quality or lack of counselling, poor support for continued infant feeding, incorrect and poor application of tools to identify women who could avoid all breastfeeding, and mixed messages around infant feeding. Health care providers in many countries still incorrectly advise mothers to:

- Introduce fluids such as water, glucose water, tea or formula milk in the first few weeks of life
- Introduce solids at three to four months post-delivery
- Breastfeed for ten minutes on a breast and then change over
- Breastfeed according to a strict schedule

Such misinformation reduces the prevalence of breastfeeding initiation, continuation and exclusivity.

Several other factors affect early infant feeding. These include:

- The provision of breast milk substitutes as part of a protein energy malnutrition scheme without a concerted effort/campaign to promote breastfeeding. Such an approach legitimises the use of commercial infant formula, reducing the prevalence of any breastfeeding and exclusive breastfeeding
- Non-adoption of the International Code of Marketing of Breast-milk Substitutes: this facilitates uncontrolled marketing of breast milk substitutes
- Lack of dedicated support and counselling to promote appropriate infant feeding at health facility and household levels

Data shows that peer counsellors can increase the prevalence of exclusive breastfeeding in Africa, America and Asia (Haroon, 2013; Skouteris, 2014). A multi-country community-based cluster randomised trial on breastfeeding promotion found that EBF prevalence (amongst mothers intending to breastfeed) at 12 weeks in intervention and control clusters was: 77 per cent vs 23 per cent.

### Figure 2 Sub-optimal breastfeeding risks

Risk associated with sub-optimum breastfeeding compared with exclusive breastfeeding, from zero to five months, and any breastfeeding, from six to 23 months.*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>0–5 months</th>
<th>6–23 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Predominant breastfeeding</td>
<td>Partial breastfeeding</td>
</tr>
<tr>
<td>All-cause mortality</td>
<td>1.48 (1.13–1.92)*</td>
<td>2.85 (1.59–5.10)*</td>
</tr>
<tr>
<td>Diarrhoea mortality</td>
<td>2.28 (0.85–6.11)</td>
<td>4.62 (1.81–11.77)*</td>
</tr>
<tr>
<td>Pneumonia mortality</td>
<td>1.75 (0.48–6.43)</td>
<td>2.49 (1.03–6.04)*</td>
</tr>
<tr>
<td>Diarrhoea incidence</td>
<td>1.26 (0.81–1.95)</td>
<td>3.04 (1.32–7.00)*</td>
</tr>
<tr>
<td>Pneumonia incidence</td>
<td>1.79 (1.29–2.48)*</td>
<td>2.48 (0.23–27.15)</td>
</tr>
</tbody>
</table>

* Significant difference

Source: Black, 2008

Subsequent data showed that:

- Pattern of breastfeeding is associated with vertical HIV transmission: mixed breastfeeding carries the highest risk of transmission and exclusive breastfeeding the lowest (Coo advia, 2007; Kuhn, 2007). The risks of avoiding breastfeeding, even in high HIV prevalence settings, were higher than the risks of HIV transmission.
- Early breastfeeding cessation was associated with high mortality, higher diarrhoea incidence and diarrhoea-related mortality despite HIV exposure (Creek, 2010; Kuhn, 2005).
- Few (seven to 42 per cent) of breastfeeding HIV-positive women practiced EBF, despite advice to do so. By 12 weeks, ParBF was commoner than PredBF.
- Amongst non-breastfeeding HIV positive women 67 per cent of them fed their infants formula milk and other nutritive and non-nutritive liquids and solids i.e. they practiced non exclusive formula feeding which is deleterious for child health.
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in intervention vs control cluster, Burkina Faso (prevalence ratio 3.27, 95 per cent confidence interval 2.13, 5.03); 77 per cent vs 34 per cent in intervention vs control clusters, Uganda (prevalence ratio 2.30, 95 per cent confidence interval 2.00, 2.65); and eight per cent vs four per cent in intervention vs control clusters, South Africa (prevalence ratio 1.98, 95 per cent confidence interval 1.30, 3.02).

Therefore, to improve infants’ feeding practices, and long-term infant and adult outcomes, the following actions are needed:

- Infant feeding messages need to be clear and consistent across all levels of health care personnel
- HIV-positive women need to be seen as a group with special needs and counselling should be tailored to each individual mother-baby pair
- Peer counselling/community support for breastfeeding and appropriate infant feeding needs to be intensified
- The International Code of marketing of Breast-milk Substitutes needs to be legislated in all countries
- All malnutrition schemes should be implemented hand in hand with breastfeeding support programmes

These steps will result in child survival gains and improved long-term health outcomes from infancy to adulthood.

References


Goga, A. E., Doherty, T., Jackson, D. J. et al., 2012. ‘Infant feeding practices at routine PMTCT sites, South Africa: results of a prospective observational study amongst HIV exposed and unexposed infants – birth to 9 months’. International breastfeeding journal, 7, p. 4.


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