Special acknowledgement for the support on compilation:

**Pulani Lanerolle B.Sc, PhD.**
Professor in Nutrition  
Department of Biochemistry and Molecular Biology  
Faculty of Medicine  
University of Colombo

**Maduka de Lanerolle Dias B.Sc, PhD.**  
Senior Lecturer  
Department of Biochemistry and Molecular Biology  
Faculty of Medicine  
University of Colombo

**Indu Waidyatilaka MBBS, M.Sc, PhD.**  
Senior Lecturer  
Department of Biochemistry and Molecular Biology  
Faculty of Medicine  
University of Colombo
EXECUTIVE SUMMARY

The key findings of the 2016 Sri Lanka Demographic and Health Survey (SLDHS) indicate that 17% of children under 5 years were stunted, 15% were wasted and 21% were underweight. These figures do not show a significant improvement from the 2006 SLDHS survey findings. When comparing the national infant and young child feeding (IYCF) strategy objectives alongside the trends in SLDHS data for IYCF from 2006 to 2016, significant improvements are observed in breastfeeding and to a lesser extent in complementary feeding. Other national level surveys and the small local studies confirm these findings. However, these improvements do not appear to have impacted on the stagnant nutrition indices which are present despite a general improvement in the economy reflected by an increasing GDP over this period. An examination of current evidence is required to identify whether a change in strategy is required to address this “last mile” in improving both IYCF practices as well as nutrition indices in the country.

This desk review was carried out of all available published literature and unpublished communications related to infant and young child feeding (IYCF) practices in Sri Lanka, with a greater focus on complementary feeding, in order to inform potential policy changes. No assessment of quality of study design and exclusion or grading of studies was made as the intention was to collect as much data as possible of factors that influence complementary feeding including barriers focusing on an analysis of qualitative-type information.
Global and regional best practices indicate that better complementary feeding practices result in better nutrition indices, and this forms the basis for the current global guidance for IYCF practices and the national IYCF strategy. Available literature in both breastfeeding and complementary feeding indicates that there is a small proportion of infants who do not receive optimum care. Currently, no analysis is available of national data which evaluates if the same infants also have poor nutrition indices. However, proxy evidence from limited intervention studies and small scale programmes indicate that correct feeding practices result in improvement in nutrition status of young children. Collectively this data suggests that in order to improve nutrition status, it is necessary to provide targeted support to those infants who are either growth faltering, malnourished or are of low birth weight. These infants are scattered across the country; even the areas with better statistics have some infants who need extra care although sector and district disparities may account for some of these statistics. The current national growth monitoring and IYCF programme places a heavy emphasis on the role of the Public Health Midwife (PHM) in identifying infants at risk, with training programmes for health care workers also in place. However effective targeting requires that the PHM is better trained to identify those at risk, using the routine growth monitoring data of individual infants and provide individualized care and appropriate referral. In order to empower the PHM, clear messages need to be developed and skills in behavior change communication (BCC) and problem solving need to be provided. Limited time available to the PHM and the need to create motivational factors were observed. This review also identifies specific barriers and areas in complementary feeding practices that need to be focused on in such BCC.

With the increase in gross domestic product (GDP) with time, the expected reduction in prevalence of stunting, underweight and wasting is not observed. Income disparity and the gap in wealth distribution have not improved. Rapid unplanned urbanization and nutrition transition in the last decade has resulted in a lifestyle change as well as a changing food environment. While food insecurity is still present in a minority due to reduced access to good quality foods, access to poor quality micronutrient poor high energy foods has increased. Therefore, there is a need to create value addition to good quality foods in order to counter the effects of advertising. Poor access to facilities related to water, sanitation and hygiene (WASH) are also observed in a minority. There is inadequate data investigating the effects of these factors in children who are undernourished. Further, the relative contribution of food access issues and wealth against feeding practices on poor nutrition status is not conclusive. There is evidence that social transfer systems are not adequately targeted. Agricultural support and legislative support to create an enabling food environment needs to be improved. Providing supportive multi-sector care in addition to improved complementary feeding practices through BCC for identified at-risk groups is essential. Multi-sector actions are also required for the general population to improve access to quality foods and to empower the community to seek appropriate foods and care. Mass media and the private sector has an identified role in creating enabling environments.

Sri Lanka has many stakeholders’ other than the Ministry of Health currently involved in improving IYCF. However, coordination and streamlining of activities of these multiple stakeholders is essential. The major lessons that can be learnt
from the success in breastfeeding are: a clear message is needed, legislation must support policy, cultural taboos as well as weaknesses must be identified and addressed directly and correct feeding practices require “value addition”.

This review identifies the specific aspects of complementary feeding including barriers and factors that need to be improved based on local evidence, in relation to global evidence of best practices and also identifies gaps in the literature in order that future studies can be designed to address the relevant questions, as simple cross-sectional prevalence studies are no longer able to add new information which can impact on policy.
# Table of Contents

EXECUTIVE SUMMARY ........................................................................................................... 3

Table of Figures ....................................................................................................................... 10

1. INTRODUCTION .................................................................................................................. 11

1.1 Nutrition indices and complementary feeding practices .................................................... 11
    1.1.1 South Asia within the global context .............................................................................. 11
    1.1.2 Cross region comparisons of IYCF practices ................................................................. 12
    1.1.3 Addressing the double burden ..................................................................................... 14
    1.1.4 Complementary feeding in South Asia: Sri Lanka in the South Asian context ............... 15

1.2 Factors that affect complementary feeding ........................................................................ 17
    1.2.1 Composition of complementary meals ......................................................................... 18
    1.2.2 Optimum feeding practices .......................................................................................... 20
    1.2.3 Delivery of information, education and communication (IEC): BCC programmes, types of care providers and barriers ............................................................. 20
    1.2.4 Complementary feeding programmes at scale and the need for multiple strategies ... 23

2. OBJECTIVES ....................................................................................................................... 25

2.1 General Objective ............................................................................................................. 25

2.2 Specific objectives: ........................................................................................................... 25

3. METHODS ........................................................................................................................... 26

4. REVIEW FRAMEWORK FOR ANALYSIS OF LOCAL DATA ............................................. 28

5. EVIDENCE ON IYCF FROM SRI LANKA ......................................................................... 30

5.1 Available data on IYCF..................................................................................................... 30

5.2 The local background context .......................................................................................... 31
    5.2.1 How do SLDHS prevalence trends compare with the national IYCF strategy objectives? 33
    5.2.2 Special /Vulnerable populations and infants ................................................................. 36

5.3 Policy and leadership ....................................................................................................... 42

5.4 Legislative support for the promotion of breastfeeding and correct complementary feeding ................................................................................................................ 42

5.5 Multi-sector input and funding for IYCF activities ............................................................ 43

5.6 Multi-sector interventions: health and non-health ........................................................... 44
    5.6.1 Non-health sector interventions .................................................................................... 44

5.6.1.1 Access to appropriate food: food security and availability of quality foods

5.6.1.2 Mother’s education and wealth

5.6.1.3 WASH coverage in Sri Lanka

5.6.1.4 Social Security programmes

5.6.1.5 Agriculture: linking with IYCF

5.6.1.6 Use of mass media to promote the importance of enabling environments for IYCF

5.6.2 Health sector interventions

5.6.2.1 Well baby clinics: immunization and growth monitoring

5.6.2.2 Supplementation and Fortification

5.6.2.3 Promoting breast feeding: knowledge and practices and the baby friendly hospital initiative

5.6.2.4. Challenges regarding on-demand breast feeding after 6 months and after 12 months

5.6.2.5. Improving complementary feeding

5.6.2.5.1 Improving complementary feeding to improve nutrition indices

5.6.2.5.2. Knowledge regarding complementary feeding

5.6.2.5.3. Addressing inappropriate feeding practices

5.6.2.5.4. Responsive feeding practices

5.6.2.5.5. Improving responsive feeding

5.6.2.5.6. Challenges in responsive feeding

5.6.2.5.7. Cultural practices and feeding during illness:

5.7 Behavior change communication (BCC)

5.7.1 Suggestions based on successful BCC programmes

5.7.2 Training of health care personnel and work load

5.7.3 Community mobilization: Caregiver/ Mothers support groups

5.8 Using routine growth monitoring to identify and intervene in the infant at-risk

5.9 Monitoring and evaluation of programmes and research

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Main conclusions and recommendations from breastfeeding studies

6.2 Main conclusions and recommendations from complementary feeding data
6.3 Behaviour change communication programmes...........................................83
6.4 The gap in literature.....................................................................................83
ANNEXURE 1: Sri Lanka Strategy Objectives for IYCF..................................86
ANNEXURE 2 - Selected Case Studies from Sri Lanka and the region ........88
REFERENCES..................................................................................................99
Table of Figures

Figure 1: Regional prevalence of stunting, wasting and severe wasting in children under the age of 5 .......................................................... 12

Figure 2: The place of South Asia in relation to other regions where inadequate IYCF is an issue .......................................................... 13

Figure 3: Complementary feeding indices in infants and young children in South Asia. 15

Figure 4: Comparison of prevalence of Stunting and Wasting in Sri Lanka vs South Asia ..................................................................................................... 16

Figure 5: Complementary feeding practices for infants and young children in South Asia ..................................................................................................... 17

Figure 6: Model for the development of behavior change programmes to improve complementary feeding practices ..................................................................................................... 23

Figure 7: Local data were analysed based on the following framework .......................... 29

Figure 8: Nutrition status of children under five (%), 2006-07, 2009 and 2016 ............... 32

Figure 9: Selected Objectives from the national strategy for IYCF (2015-2020) vs progress to-date .......................................................... 35

Figure 10: Prevalence of stunting in children aged 6 – 59 months of age by district ....... 37

Figure 11: Prevalence of mild and moderate anaemia in each district .......................... 38

Figure 12: Trends in the prevalence of anaemia in children age 5 = 59 month ............. 50

Figure 13: Nutritional status of under five children by age groups .......................... 59

Figure 14: Percentage of children consuming foods rich in vitamin A and iron by age groups (months) .......................................................... 62

Figure 15: Percentage of children with a minimum acceptable diet, including Minimum Meal Frequency and Minimum Dietary Diversity .......................................................... 62

Figure 16: Ways of Persuading at 12-23 months of age (%) .......................................... 65

Figure 17: Common hunger cues identified by the caregiver, of children aged 6 – 12 months and 12 – 23 months .......................................................... 66

Figure 18: Use of IEC material .................................................................................. 73

Figure 19: Common IEC material used ..................................................................... 74
1. INTRODUCTION

“Improving child and maternal nutrition is not only entirely feasible but also affordable and cost-effective. Nutrition interventions are among the best investments in development that countries can undertake” (UNICEF 2009)

1.1 Nutrition indices and complementary feeding practices

1.1.1 South Asia within the global context

While global prevalence of stunting and wasting is 22.9% and 7.7%, a majority of these children live in South Asia (UNICEF, WHO, WBG, 2017). Despite every healthy child having equal growth potential, global estimates show that one in every 5 children exhibit stunted growth, mainly due to chronic nutrition deprivation in children under 5 years of age. Figure 1 shows that the prevalence of stunting (35.8%) and wasting (16%) is highest in South Asia compared to other regions and comparable to sub-Saharan Africa, with a majority of stunting occurring during the complementary feeding period of 6 to 23 months. In Sri Lanka, having reduced its infant mortality, the focus needs to be on those surviving on marginal nutrition status. Stunting, underweight and wasting is often accompanied with micronutrient deficiency and anaemia. Stunting is associated with poor cognition and educational performance in childhood, reduced productivity and earning potential in adulthood and when accompanied by excessive weight gain in later childhood increases the risk of chronic disease (de Onis and Branca, 2016).
**1.1.2 Cross region comparisons of IYCF practices**

The development of indicators for the assessment of IYCF has enabled cross country comparisons of IYCF practices (WHO, 2008a, 2008b) in efforts towards improving the situation in-line with the World Health Assembly resolutions on enhancing maternal and infant and young child nutrition (WHO, 2012). Figure 2 shows that although breastfeeding practices in South Asia are high compared to other regions, complementary feeding practices including the introduction of solid, semisolid and soft foods, diversity and adequacy are lower in comparison to other regions.


**Figure 2:** The place of South Asia in relation to other regions where inadequate IYCF is an issue

*Source: White et al 2017*
1.1.3 Addressing the double burden

The quality of growth is particularly important in the undernourished child and mere weight gain may not indicate optimum growth. The quality of growth as observed through body composition changes during optimal complementary feeding is an important new area of research which is particularly important in understanding the metabolism of the undernourished child and risk of future chronic disease. Thus, optimum nutrition can be delivered to all children including those who are undernourished, and those who are at risk of overweight without the negative consequences of inadequate micronutrients and excess energy through placing emphasis on increased dietary diversity. Emphasizing diversity and composition is as important as quantity in addressing the double burden of malnutrition, which is more prevalent in South Asia compared to other regions.
1.1.4 Complementary feeding in South Asia: Sri Lanka in the South Asian context

Aguayo (2017) reviews IYCF practices in South Asia (Figure 3) which indicates that compared to the other South Asian countries assessed, Sri Lanka records the highest prevalence values for having adequate diversity and quantity based on the Sri Lanka Demographic and health Survey (SLDHS) data (DCS, 2006). The countries that show the lowest performance in IYCF practices also document the poorest nutrition indices and the stunting rates are lower in Sri Lanka compared to the region. However, prevalence of wasting is not appreciably lower in Sri Lanka compared to the regional data (Figure 4).

**Figure 3:** Complementary feeding indices in infants and young children in South Asia.

![Graph showing complementary feeding indices in South Asia](image)

Source: Aguayo 2017
**Figure 4:** Comparison of prevalence of Stunting and Wasting in Sri Lanka vs South Asia

<table>
<thead>
<tr>
<th></th>
<th>Sri Lanka</th>
<th>South Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stunting (Moderate &amp; Severe)</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>Wasting (Moderate &amp; Severe)</td>
<td>20%</td>
<td>35%</td>
</tr>
<tr>
<td>Wasting (Severe)</td>
<td>5%</td>
<td>10%</td>
</tr>
</tbody>
</table>

*Source: UNICEF— the state of the world’s children 2017*

However, when the types of foods were assessed, all countries including Sri Lanka show that the main food fed is grains, while flesh foods, dairy, fruit and vegetable consumption is very low (Figure 5) (Aguayo, 2017). Therefore, there is much room for improvement in IYCF in Sri Lanka.
1.2 Factors that affect complementary feeding

Factors influencing complementary feeding include, creating an enabling environment through policy and leadership, service provision which includes multi-sector facilities such as health, agriculture and social support, and a multitude of caregiver factors. Intervention programmes to improve IYCF practices use BCC methods where both caregiver and health worker factors are important. Monitoring, evaluation and research will affect success of BCC programmes and ultimately affect feeding practices in the community. Discussed below are selected topics from international literature which addresses three important aspects of factors that affect complementary feeding which are particularly relevant to Sri Lanka, namely, composition of complementary feeds, responsive feeding and behavior change communication as a method for delivery of care.
1.2.1 Composition of complementary meals

Protein quality

The lack of flesh foods and dairy products in complementary foods is a cause for concern in South Asian countries. With regard to protein, both quantity and quality make a difference. Studies have looked at growth of the young child in relation to different types of protein. It has been documented that children who were stunted had lower plasma levels of essential amino acids (Semba et al., 2016). It is important to note that good quality proteins providing essential amino acids in adequate amounts are needed for optimum growth. At public health level this translates to including combinations of proteins in adequate amounts and ensuring that these sources are available at an affordable cost to the consumer. This also gives greater emphasis to the need for continued promotion of breast feeding during this early complementary feeding period while retaining the importance of traditional dairy foods such as yoghurt and curd. Due to the high cost and reduced availability of dairy and animal products cheaper protein sources have been often highlighted in relation to complementary feeding. Small fish, eggs, legumes and pulses are examples of lower cost animal and plant protein sources which can be promoted and will also increase dietary diversity. Increasing dietary diversity can also be considered a tool to increasing protein quality through the supplementary effect of mixtures of protein sources.

Energy and fats: quality and quantity

Addition of fat to complementary meals has been recommended in the past as a means of ensuring adequate energy content of the meal while reducing the bulk. The limited body of evidence suggests that the type of fat is important. The
essential fatty acids in n-3 and n-6 fats are important to the young child, and can be provided through fish, dairy and other animal foods as well as through ground nuts and certain vegetable oils. The understanding that increasing energy intake in the undernourished child needs to be done carefully, paying close attention to the source of energy due to the risk of overweight and future NCD has now been recognized. This is reflected in the new guidelines for supplementary foods in the moderately undernourished child, as supplementary foods often have a high fat content (WHO, 2017). Therefore, addition of fat to complementary foods needs to be revisited and reassessed on a context specific basis in different countries in relation to optimum growth quality. Fats that are added by incorporating animal and dairy foods are likely to both ensure increased fat and protein as well as increase diversity of the meal. Commercial products containing industrial trans fats need to be minimized.

**Carbohydrates**

Free sugar as well as sugar sweetened beverages must not be introduced before the age of 12 months and should be kept to a minimum even beyond, with complex carbohydrates being preferred for providing adequate energy. When dietary diversity increases and the variety of carbohydrate sources increases, providing adequate complex carbohydrates as well as fiber becomes easier. Placing importance on improving dietary diversity and thickness would help to ensure that the composition of complementary meals are optimal with respect to all nutrients.
1.2.2 Optimum feeding practices

**Responsive feeding**

The next important factor is how the child is fed. Responsive feeding is particularly relevant to complementary feeding. The theoretical basis of responsive feeding originates from responsive parenting and lies in the reciprocal interactions between both parent and child (Black and Hurley, 2017). There are well documented factors such as infection and poor sanitation and hygiene that influence whether the increased food provided results in improved growth. Optimal feeding will depend on how the child is fed in addition to what he or she is fed. The lack of responsive feeding can translate into excessive caregiver control through forceful or restrictive feeding or lack of caregiver control through indulgence, uninvolved or neglectful feeding. The direct negative impact on the infant leads to negative eating behavior in childhood and may track into adulthood. Internal hunger and satiety cues, self-regulation and social and emotional development in general and particularly related to eating, in the child, are all potentially affected through poor feeding practices with possible lasting effect (Michaelsen et al, 2017).

1.2.3 Delivery of information, education and communication (IEC): BCC programmes, types of care providers and barriers

Evidence for the potential effectiveness of IEC in improving complementary feeding in the South Asian context is sparse and is limited to small studies. Agauyo (2017) identified 12 intervention studies in Bangladesh, India and Pakistan which used IEC methods of which only 6 had a randomized study design and demonstrated improvement of practices.

This limited body of regional evidence shows that many types of care providers have been used in delivery including mother support groups (Kumar et al., 2017), trained village women, peer educators, trained project counselors, traditional births attendants, village-based workers, primary care physicians, community health workers and community counselors (Aguayo, 2017). While the findings across the studies were varied, it is seen that improvement can be achieved in the areas of improved meal quantity, amount per meal and time spent feeding. Mixed findings were observed with frequency, while some studies reported short term improvement, others failed at long term improvement. Both dietary diversity and responsive feeding practices improved in some studies.

Important aspects observed for success with BCC programmes included:

- Good practical skills on counseling and supervision
- Frequent counseling contacts,
- Incentives for counselors
- A supportive health system.

“Those who were trained in counseling were more likely to discuss age appropriate foods and check the mothers understanding using multiple opportunities. The use of existing health workers was shown to be feasible and while it did not disrupt existing services, served to enhance impact (Aguayo, 2017)”

Observed barriers to feeding flesh foods and improve diversity was availability and affordability. Aguayo (2017) highlights the importance of research that documents the main drivers of poor complementary feeding, particularly the pathways to overcome barriers and constraints to caregivers and families absorbing the recommendations.

1.2.3.1 Model for behavior change communication in IYCF

Sanghvi et al, (2017) studied successful behavior change approaches in 5 different settings searching for both commonalities and differences between these setting in order to design a model which can be used by others to develop programmes (Figure 6). They highlighted that IYCF can be improved using existing delivery programmes provided that the intervention focuses on the barriers to food access and also use effective methods to encourage caregivers to prepare and feed appropriately. It is evident that local research and formative work needs to be analysed. In this process existing practices needs to be mapped out and the largest gaps need to be prioritized which are also likely to be easily changed. Problem behaviours can be targeted. Underlying determinants such as access to foods and people or factors that strongly influence feeding behavior in a community need to be identified in the local context (Sanghvi et al, 2017).
1.2.4 Complementary feeding programmes at scale and the need for multiple strategies

Monitoring and evaluation needs to be built into any programme from the start. Multiple strategies involving multiple stakeholders are required which include the private sector who are responsible for food production (Aguayo, 2017). Agriculture is another obvious choice in multi-sector involvement as food availability is a significant barrier. Social transfer programmes and income generation methods also impact on access to foods. A sound situational analysis would serve as the basis for designing and implementing a strategy as well as cross cutting programmes. Community mobilization and volunteer participation could be untapped resources in many settings and have been demonstrated positively in some locations. National governments and development partners need to design, implement and document evidence based large scale programmes with inbuilt monitoring and evaluation. The mass media influence in shaping food choice is a significant factor that affects household food availability.
and needs to be addressed (Muehlhoff et al, 2017). Yet without concomitant national policies for IYCF that go hand in hand with food and nutrition security it is unlikely that an enabling environment to practice the recommendations will be created.
2. **OBJECTIVES**

2.1 **General Objective:**

To carry out a desk review of published and unpublished information on infant and young child feeding practices (IYCF) in Sri Lanka

2.2 **Specific objectives:**

1. Develop a review framework based on global and national recommendations on IYCF.


3. To describe the changes in the trend where possible

4. To identify gaps in knowledge
3. METHODS

Literature related to breast feeding, complementary feeding, infant feeding and IYCF practices in Sri Lanka was collected for the period from January 2006 to December 2017.

Among the key words used were: Sri Lanka, stunting, wasting, underweight, growth faltering and low birth weight, complementary feeding (and indicators), breast feeding (and indicators), infant and young child feeding, responsive feeding, feeding during illness, behavioral change communication, empowerment, training of trainers, mother support groups, food security, child welfare clinic and CHDR.

The PubMed search engine was used for an in-depth search of the key words in relevant combinations. Potentially relevant publications for the current review were identified. In addition, the search was carried out in handpicked Journals and Websites of Governmental and local Non-Governmental Organizations and international Non-Governmental Organizations. Handpicked Journals included The Ceylon Medical Journal, Sri Lanka Journal of Child Health, Sri Lanka Journal of community physicians, the Ruhuna Medical Journal, the Sri Lanka Journal of Medicine and the Journal of Maternal and child Health as well as published abstracts at scientific sessions of relevant colleges and Universities.

A search was also carried out using the Annotated Bibliography of Research reports, Dissertations and theses (MD, MSc, PhD) presented to the Post Graduate Institute of Medicine (PGIM), Colombo from 1982 - 2010, 2011 - 2013 and 2013 - 2015. All Research Reports, Dissertations and theses presented after 2015 were...

manually searched. All relevant documents were screened to identify relevant publications by three researchers independently.

Official websites of Governmental (Family Health Bureau, Ministry of Health, Department of Census and Statistics (DCS), Medical Research Unit (MRI), Ministry of Agriculture and Livestock Development) and Non-Governmental Organizations (World Health Organization, World Bank, United Nations Children’s’ Fund (UNICEF) and United Nations Development Programme (UNDP) were searched. All published data available in these institutions for the required period were perused.

All repositories found through the website of the National Science Foundation and repositories of all state Universities (University of Colombo Digital Archive, Open University of Sri Lanka Digital Archive, Ruhuna University Digital repository, Sri Jayawardenapura University Scholar Bank, Rajarata University Repository, South Eastern University e-repository, Research Repository at University of Jaffna) were searched. All published data available in these institutions for the required period were perused. In addition, unpublished data were obtained through personal communication with resource persons. All online databases were searched by two researchers independently and a third researcher checked all articles for relevance for inclusion.
4. REVIEW FRAMEWORK FOR ANALYSIS OF LOCAL DATA

The framework Diagram below (Figure 7) based on global evidence of best practice for IYCF shows the multiple factors that affect or influence the success of complementary feeding. The framework highlights the need for a strong policy, legislation and budgetary commitment at the base for creating an enabling environment, with all other factors presented contributing in some way to enabling environments. Coordinated multi-sector input where the Ministry of Health driven services are a part and other sectors must provide substantial input is indicated. In Sri Lanka, the issues that need to be resolved are with a minority of the population as reflected by the small proportion of infants who have poor nutrition indices and poor IYCF. Hence strategies must address the neediest, while maintaining adequate services to the general community as well. Growth monitoring and promotion of IYCF through BCC is the central method through which caregiver factors can be expected to be addressed effectively. Sri Lankan data is discussed in relation to this framework.
Figure 7: Local data were analysed based on the following framework
5. EVIDENCE ON IYCF FROM SRI LANKA

5.1 Available data on IYCF

Sri Lanka has the SLDHS survey data, Medical Research Institute (MRI)/United Nations International Children’s Education Fund (UNICEF) national surveys, the national food security surveys and the national IYCF surveys which provide nationally representative data. This data allows trend analysis in terms of prevalence of the main IYCF indicators. Other research studies in Sir Lanka are small and are hence not generalizable to the nation and do not provide strong quantitative evidence, however they do provide much data from a qualitative angle, even though the study designs are not specifically qualitative in nature. In addition, a few small scale programme evaluations have been documented.

Global and South Asian data indicate the importance of specific areas related to IYCF:

➢ Diversity
➢ Frequency
➢ Adequacy
➢ Responsive feeding and caregiver factors
➢ Context specific barriers (that affect each of the above factors).
➢ Process factors that relate to BCC and its delivery
  (intensive training of trainers and community mobilization).
5.2 The local background context

The comparison of SLDHS data (DCS, 2009; DCS, 2017) and National Food Security Assessment (NFSA) (Jayatissa and Hossaine, 2010) of all three nutrition indices of children under 5 years of age indicate that these statistics have remained stagnant, classifying under nutrition as a chronic issue in the country (Figure 8). During this same period, GDP has increased from 3,097 US Dollars in 2006 to 3,835 US Dollars in 2015, with an average economic growth rate of 6.2% per year since 2009. The national poverty head count ratio has decreased from 15.3% in 2006/7 to 6.7% in 2012/13 even though disparities remain (World Bank, 2017). The income disparity between the richest and the poorest segments of society has not changed significantly as shown by the GINI index which was 40.3 in 2006 and 39.2 in 2012 (World Bank, 2018). Hence the general economic improvement in the country appears not to be reflected in the nutrition indices. Therefore it is important to study those infants who are growth faltering to identify reasons why these pockets exist and what can be done to improve it.

It has been shown that a greater proportion of the income is spent on food among the poorest segment of the population in Sri Lanka. This leaves a smaller capacity to absorb financial stresses and a greater likelihood to result in a reduction in the quality and quantity of food consumed in poor households in times of financial crises (Atukorala et al, 2009). Although in the long term, investment should be towards improving household food availability and economic stability of the poor through multi-sector interventions, in the medium term the focus would be to improve household food choice and feeding practices within the available resources at household level. The transition induced changing food consumption
patterns indicate that there is a lack of understanding of the value of nutritious foods over more expensive processed foods and an influence of food advertising in determining food consumption patterns.

**Figure 8: Nutrition status of children under five (%), 2006-07, 2009 and 2016**

![Nutrition status of children under five](image)

**Source: DHS, 2006/07; NFSA, 2010; DHS, 2016**

The lack of a steady improvement in nutrition indices is a cause for concern, despite considerable investment in health and nutrition especially through policies and their implementation as a comprehensive network of Ministry of Health driven initiatives for the promotion of IYCF which have been in place for a few decades. The country has had a clear top down directive and commitment towards improving the nutrition indices of children aged under 5 years.
Broadly, the resistance to improvement in nutrition indices could be one of three reasons:

1. Interventions are not reaching the most vulnerable target groups.
2. The current interventions do not address specific issues of those who have poor indices.
3. A combination of the 2 factors mentioned above.

The first of these is easier to address through strengthening of the existing delivery framework. However, the second possibility requires greater in-depth study into the factors of those children who have poor indices. Current data do not address this issue directly as there are no longitudinal studies that have examined this vulnerable group to provide qualitative data. Hence this analysis is an attempt to look at all existing data that may point in the direction of an answer to issue number 2 and is presented in a concise manner to assist policy revision.

5.2.1 How do SLDHS prevalence trends compare with the national IYCF strategy objectives?

The national IYCF strategy objectives are annexed (Annexure 1). When comparing trends in SLDHS data for IYCF from 2006 to 2016 (DCS 2009, DCS 2017) alongside the national strategy objectives (Figure 9), the improvements observed in breastfeeding related parameters are on track. The long-term emphasis on breastfeeding both in early initiation and exclusive feeding, has led to greater improvements in breastfeeding than is seen in complementary feeding practices. The mean duration of breastfeeding is 30 months.
The reasons for this success were due to the culture of breastfeeding being already highly accepted in the society together with a collection of efforts:

- Breast Milk Substitutes code for promotion of breastfeeding and marketing of breast milk substitutes and proper complementary feeding.
- Baby friendly hospital initiative, as most births are now institutional.
- Knowledge and awareness of mothers’ due to clarity of the messages used.
- Training that health workers received which included a very clear identification of the problems and how to solve them.

The SLDHS data for complementary feeding too are on track in comparison to the strategy objectives (Figure 9). However qualitative deficits are seen beyond prevalence data, which will be discussed in detail in this document.

Figure 9: Selected Objectives from the national strategy for IYCF (2015 - 2020) vs progress to-date

Prevalence (%)

Breast feeding
Exclusively Breast
Exclusively Breast
BF at 12 to 15
Breast Fed at 20 - 23 Solid, semisolid or
Minimum dietary
Minimum meal
Minimum
Iron-rich food or i

initiated within the
1st hour 80% - 95%
from 75.8% to >90%
Fed for 6 months
Fed for 4 - 8 months
months from 92.8%
months: from 83.9% soft foods, Infants 6-
diversity, children 6 frequency, children
acceptable diet, children
fortified food or fo
that is fortified in t
home, children 6-2
months of age from
67.8% to 9

79.9
76
82
93.9
91.3
94.3
84.3
88.9
85
89.4
84.4
75.8
78.6
74
89

Source: DCS 2009, DCS 2016
5.2.2 Special /Vulnerable populations and infants

Disparities between districts in nutrition status

A distinct disparity can be seen in the rates of stunting among different districts in Sri Lanka (Figure 10), However the high national figures for IYCF mask the poorly performing districts. The disparity in stunting and anaemia between districts requires district level analysis of factors affecting IYCF. Separate district level analysis exists for the districts of Vavuniya (Ministry of Health and UNICEF, 2010) and Trincomalee (Ministry of Health and UNICEF, 2010), but not for all districts that are doing badly. Even in these analyses, a direct link is not made between poor indices and poor practices; therefore, it is not clear if the same infants who are undernourished are being poorly fed. Further, during programme delivery, district level targeting and monitoring is required (Jayatissa et al, 2012).
**Figure 10:** Prevalence of stunting in children aged 6 – 59 months of age by district

<table>
<thead>
<tr>
<th>District</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kalutara</td>
<td>6.8</td>
</tr>
<tr>
<td>Colombo</td>
<td>8</td>
</tr>
<tr>
<td>Gampaha</td>
<td>9.4</td>
</tr>
<tr>
<td>Hambanthota</td>
<td>9.5</td>
</tr>
<tr>
<td>Jaffna</td>
<td>10.1</td>
</tr>
<tr>
<td>Anuradhapura</td>
<td>10.4</td>
</tr>
<tr>
<td>Puttalam</td>
<td>11.3</td>
</tr>
<tr>
<td>Kegalle</td>
<td>12.5</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>13.1</td>
</tr>
<tr>
<td>Galle</td>
<td>13.6</td>
</tr>
<tr>
<td>Matara</td>
<td>13.6</td>
</tr>
<tr>
<td>Ratnapura</td>
<td>13.8</td>
</tr>
<tr>
<td>Monaragala</td>
<td>14.2</td>
</tr>
<tr>
<td>Kurunegala</td>
<td>14.5</td>
</tr>
<tr>
<td>Batticaloe</td>
<td>14.5</td>
</tr>
<tr>
<td>Polonnaruwa</td>
<td>14.8</td>
</tr>
<tr>
<td>Matale</td>
<td>14.9</td>
</tr>
<tr>
<td>Kandy</td>
<td>15.7</td>
</tr>
<tr>
<td>Mannar</td>
<td>17.4</td>
</tr>
<tr>
<td>Mullaitive</td>
<td>17.6</td>
</tr>
<tr>
<td>Killinochchi</td>
<td>18.1</td>
</tr>
<tr>
<td>Trincomalee</td>
<td>18.8</td>
</tr>
<tr>
<td>Ampara</td>
<td>19.3</td>
</tr>
<tr>
<td>Vavuniya</td>
<td>19.9</td>
</tr>
<tr>
<td>Badulla</td>
<td>22.3</td>
</tr>
<tr>
<td>Nuwaraeliya</td>
<td>23.8</td>
</tr>
</tbody>
</table>

Source: Jayatissa et al., 2012

### Disparity in anaemia and micronutrient status between districts

Both the 2012 and 2014 National Nutrition and Micronutrient Surveys (Jayatissa et al., 2012, 2014) showed a disparity, in iron deficiency, iron deficiency anaemia (Figure 11), zinc and calcium deficiencies between districts. Non-consumption of items from the food groups grains/roots/tubers, dairy products and meat/fish/organ meats on the preceding day showing an association with a higher prevalence of anaemia. The overall reduction in prevalence of anaemia over the years and the fact that iron deficiency is not the only associated factor, the need for further analysis of causes of anaemia, and the place for fortification rather than supplementation has to be considered (Jayatissa et al., 2014). Further

analysis of factors affecting food consumption was also suggested (Jaytissa et al, 2014).

**Figure 11: Prevalence of mild and moderate anaemia in each district**

![Graph showing prevalence of anaemia](image)

*Source: Jayatissa et al, 2014*

**Estate sector**

Estates have repeatedly shown poor indices as well as difficulties with providing care. It has been documented that cash transfers in the estate sector are poorly utilized (World Bank, 2012) and ways in which this can be improved has not been investigated. The multi-sectoral nutrition assessment in Sri Lanka’s estate sector (World Bank Group, 2017) showed that although breastfeeding was good, all 4 indicators of complementary feeding was less than 50% and cultural factors strongly influenced inappropriate feeding practices such as not giving eggs though affordable. Lack of affordability and access to food was also a factor. Contaminated water was highly prevalent in the areas studied. Basic antenatal care was received by a smaller percentage than national figures, and 28% did not

receive adequate Thriposha supplements. Only 28% of those who had poor weight gain were given adequate advice on how to tackle the problem, with gaps in supplement delivery as well. The nutrition specific and nutrition-sensitive programmes implemented by the Ministries of Health, Education, Economic development, Agriculture and livestock were also faced with uneven targeting and coverage issues. Thus essential interventions do not reach all in these areas. Lack of access to the potential beneficiaries as they work outside estates, and lack of private spaces to discuss sensitive issues is also a problem. Better quality communication aids are required for less literate populations. Inadequate monitoring and lack of coordination lies at the root of these issues. (Word Bank Group, 2017)

Innovative approaches may be needed to address issues in difficult areas as demonstrated by a case study in the tea estates. Weerasinghe et al, (2016) studied the use of messages sent through mobile telephones through a m-health platform in the estate sector and found promise in its use to strengthen existing face to face field level care and may help to reduce the burden on the health care worker in these difficult areas.

**Northern Province**

In the Northern Province survey, Jayatissa et al, (2012) documented that among the population studied 22.8 % were stunted, 18.3 % were wasted and 29.5 % were underweight. When compared with the nutrition assessment done in 2010, the survey in 2012 showed an increase in prevalence of stunting, wasting and underweight. An increase in prevalence of global acute malnutrition was seen with an improvement in severe acute malnutrition and an increase in moderate
acutely malnourished emphasising the need for sustained targeted care in these areas. In 2012 in the Northern Province one third of the population studied had received humanitarian assistance as general food distribution (18%), Samurdhi food ration (26%) and supplementary feeding (38%). Majority received Thriposha or corn soy blend and a small proportion received plumpy nut and BP 100. The Northern Province survey concluded that a review of programmes for the long-term prevention and treatment of acute malnutrition was timely (Jayatissa et al., 2012).

The study of complementary feeding practices among infants over 6 months identified that majority of children received solid semi solid or soft food with high consumption of pulses, milk and milk products, dark green vegetables and sugary foods and low consumption of meat products (Jayatissa et al., 2012). Jeyakumaran (2011) documented complementary feeding practices, identifying many aspects of care that can be improved with better targeted BCC in the Sandilipay Medical Officer of Health (MOH) area in the Northern Province.

The Northern survey conducted on behalf of the World Bank in 2012 (personal communication, 2012) also indicated that immediate attention was required to correct acute malnutrition and that community based intensive interventions were required to improve complementary feeding practices with a better understanding of how the grass roots level care workers function. It was observed that the non health interventions such as safe water and hygiene interventions that had begun needed to be continued. Both the world bank study and the Northern Province survey indicates that in these areas it is also important to focus on solutions to other background pressing issues that impact on family
food security such as generating livelihood and income opportunities. The need for identifying vulnerable households and long-term follow-up was identified by both surveys. More recently, Kandeepan et al, (2016) documented that food insecurity was associated with nutrition status among those born in Jaffna, and that disparity in nutrition indices exist between different areas of the Northern Province.

**Vulnerable infants**

The above data shows that there are infants with poor nutrition status scattered in all areas with a few areas having a higher prevalence. It is also important that even in the areas that document better statistics there are individual infants who have poor nutrition status. Often these infants are from the lower wealth quartiles, but there are fewer numbers of infants even from the higher wealth quartiles in most areas (DCS, 2017). There is inadequate data which study these infants who have poor indices in relation to complementary feeding practices. A recent study done by de Silva et al, (2015) observed differences in feeding practices between infants who had growth faltering and those who did not from child welfare clinics. Feeding practices were less than adequate in those who faltered compared to those who grew well. This study identifies the link between growth faltering and poor breastfeeding and complementary feeding. It was observed that inadequate quality, quantity and consistency of complementary food had a statistically significant impact on infant growth.
5.3 Policy and leadership

“Enabling policy environments for nutrition require evidence to support best practice and engagement with political and policy contexts, as well as leadership, resourcing, advocacy, and technical support. However, research on nutrition policy contexts is limited” Menon and Thow (2017). They studied the policy landscape and political dynamics in the Asian region and analyzed policy content and stakeholder influence on IYCF in many countries including Sri Lanka. Sri Lanka has a strong leadership and policy environment for IYCF compared to the region. The national nutrition policy includes IYCF and there is a comprehensive strategy document for Sri Lanka. Godakandage et al, (2017) studied IYCF related policies and programmes and concluded that all evidence-based recommendations were covered through the related policies with the Government Health Sector playing the main role followed by development partners. Education, agriculture, labour, social and economic development sectors are represented at policy level with regard to IYCF related activities.

5.4 Legislative support for the promotion of breastfeeding and correct complementary feeding

The legislative support that the promotion of breastfeeding and marketing of breast milk substitutes and commercial complementary foods received through the Breast Milk Substitutes Code was a key factor in the success of breastfeeding in Sri Lanka. Although marketing of complementary foods up to one year is covered under the same code, the same degree of strong legislative support is required for foods that are marketed to children beyond one year, in order to ensure correct complementary feeding. Disparities have been observed between
different policy documents that address maternity leave in different sectors. Mothers who are in atypical forms of dependent work are not covered by Sri Lankan maternity benefits recommendations and the Multi-sector Action Plan identifies the need for review and streamlining (Godakandage et al., 2017).

5.5 Muti-sector input and funding for IYCF activities

Uddin et al., (2017) document is an involvement of over 36 stakeholders in improving IYCF in Sri Lanka, who provide both funding and technical support and consist of government and non-governmental organizations. Twenty four policies were identified that contained provisions in line with global recommendations for best-practice IYCF and show the involvement of multiple sectors including, education, agriculture, labour, social welfare and covering areas such as marketing of breast milk substitutes, strengthening health and non-health systems, maternity benefits, inter-sectoral collaboration, capacity building, health education and supplementation. However, it has been documented that there are lapses in targeting of social transfer schemes and that Samurdhi benefits do not entirely reach the poorest segment of the population (Jayatissa and Hossaine, 2010). Suggestions have also been to include stakeholder participation at all levels including poverty alleviation and more effort is needed in inter-sectoral cooperation to improve nutrition status of marginalized groups (de Silva et al., 2009). Although health sector activities are well coordinated, coordination between other sectors need strengthening (Jayatissa and Fernando, 2011). Allocation of funds through a separate budget line is likely to give greater flexibility and streamlining of activities in both the health and non-health sectors (Jayatissa and Fernando, 2011).
5.6 Multi-sector interventions: health and non-health

5.6.1 Non-health sector interventions

5.6.1.1 Access to appropriate food: food security and availability of quality foods

The 2010 National Nutrition and Food Security survey (Jayatissa and Hossain, 2010) identified that 0.5% of the households were “severely food insecure”, 11.8% were “moderately food insecure” and 87.6% were “food secure” according to the World Food Programme (WFP) food insecurity classification. Household food consumption patterns indicated that almost all households consumed cereals/roots/tubers, sugar and coconut. 78% consumed fish or meat with sector disparities in wealth and income. Consumption of eggs was 35%.

5.6.1.2 Mother's education and wealth

Danansuriya et al, (2013) reported that maternal IYCF knowledge was significantly associated with maternal educational level, and Senerath et al, (2012) reported that maternal educational levels and poverty were significant factors affecting complementary feeding practices. The Northern Province Survey (Jayatissa et al, 2010) documented that in the population studied in the Northern Province, stunting, wasting and underweight declined with increasing levels of education of the mother. Thus, mother’s education affects both nutrition indices as well as feeding practices.

5.6.1.3 WASH coverage in Sri Lanka

Lack of access to good quality water and sanitation is closely linked to poor nutrition status, working through recurrent infections in the young child.
However, poor WASH in relation to complementary feeding is poorly documented. Disparities between different geographic locations such as remote rural areas and estates are not reflected in the high national prevalence figures for water supply (84%) and sanitation (86%). Pockets of poor sanitation still exist such as the resettled areas where open defecation is practiced. An additional burden is placed on the service providers during natural disasters which have been more recurrent in the recent past since 2004. It is documented that flooding in 2012 contaminated more than 20,000 wells, creating a significant increased risk of water borne infection. There is poor documentation of poor hygiene practices such as environmental safety during disposal of faeces and menstrual hygiene. Although water supply to schools is high, hygiene practices such as washing hands with soap may not be practiced by all. Statistics of water supply also do not reveal the lack of a continuous supply in areas counted as having access. Further, bacterial and chemical contamination of water sources are undocumented concerns (UNICEF, 2015). Non-governmental organizations such as UNICEF work with the Ministry of Water Supply and Drainage, the National Water Supply and Drainage Board and the education services to improve national capacity development, focusing on low-coverage areas in an effort to provide equitable access, through improving quality and systems strengthening and WASH (UNICEF, 2015). Improving these facilities to a 100% is an essential requirement in addressing poor nutrition status in this age group.

5.6.1.4 Social Security programmes

Multiple interventions targeting poverty and nutrition in Sri Lanka work through the Samurdhi programme and other nutrition related activities are carried out

through the Ministries of Health and Women's affairs. They require a clear identification of sectors responsible for coordination and linking with IYCF and better monitoring and evaluation. The Samurdhi programme targets low income households and the key components are poverty elimination, food stamps, a credit programme and rehabilitation and development of community infrastructure. The relief programme of Samurdhi includes cash transfer, asocial security fund and nutrition for mothers and children and empowerment activities include livelihood creation, social development, housing, microfinance and rural infrastructure development. The food basket is given to eligible pregnant women on a monthly basis. However, better targeting is required as Samurdhi benefits do not reach the entire poorest segment of the population (Jayatissa and Hossaine, 2010).

Social transfer programmes when integrated into nutrition programmes have shown to be helpful in improving child nutrition. When these were targeted to women and women's empowerment in other low-middle income countries (LMIC) it was able to achieve better nutrition for the family. There is global evidence for improved nutrition following social transfer programmes which maybe in terms of cash transfer, food transfer or employment. The cash transfer when linked to health and nutrition programmes have direct nutrition benefit, an analysis in Mexico documenting a significant reduction in child stunting following the cash transfer. In Bangladesh cash transfer during difficult seasons helped reduce malnutrition among women. (UNICEF, 2014). However, in the estate sector in Sri Lanka, often the cash transfer given to the mother on her delivery is used by the father, hence does not have the desired effect on the nutrition of the
mother and child (World Bank, 2015) highlighting the need for better monitoring and evaluation.

5.6.1.5 Agriculture: linking with IYCF

Agricultural extension workers currently empower households to grow local produce. However, they are not adequately linked to other IYCF programmes to give it a nutrition focus. Data exists (Attygalla, 2011) to show that agricultural extension workers can be linked to effective child nutrition programmes at grass root level, and that this requires good coordination of the work of the MOH staff and the agricultural staff towards an identified common goal, in this case increasing access to a variety of foods to improve dietary diversity at household level. A method for monitoring and evaluation of this coordinated work is required.

5.6.1.6 Use of mass media to promote the importance of enabling environments for IYCF

The effectiveness of mass media as a support medium in the presence of multiple interventions has been demonstrated in Vietnam for improving exclusive breastfeeding (Naugle, 2016). Sri Lanka is currently exposed to much advertising and the influence of advertising on mothers’ purchases has been demonstrated regarding branded milk products (Gankanda, 2011). Therefore, in order to create enabling environments effectively, the mass media can also be utilized positively if clear messages are developed regarding the need for enabling environments for correct complementary feeding. This is a potential method to create a demand by the population for enabling environments in order to promote change.
5.6.2 Health sector interventions

5.6.2.1 Well baby clinics: immunization and growth monitoring

The Nutrition and Food Security Assessment in Sri Lanka (Jayatissa and Hossaine, 2010) identified that 95% of the population of children under 5 years of age had received care at the child welfare clinic (CWC) with no major sector disparity. Immunization coverage is high with more than 95% of all vaccinations of the extended immunization programme (EPI) being given. Coverage of growth monitoring is also high. However, the gap is that data generated at individual level needs to be better utilized. Currently, growth monitoring is carried out at the clinics or weighing posts, but the Child Health Development Record (CHDR) booklet is kept with mothers. Mothers are encouraged by the PHM to visit the clinic each month. It is however likely that the defaulters are those who need it the most. Raising the question as to whether this is the best protocol for a growth monitoring scheme. At the same time 92% of interviewed mothers at the food security assessment in 2010 had the CHDR with them, leaving 8% who did not.

The PHM is empowered to identify at risk infants and provide Thriposha, and provide education on complementary feeding. However much greater input is required to train the PHM for specialized complementary feeding care on an individual basis in response to growth data, and/or refer appropriately. There is an inadequate documentation of the adequacy of the empowerment of the PHM as a result of the existing training programme. Jayatissa and Fernando (2011) found inadequate knowledge in selected areas of growth monitoring and promotion and management of severe and moderate malnutrition among the PHM’s interviewed.

The child welfare clinics (well baby clinics) are also the delivery points for IYCF. There are no data directly showing the effectiveness of the function of these clinics however a few available studies indicate some inadequacies in the quality of care provided at child welfare clinics in relation to IYCF. De Silva et al., (2015) studied differences in feeding practices between infants who growth faltered and those who did not from child welfare clinics. Feeding practices were less than adequate in those who faltered, indirectly identifying that although these infants were followed up at these clinics, individualized care for those who falter was not adequately provided. Bandusena and Warnasuriya (2009) studying 424 infants from several Well Baby Clinics at the De Soysa Maternity Hospital, Castle Street Hospital for Women and Colombo South Teaching Hospital along with field clinics from the Dehiwela MOH area documented that only 52% practiced exclusive breastfeeding for 4 months and beyond. Since these hospitals drain a wide cross section of the community although the sample size was small, would give a fair reflection of practices, and they highlight that poorer practices were observed in the field clinics rather than in the hospital clinics.

5.6.2.2 Supplementation and Fortification

Supplementation of macronutrients, energy, iron and vitamin A, and fortification

The national programme includes mega dose vitamin A supplementation and iron and Thriposha supplementation for low birth weight (LBW) babies. The national micronutrient survey identified that anaemia was associated with not receiving vitamin A mega dose at the higher age groups and not receiving micronutrient supplements and de-worming facilities (Jayatissa et al., 2014) Micro Nutrient

Powders (MNP) can be integrated with IYCF programmes in order to realize the full potential of MNP interventions. Home fortification of complementary foods with multiple micronutrient powders as recommended by the WHO is also an important factor to consider when studying the lack of improvement in nutritional indices in this age group (Wickramasinghe, 2012).

The National Micronutrient Survey (Jayatissa et al, 2012) highlights the trends in anaemia showing a steady decline as well as a shift in the severity towards mild/moderate (Figure 12), with the 2014 survey showing even lower prevalence, indicating the effectiveness of anaemia prevention programmes, which has an emphasis on supplementation. As the population improves in overall micronutrient deficiency, fortification would be preferred to supplementation at population level.

**Figure 12**: Trends in the prevalence of anaemia in children age 5 - 59 months

![Graph showing trends in anaemia prevalence](image)

*Source: Jayatissa et al, 2012*
Supplementary foods

An intervention (n=83) control (n=69) study with a home prepared high energy complementary food was found to be effective in improving weight of the child over a period of 8 months (de Silva et al, 2007). While there is consensus that adequate energy is required for growth, delivery of such supplements under programme conditions is often the issue. Thriposha beneficiaries are selected at Maternal and Child Health level from CHDR monitoring as well as during pregnancy monitoring. A packet of Thriposha (weighing 750 grams) is given to each beneficiary once in two weeks, which they are free to take home. It is estimated that around 50% of the children receiving Thriposha share it with their families, compromising its benefit to the intended child (Jayatissa, 2005). It is expected that each MCH assesses the effectiveness of the programme through the monthly beneficiary return forms. However, there are major gaps in data collections and analysis of the Thriposha programme, and monitoring does not always inform improvements to the running. The programme faces difficulties in funding personnel and infrastructure, in order to maintain momentum through the years. Further, a supplementary food alone is not adequate to address the issues of under nutrition in 6 to 23-month-old infants. Although the current guidelines also caution against supplementary foods (high energy) in moderately malnourished children due to the possibility of providing too much energy than is needed thus precipitating overweight (WHO, 2017), it is important to note that Thriposha provides protein and micronutrients and is not very high in energy, providing 4 Kcal per 100 g (Jayatissa, 2005).
5.6.2.3 Promoting breastfeeding: knowledge and practices and the baby friendly hospital initiative

Many small studies show good breastfeeding indicators in the majority. However, from the point of view of this analysis it was considered important to document factors that affect negative practices even in a small number of infants, as these factors need to be documented for corrective action to be taken.

Several small studies described below indicate reasons for suboptimal breastfeeding practices observed in some infants. While adequate knowledge was linked to correct practices, major barriers to achieving correct technique were:

- Non-receipt of help by a health care worker,
- Non-supportive environment,
- A delay in initiation.

There is still a minority who list inadequate milk as a cause to stopping exclusive feeding, formula feeds are given to a minority before 6 months and some add sugar to the feeds before one year. Poor knowledge of specific practices were associated with the practice itself. Importantly mothers who stop breastfeeding between 4 and 6 months do so because of the lack of breastfeeding leave.
A study done in the de Soysa Maternity Hospital showed that most practices that assist breast feeding in post-natal wards are adhered to, which include: timely skin-to-skin contact, timely initiation of breast feeding, rooming-in, offering help at first occasion of breast feeding, not encouraging formula feeding or bottles or teats. In the few cases where incorrect technique was observed, it was associated with non-receipt of help by a health care worker, not having a chair by the side of the bed and a delay in initiation. This study documents that poor knowledge regarding the positioning of the baby was associated with the poor practice of positioning (Hettiarachchi, 2010).

It is expected that this knowledge is given to mothers at the antenatal clinics, and this indicates that there still are a small minority to whom this message is not accurately disseminated and that it leads to poor breastfeeding practices. It is unclear from this study whether this resulted in long term breast feeding failure that would result in poor growth (Hettiarachchi, 2010; Hettiarachchi and Gunawardena, 2016). Providing a chair near the bed has also been suggested by others to improve initiation of correct breastfeeding practices following delivery (Fernando et al, 2016).
Others have documented that although breastfeeding rates are high, mothers expressed a concern for inadequacy of milk and growth faltering as the most significant reason for stopping exclusive breastfeeding between 2 and 4 months, and those who stopped between 4 and 6 months stated resuming employment as the most significant reason to stop exclusive breastfeeding. This is a repeating observation and needs to be addressed at policy level. It has been also shown that the non-formal sector and private sector employees are not provided with 6 months of maternity leave in order to exclusively breastfeed their children. This study was a follow-up study where the initial recruitment was of n= 500 from a cohort of 2215 babies born in Gampaha district (Perera et al, 2012).

There appears to be pockets of poor compliance with exclusive breastfeeding guidelines indicated by two small studies. Two hundred and nineteen infants in Beruwala were studied with a documented 62% being fed by a bottle (Agampodi et al, 2007) and Perera et al (2011) in the Ragama district reported that 61 children were started on formula before the age of 6 months and 144 of the total population of 500 had sugar added to formula within the first year of life.
5.6.2.3.1 Antenatal and postnatal care

The importance of the antenatal care period in imparting knowledge of breastfeeding is documented. A few small studies, document that majority of mothers received information during the antenatal care period. Although statistically powered information does not exist to show links between antenatal care and good practices, mothers' reasons for problems with breastfeeding have been documented as reduced antenatal health education. Further, although coverage of antenatal care and related education is high in percentage terms, it is important to note the misconceptions of the minority, as in order to improve the statistics further, the issues of the minority have to be addressed.

Out of 288 babies attending selected lactations centers within the Colombo district, 57% had difficulties in breastfeeding as documented through and observation check list. The documented reasons were: not having antenatal health education after admission, pain and discomfort during breastfeeding, not having previous experience and being discharged in 24 hours post-delivery (Fernando and Prathapan, 2017).

Mothers (n = 189) from 2 teaching hospitals in Anuradhapura and Peradeniya received adequate lactation management training through lectures (88%) and live demonstrations (75%). Mothers preferred the latter. Some myths still prevailed such as working mothers should start formula (26%), formula feeds enhance healthy growth (16%), formula feeds should begin at 5 months and that feeding should be to a time schedule (45%). (Tennekone et al, 2017).
5.6.2.4. Challenges regarding on-demand breast feeding after 6 months and after 12 months

Perera et al. (2011) makes the important documentation that breastfeeding is done in older children too frequently during the day as well as overnight. They studied 500 infants of whom 72% were breastfed beyond the age of 2 years. 30.6% of them were breastfed only at night while the others were breastfed on demand throughout the day. Overall, 82.6% of infants over the age of 2 years were fed overnight: 65 were on infant formula, 200 on breast milk and 73 on both (Perera et al, 2011). A very small study of 60 mothers documented that for most mothers, sharing the bed with their children results in nighttime breastfeeding at a rate of 4.8 times in infants between 5 months and one year and declined gradually over the next 3 years (Van den Berg and Ball, 2008). This could be expected to impact on complementary feeding. It is important that the child is not pacified with the breast and that “on-demand” feeding is correctly interpreted by the mother. However, there is no data studying the effect of “on-demand” feeding and its effect on complementary feeding of 6 – 23-month-old infants or differences between infants breastfed correctly and incorrectly in relation to complementary feeding.
“Mother-child interaction for developmental stimulation and emotional satisfaction needs to happen separately and in addition to the breastfeeding times”, ensuring that the child does not associate love and affection only/mainly with breastfeeding. Beyond 6 months, breast feeding cues should be hunger/satiety driven and in addition to correct complementary feeding schedules, where breast feeds are given following a complementary feed as “top-up”. Age appropriate stimulation for developmental goals need to be incorporated into education on IYCF so that mothers know how to adequately stimulate and provide love and care to their child in a way that it is not confused with infant feeding. This will ensure that mothers understand their infants better and develop a greater responsiveness to their infants needs as a whole including the child’s breast feeding and complementary feeding requirements. The futile nature of excessive breastfeeding beyond 6 months and its potential to reduce appetite for complementary feeds should be correctly explained to mothers.
5.6.2.5. Improving complementary feeding

5.6.2.5.1 Improving complementary feeding to improve nutrition indices

Feeding practices with regard to adequacy of complementary feeding has been shown to be a determinant of nutrition status (Sri Lanka Business Development Center for World Bank, 2012). An increasing trend in prevalence of stunting and wasting is seen as the complementary feeding time point advances from 6-23 months (Figure 13). Yet the overall national IYCF indicators are good. Then, how great a coverage in correct complementary feeding practices is needed to improve nutrition indices? The argument for achieving maximum possible levels in good IYCF practices which are irrespective of income and wealth, is manifold: it is likely that the small percentage of infants who do not have good practices are those that are at risk of poor nutrition indices, and if we do not address this we cannot change the statistics regarding nutrition indicators. Also, the benefits of a diverse good quality complementary feed on a regular basis would ensure not only prevention of under nutrition but also the prevention of over nutrition. Good feeding practices would lead to better food related social and emotional development and better control over their own hunger and satiety cues later in life.
In addition to the nationally representative surveys there are numerous published
and unpublished small studies that show inadequate diversity. Determinants of
reduced diversity that have been implicated are mother’s nutrition, wealth and
education, pointing towards buying power as well as empowerment in making the
correct choices. Quantity in terms of frequency of feeds as well as thickness are
other significant issues. Inadequate frequency and consistency on the other can be
expected to be linked to knowledge and skills although these have not been
specifically demonstrated, except through the few programme level intervention
studies that achieved an improvement following mothers’ empowerment. The
study of the specific factors that negatively affect the indicators of complementary
feeding is required.
5.6.2.5.2. Knowledge regarding complementary feeding

Many small studies have assessed the knowledge component of complementary feeding and a general improvement in knowledge over the years is apparent, with the CHDR document quoted as a source of knowledge. Danansuriya et al, (2013) documented that from among 295 mothers included, 61% had completely read the section on IYCF given in the CHDR. Further, they document the odds of having satisfactory IYCF practices as assessed by a 24-hour recall among mothers who read the IYCF section completely as being 2.4 times greater than those who had read the IYCF instructions partially or had never read them (Danansuriya et al, 2013). Solomon documented a lower percentage (43.3%) of mothers using the CHDR with 55.6% relying on the PHM for knowledge, in the Trincomalee area (Solomon, 2007).

A recent study on 383 mothers with babies 4-12 months old from Bibile recruited from a base hospital indicates that knowledge on complementary feeding is now reaching a wider population, with many years following the introduction of the new IYCF guidelines. A high prevalence of correct knowledge was observed, with mothers stating either the CHDR as a source of information (62%) or the midwife (29%) (Seram and Punchihewa, 2017). In the Jaffna district the CHDR use was documented as over 80% (Jeyakumaran, 2017). Correct knowledge was in aspects such as when to initiate and introduce different foods, consistency, frequency, and responsive feeding with documented response rates varying between 70% and 90%. Inadequacies were noted in what to do with breast feeding once complementary feeding was started and during illness.

Gankanda et al, (2011) studied 187 mothers of children who were between 1 and 5 years of age in the Pitakotte MOH area regarding milk and milk powder use. TV

Advertisements were a source of information in 36.5% with brand name being a significant factor in selection. The mean age of initiating cow's milk was 13.5 months with a SD of 9.2. Majority did not reconstitute correctly and a quarter used a bottle to feed and 58.3% gave more than recommended. Nithya Susangi and Adikari (2017) showed that education leaflets on IYCF improved knowledge.

Inadequate complementary food

Data from the National Micronutrient survey (Jayatissa et al, 2014) and many other individual studies have indicated that consumption of foods from the food groups, flesh foods, dairy and fruit and vegetables, were low and diversity was low, with cereal based foods being high. These figures are in line with the global comparison discussed above. Among infants, consumption of iron rich foods is lower than consumption of vitamin A rich foods at each age group (Figure 14) and the percentage of children with a minimum acceptable diet, reflecting both frequency and diversity was lower than 40% in each age group (Figure 15).
**Figure 14:** Percentage of children consuming foods rich in vitamin A and iron by age group (months)

<table>
<thead>
<tr>
<th>Age Group (months)</th>
<th>Percentage who consumed foods rich in vitamin A in last 24 hours</th>
<th>Percentage who consumed foods rich in iron in last 24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 - 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 - 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 - 59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: DCS 2017

**Figure 15:** Percentage of children with a minimum acceptable diet, including Minimum Meal Frequency and Minimum Dietary Diversity by age group (months)

<table>
<thead>
<tr>
<th>Age Group (months)</th>
<th>Minimum Meal Frequency: Breast fed (%)</th>
<th>Minimum Meal Frequency: non breast fed (%)</th>
<th>Minimum Dietary Diversity: ≥ 4 groups (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 - 11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 - 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 - 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 - 23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Jayatissa 2009

It is important to know the relative contribution of food availability to other factors that determine feeding. Data for a link between household dietary diversity and infant diet is not available. In the SLDHS data, dietary diversity of the mother...
consumption by women in the preceding 24 hours as follows: 58% legumes, 56% flesh foods and 13% dairy in the lowest wealth quintile vs the highest quintile having 76% legumes, 74% flesh foods and 35% dairy, pointing to food availability (DCS, 2017). This relationship can be expected to translate to the diet of the infant. There is some district variation observed, with very low dairy consumption among women in Moneragala.

While wealth index has been shown to be a determinant of inadequate complementary feeding practices. There are other determinants of inadequate complementary feeding such as lower maternal education, shorter maternal height, lack of postnatal visits, unsatisfactory exposure to media and acute respiratory infections identified through secondary analysis of SLDHS data (DCS 2017). They concluded that although the complementary feeding indicators were acceptable in a majority there are subgroups of inappropriate feeding especially in the 6 – 11 month age group (Senerath et al, 2012). Very low consumption of eggs, dairy and meat consumption has been documented in small studies (Solomon, 2007; Nandasena, 2006). Improving food availability requires multi-sector interventions. However, lack of correct information as well as exposure to incorrect information are modifiable through education and empowerment of the caregiver and community and such modifiable factors that determine inadequate complementary feeding need to be studied further.

Research gaps: To what extend can dietary diversity be achieved without a significant drain on the household income, is an unaddressed question
5.6.2.5.3. Addressing inappropriate feeding practices

Herath and Joseph (2016) document the consumption of high salt and sugar foods by young children aged under 5 years, but do not indicate specifically for the children group aged 6-11 months. Adding sugar was documented in infants 9 months old, in Panadura (Nandasena, 2006). Unsatisfactory feeding practices among the children group aged 6-12 months included unhealthy snacks in the Galle district (Langley-Evans, 2014). These observations together with the SLDHS finding that unsatisfactory exposure to the media is a determinant of poor complementary feeding brings a new dimension to inappropriate feeding practices (Senerath et al, 2012). Money is spent on the wrong types of foods which indicate that low food availability is not only dependent on wealth, but also depends on the knowledge required to make the correct food choice. Hence a much greater emphasis is needed on developing clear messages to assist correct food choices.

5.6.2.5.4. Responsive feeding practices

The principle of responsive feeding is to achieve responsiveness to the infant’s physiological needs of hunger and satiety and interest in food, while being quick enough to satisfy the infant before the infant becomes over-hungry and irritable and resorts to a demanding nature. Responsive feeding has not been captured through the national surveys but are shown in small studies which indicate a similar message. Most follow correct practices and said that they persuade the child to eat by telling lovingly and kindly and that they offer a variety of foods with different tastes (Figure 16).
It is important to note that a small percentage of individuals do not follow this method. Notable negative behaviours were:

- Feeding while walking around
- Feeding while showing birds trees and sounds
- Games related to meals- It is difficult to estimate the degree of distraction as opposed to being focused on food in these situations

The more extreme reasons were scolding, frightening, use physical restraint or offering a bribe. These are important caregiver behaviours which are likely to have a lasting negative impact on feeding behavior.

The studies that looked at responsive behavior documented the following hunger cues (Figure 17), majority said crying was a cue that the child is hungry and needs to be fed, asking for food and saying hungry or pointing to food was

observed in older infants, some mothers fed at a regular time of the day as they assumed the child was hungry, a few mothers waited until they displayed irritable behavior (Jeyakumaran 2012, Jayawickerma, 2006, Jeyakumaran, 2017).

**Figure 17:** Common hunger cues identified by the caregiver, of children aged 6 – 12 months and 12 – 23 months

![Bar chart showing hunger cues]

Source: Jayaratne, 2013, Jayawickrama, 2006

The cultural aspects that limit feeding of a young child as well as improper feeding methods due to lack of empowerment and skills are clearly observable in these studies. Interpreting these findings from a qualitative angle, they yield important information for future programmes. These findings indicate that in a small number of households negative feeding behavior exists which indicate a poor understanding of how to be responsive to an infant’s needs. Unfortunately, there is no data on the nutrition indices of these affected infants. However, it is important that these same factors are repeatedly observed in many different
study settings. Hence, they are significant enough to address during future behavior change intervention programmes. Simple messages need to be developed that directly address these issues.

5.6.2.5.5. Improving responsive feeding

Bently et al, (2011) reviewed studies of responsive feeding in low and middle-income countries and state that there are many interpretations of this method of feeding. However, they show that many studies document improvements in feeding response of the child following responsive behavior of the caregiver. There are many limitations to this type of study due to the differences in interpretation and definitions, albeit within the observation of its general benefits to complementary feeding and the observation that it is an integral part of good complementary feeding practices.

Jayawickema (2006) demonstrated an improvement of responsive care practices through a comprehensive intervention which resulted in significant improvement in nutrition indices in the intervention group compared to the control group. This highlights two important factors: firstly that feeding care practices are determinants of poor nutrition indices in the absence of a change in buying power, and secondly that adequate training of the usual health care worker through the existing system can effectively change complementary feeding practices including responsive feeding in mothers to levels adequate to make a change in the babies nutrition indices, the desired outcome. Rajapakse et al, (2015) demonstrated that such programmes with community mobilization can be done with no added cost to the system, as voluntary groups can bare the minimal

running costs. If implemented on a national scale a cost of initial preparation of material etc is expected, but this cost is likely to outweigh the gains in improved feeding practices. Further, as demonstrated by Rajapakse et al, (2015) the Hambantota programme which has now been running for close to 10 years, improved nutrition indices can be achieved. Both Jayawickrema (2006) and Rajapakse et al, (2015) examined a monitoring process with supervision of the health care workers who are in direct contact with mothers in order to maintain records of expected work carried out.

In making use of these findings, potential factors to consider would be:

- The extra burden to health care workers who are already burdened with routine duties needs to be adequately addressed if a sustainable programme is to be put in place.
- Waning of initial enthusiasm has to be factored in and weighed against the increased importance of the PHM within the community.
- Recognition of exemplary efforts of the health care worker through awards etc can be implemented nationwide.
- Translation findings to urban areas with more mixed social strata
- Reduced out-of-pocket health care spending may be used as a motivational factor

5.6.2.5.6. Challenges in responsive feeding

These findings show that commonly caregivers other than the mother feed the child. There is currently no mechanism for the caregiver to be adequately empowered. Factors particularly associated with the non-mother caregiver have not been studied and cultural taboos are more likely to creep in. The Hambantota study included fathers and grandmothers into the training sessions.

Training of the health care worker/dedicated workers/ within the context of their current workload requires that the health care workers need to be shown a reason to be motivated. They need to have ownership of their programme and be given greater social recognition, or see the programme itself as a way to improve their recognition in society. Rajapaske et al, (2015) documents that care givers felt positively motivated due to increased recognition. Successful projects need to be highlighted and used as a “model” to work towards. These general concerns can be addressed through studying successfully implemented IYCF programmes which use BCC methods (Annexure 2).

Many small studies document that lack of maternity leave between 4-6 months limits exclusive breastfeeding and promotes inappropriate complementary feeding.
Lack of leave beyond 6 months limits the mothers ability to initiate complementary feeding at the correct time as well as provide adequate attention to food preparation and responsive feeding and should be addressed through policy and legislation.

Involving the father in feeding and related decision making including where and what the child eats

Addressing care giver issues:

Caregivers other than the mother need to be trained as often the mother will not be there at feeding times.

Crèche staff need to be empowered in appropriate responsive feeding/self-feeding skills for the child

Poor feeding practices and nutrition indices are often linked to indicators of wealth. However, these limited intervention studies cast a doubt as to how important wealth is in translating into buying power. Especially as it appears that empowerment in these instances led to better utilization of existing resources. Including home gardening in addition would improve resources with minimal cost.
Research gaps: It is essential to study stunted and underweight children separately from normally growing children in order to assess specific care practices that are likely to be present and/or different in the 2 groups, to better target and develop community programmes which include both undernourished and nourished infants.

5.6.2.5.7. Cultural practices and feeding during illness

It has been documented that initiation of complementary feeding can be delayed up to 8 months due to the timing of the “indul kata game” ceremony (UNICEF, 2009) and Perera et al (2011) documents 4.4% of the population of 500 infants in Ragama having delayed introduction of complementary feeding up to 8 months, with the reason not documented. In a hospital based study of 300 mothers 25% believed that offering rice at night is bad. Giving water in addition to breast milk is a cultural practice and some follow it despite knowing the definition of exclusive Breastfeeding practice (Pathirathna, 2014). Many studies report that respondents believe that meal frequency should be reduced during illness (Danansuriya et al, 2013). In designing intervention documents these cultural practices need to be specifically addressed.
5.7 Behavior change communication (BCC)

5.7.1 Suggestions based on successful BCC programmes

Successful BCC programmes done in Sri Lanka and Asian countries were studied (Annexure 2: case studies) and the common features were identified and a list of suggestions for future programmes were compiled. The main factors that were important for scale up are monitoring and evaluation that are inbuilt within the system. It was observed in these programmes that monitoring can be achieved through the existing primary care system. The following are suggested:

- BCC Programmes need to be integrated into existing programmes. Hence the current PHM based setting is adequate.
- The human resource component must be strengthened. This can be done either by mobilizing the community through mother support groups or volunteers or well-wishers.
- Incentives for performance are required for the health workers and delegation of some duties to volunteers encouraged.
- Rigorous pre-training of the PHM and the support groups are required, which will need additional funding.
- Mobilization of other sectors in a coordinated way with the IYCF programme. Agriculture extension work and the administrative service which delivers the social transfer programme should be with nutrition as the focus. i.e. all programmes need to be aligned and targeted and linked to nutrition. As families need to be sensitized on how to utilize the additional support for child nutrition.

- Including additional caregivers such as grandmothers and fathers in the programme. Providing the service to crèches/daycare service providers. Include certification of daycare services in order to maintain standards.
- Methods for sustainability center around enthusiasm and motivation and therefore need to be results-driven. Regular growth monitoring results can be used for this purpose without additional cost.
- Technological support for data handling in monitoring and evaluation and in the use of growth monitoring data can be improved.

Jeyakumaran (2017), in a study on infants aged 6 – 12 months, in the Jaffna district Identified that a majority used IEC material as a source of information (Figure 18); of which the CHDR was the most commonly used (Figure 19).

**Figure 18: Use of IEC material**

![Figure 18: Use of IEC material](image)

*Source: Jeyakumaran (2017)*
5.7.2 Training of health care personnel and work load

Developing interpersonal communication skills of health care workers:

Periodic training programmes are held for all health care workers for IYCF through the MCH system. However due to the heavy work load of the PHM, it is not clear how effectively learning takes place and the degree of empowerment that is achieved of the trainer. Perera et al, (2015) assessed health promotion related knowledge among midwifes in one district and documented that only 40% correctly named actions in the area of ‘create supportive environment’. Actions to ‘develop personal skills’ were named correctly by 38.2% and 20.1% were able to correctly name an action in the area of ‘strengthen community

Source: Jeyakumaran (2017)
action’. These low figures are a concern regarding how empowered the grass roots level workers actually are. They also identified heavy workload among the PHM’s studied due to a high percentage of PHM’s doing additional long-term cover –up duties, which eats up into valuable time otherwise potentially spent on learning and delivery of care. Further, the effective health worker to family ratio would also be lower than the original allocation.

Senerath et al, (2012) examined the current health care service provision to pregnant mothers and documented that 66% had made at least seven antenatal clinic visits and 79% received antenatal home visits by the public health midwife. They also document that only 24% of post-natal mothers had received the recommended three or more home visits by the public health midwife and considering that this study also demonstrated the lack of postnatal visits as being a determinant of poor breastfeeding practices, it is a significant point to note. There is no evidence on the reasons why the PHM does not make the required antenatal and postnatal visits in all 100% of cases, where lack of incentives and motivation are likely to prevail.

There is inadequate evidence to suggest the adequacy of the quality of training received by the PHM. In 2006, Jayawickrema (2006) demonstrated that focused training of the health care provider together with a systematic programme with inbuilt monitoring of activities can achieve improvement in responsive feeding. The training for health care workers have been modified and improved over the years since this study and the secondary analysis of the DHS data were carried out. However, evidence from the small studies indicate lapses in the care provided, as well as in the empowerment of the mothers in both breastfeeding
and complementary feeding practices. The fact that the small study reported here could achieve effective change highlights that greater focused training can achieve better results.

There is inadequate information regarding the level of training of the PHM, or contact hours at child welfare clinics and its direct effect on complementary feeding. However, across the case studies of successful BCC programmes it is evident that BCC requires a well-trained health care worker. In identifying the infant who has the greatest need for targeted care, the PHM must be better trained to interpret growth monitoring outcomes and translate that into individualized feeding advice. Depending on the need of the infant this can be a task that is currently beyond the skill of the PHM, and if so correct referral must take place. Trainers need to have skills for providing cooking and feeding demonstrations and be provided with adequate material such as key messages and menus. The clarity of messages to be delivered is fundamental to effectiveness. The data discussed in this review indicates lapses in the clarity of messages that are now in the community, as demonstrated by pockets of improper practices on complementary feeding.

Attendance at child welfare clinics and growth monitoring rates are high. The evidence indicates that the gaps are possibly in the PHM’s understanding of how to carry out the task or in the clarity of the message.
5.7.3 Community mobilization: Caregiver/ Mothers support group

The importance of community mobilization for effective BCC is especially felt in complementary feeding as the PHM has a heavy workload and many caregivers are involved and influence infant feeding. Therefore, the whole relevant community needs to be empowered. Specific programmes to improve complementary feeding such as the Hambantota study, have documented effective caregiver support groups. Others have indicated difficulties in their function in health care (Thilekaratne et al, 2015).

5.8 Using routine growth monitoring to identify and intervene in the infant at-risk

Anuranga et al, (2012) studied the SLDHS surveys of 2000,2003,2006 and NFSS of 2009 for the determinants and factors affecting LBW in Sri Lanka. Food insecurity was found to mediate the association between LBW and poverty. While maternal height was a determinant, food insecurity was the major determinant and Thriposha supplements were not able to mitigate the effects of food insecurity. This is strong evidence to suggest that although targeted interventions exist, they do not adequately address pockets of reduced food access and needs to be addressed more directly. This highlights the need for identifying infants who have LBW and or demonstrate growth failure and targeting interventions which include improving food security as well as complementary feeding practices. Low birth weight groups would include infants who are small for gestational age as well as preterm infants with age appropriate weights. The PHM needs to be given clear messages regarding complementary feeding to address these groups and to refer appropriately. Further, the PHM also needs to ensure that these
families are effectively directed to other non-health sector interventions such as agricultural support, social transfer schemes and income generation schemes.

5.9 Monitoring and evaluation of programmes and research

Overall evidence shows that monitoring and evaluation as well as the critical use of this information to improve programmes requires the greatest degree of strengthening. Monitoring tools need to be designed to identify specific information of interest. Monitoring can help to demonstrate whether good child care is being practiced by those who had growth faltering. It is necessary to know whether nutrition indices improved in those same individuals who received improved care through longitudinal monitoring of vulnerable/ at risk infants. Supportive research needs to be undertaken to enable improvement in programmes. Further, new studies should also be designed to fill the gaps in knowledge identified by this review. Cross sectional data on prevalence of IYCF practices in the general population in small samples yield limited information.
6. CONCLUSIONS AND RECOMMENDATIONS

Global and regional comparisons rate Sri Lanka highly, not only in breastfeeding but also in complementary feeding. However, the stagnant nutrition indices in a proportion of infants requires targeting of care.

1. The existing service delivery systems can be used with specific fine tuning as suggested below. Infants who are growth faltering need to be identified by the health worker and either given specialized care regarding IYCF or should be referred. The PHM/health worker requires better training to enable her to identify and deliver this specialized care, and to refer.

2. BCC methods with inbuilt monitoring and evaluation can be incorporated into the existing delivery system following an assessment of the capacity for the PHM to provide this extra care to all. Incentives are required for motivation.

3. Research should focus on identifying IYCF and nutrition status in the most vulnerable infants who have poor nutrition indices: longitudinal studies assessing care practices of infants with growth faltering. Prevalence studies in perceived vulnerable populations such as the estates do not provide additional information to what is already known. Cross sectional studies of IYCF practices in small populations are no longer useful.
6.1 Main conclusions and recommendations from breastfeeding studies

- Streamlining maternity leave and benefits across all sectors to cover the six months exclusive breastfeeding period is essential. In order to improve breastfeeding practices further during the exclusive breastfeeding period and up to one year, the major barriers unavailability of maternity leave and benefits for employed mothers.

- The baby friendly initiative and lactation center activities are effective and can be strengthened where they may not be.

- The antenatal care period and the postnatal home visits by the PHM are a significant contributor to good knowledge and practices. Methods are required to ensure that all mothers receive all the antenatal and postnatal care in the current schedule.

- The negative factors regarding bottlefeeding and formula should be reiterated through the usual education during antenatal care.

- Mothers prefer demonstrations of correct feeding technique rather than lectures, which can be encouraged during antenatal care.

- A small minority of mothers do not bring the CHDR to the clinic for growth monitoring. It is essential to identify whether these children are also those who are growth faltering.
6.2 Main conclusions and recommendations from complementary feeding data

- The local small studies and the surveys indicate that diversity, frequency and adequacy is high in comparison to the region. Yet, it has not been sufficient to improve nutrition indices further.

- There is a proportion of infants who do not receive flesh foods, dairy, or fruit and vegetables adequately, some who receive foods of a thin consistency and some who receive inadequate number of meals per day.

- A poor understanding of breastfeeding on demand, resulting in feeding through the day and night which is likely to negatively impact on complementary feeding is also documented.

- Responsive feeding - Many small studies identify inadequacies in the community related to feeding technique. These behaviours impact eventually on what the child is fed as well as how the child responds to food. This negative behavior is likely to track into childhood and even adulthood. Since the factors that some mothers have difficulty with are related to control (too lenient or strict), these children will not be well adjusted to manage their own hunger and satiety cues and this would lead to both under nutrition and over nutrition. Therefore, in the wake of the double burden, a major emphasis needs to be placed on responsive feeding to ensure that mothers understand the education messages that are delivered accurately and are empowered with the skills of responsive feeding.
• Training of caregivers other than the mother including crèche staff, quality assurance for daycare institutions, including feeding care and involving the father in feeding related decision making are all important factors for effective responsive feeding.

• The CHDR as an education tool is effective. However not all mothers read it, and it is not clear why some mothers do not read it. It is likely that readership will increase if the CHDR can be improved as a more reader friendly document to impart knowledge on IYCF.

• Multisector coordinated input is required to improve economic and social factors that affect food buying capacity, and food availability and correct food choice within the existing household budget. Coordination must also work between the health and non-health sectors to enable identified infants to receive these benefits.

• Maternity benefits from employers are required beyond the 6th month of delivery to enable a smooth establishment of complementary feeding following the breastfeeding period and these benefits need to be streamlined across sectors.

Increasing dietary diversity is possible in the medium term through adequate education and behavior change communication. In the long term, increasing food availability through multi-sector support will ensure sustained improvement in diversity which is likely to address both under nutrition and over nutrition.
6.3 Behaviour change communication programmes

- Programmes need to be integrated into existing programmes. Hence the current delivery system within the health sector is a base.
- Strengthen of the human resource component – community mobilization.
- Performance based incentives to health workers
- Rigorous pre-training of the health worker and the support groups
- Establishing budget lines and multisector coordination
- Incorporating a nutrition focus into all supportive services from non-health sectors.
- Including all additional caregivers into the programme.
- Include certification of daycare services and maintain standards.
- Methods for sustainability and maintaining enthusiasm and motivation need to be results-driven. Regular growth monitoring can be used for this purpose without additional cost.
- Technological support for data handling.

6.4 The gap in literature

While we observe that the nutrition indices appear resistant to improvements despite the improvements that have been observed in IYCF practices, many important pointers are demonstrated by the small studies. The figures we observe are population figures which do not indicate which infants benefit from good IYCF or how they benefit from it. At the same time, national figures do not indicate how the stunted group of infants are fed. Even though diversity
frequency and adequacy may have improved in the population, we do not know if it has improved in the most vulnerable.

However, the small studies repeatedly indicate a few negative behaviours in a minority related to responsive feeding. The infants who are affected by these negative behaviours can be expected to have inadequate food intake and possibly nutrition indices. This link is not documented but evidence comes from the few successful intervention programmes that have been able to improve IYCF related care practices overall. Therefore, it would be safe to say, that even in the absence of a change in the household budget the complementary feeding indices do improve through responsive feeding and knowledge regarding the importance of diversity, frequency and thickness of feeds. Thus, if universally accepted intervention programmes are to be designed, it is important that care practices of undernourished infants are studied longitudinally.

There is inadequate data to determine the magnitude of the effect of lack of access to foods against poor food choice on poor nutrition indices. While the negative impact of media needs to be studied more fully, the potential use of media to promote correct practices must also be studied.

There is inadequate local data to suggest an optimum amount of fat that needs to be included for optimum growth especially in the infants who do not grow optimally.

The national strategy objectives for IYCF are annexed (Annexure 1). When considering the findings from this analysis of data in relation to the national strategy objectives for IYCF, objectives 1-5 are on track towards the 2020 target. Objective 6 has to be addressed. In order to reduce bottle feeding, maternity leave needs to be given to all segments of the population for up to 6 months.

Objectives 7-11 regarding complementary feeding can be addressed through the proposed mechanisms above. Objective 12 requires strengthening of the PHM’s duties, incorporating the use of individual growth data to inform feeding advice with periodic reevaluation. Objective 13 can be addressed through studying the undernourished child as well as the specific factors observed in the different sectors and districts and requires some formative research.

All available data between 2006-2017 on complementary feeding was included in this desk review as the intention was to identify reasons for poor IYCF and how it might be linked to poor nutrition indices. Since prevalence data were not used in itself to make conclusions, it was considered more relevant not to exclude any studies based on a standard quality check of data. The effects of interventions on improving growth were hence not assessed, but qualitative aspects of successful programmes were detailed. Given the need for qualitative data in order to understand the issues with IYCF, it was considered that the summary findings could reasonably be used to inform policy and strategy design.
Annexure 1: Sri Lanka Strategy Objectives for IYCF

Proposed objectives to be achieved by 2020

1. To increase the proportion of newborns in whom with breast feeding is initiated within 1 hour of life from 80% (2006-2007) to 95%
2. To increase the proportion of infants under six months of age who are exclusively breastfed from 75.8% (2006-2007) to ≥90%
3. To increase the proportion of infants 4-5 months of age who are exclusively breastfed from 53.5% (2006-2007) to ≥75%
4. To increase the proportion of children 12-15 months of age who are breastfed from 92.6% (2006-2007) to 95%
5. To increase the proportion of children 20-23 months of age who are breastfed from 83.9% (2006-2007) to 90%
6. To decrease the proportion of children 0-23 months of age who are fed with a bottle from 30% (2009) to 15%
7. To increase the proportion of infants 6-8 months of age who receive solid, semisolid or soft foods from 83.9 % (2006-2007) to 100%
8. To increase the proportion of children 6-23 months of age who receive foods from 4 or more food groups (minimum dietary diversity) from 71.1% (2006-2007) to 90%
9. To increase the proportion of children 6-23 months of age who receive the minimum meal frequency from 88.3% (2006-2007) to 90%
10. To increase the proportion of children 6-23 months of age who receive at least the minimum acceptable diet from 67.9% (2006-2007) to 80%

11. To increase the proportion of children 6-23 months of age who receive an iron-rich food or iron-fortified food or food that is fortified in the home from 67.8% (2006-2007) to 90%

12. To increase the proportion of children whose growth is monitored regularly according to the age: infants from 84.3% (2014 – H 509) to 90%, young children from 77.1% (2014 – H 509) to 85%

13. To reduce inter-district/inter-sector disparities of above indicators by bringing down higher rates to a range within 10% of the national average values
Annexure 2 - Selected Case Studies from Sri Lanka and the region

CASE STUDY 1: Programme for improving the practices of complementary feeding: experience from a community based programme in Hambanthota District (Rajapaksa et al, 2015).

The Hambanthota IYCF programme was developed in response to the fact that prior to 2008, the Hambantota District showed high levels in the prevalence of low weight for height and height for age among children under 5 years. Baseline data collected indicated poor knowledge of correct complementary feeding practices. This pointed to the possibility that the knowledge and counseling skills of the PHMs regarding complementary feeding may need updating. With this in mind, a programme was developed to improve complementary feeding practices of mothers/caregivers with infants who had completed five months of age.

The objectives of this programme were to improve the competencies of public-health midwives in infant and young child feeding and to improve the knowledge and skills of mothers in the area of infant and young child feeding (IYCF), at the time that their infants completed 5 months of age and also to empower and mobilise the community to support correct complementary feeding practices.

All programmes were held on the same day in all 77 centers in the Hambantota district according to a pre-set calendar with the aim of achieving more that 95% coverage of the target group. Further aims were to maintain uniformity of the content to be included in the programme across all areas and to ensure sustainability of the programme.

Prior to implementation of the programme, all field staff were trained and all the
support material such as display boards and booklets were developed for use in all centers. A guideline document was developed which detailed the protocol for carrying out the workshops for capacity building of mothers by the PHMS.

Contents of the workshop focused on 10 key messages relevant to complementary feeding and dissemination was supported by the display boards

- Exclusive breast feeding until completion of 6 months of age will facilitate optimal growth and development of infants.
- Starting of semi-solid foods, in addition to breast-milk, immediately after completion of 6 months while continuing to breastfeed for 2 years or longer.
- Introducing complementary foods in a thick enough form to stay in the spoon gives more energy and nutrients to the child, facilitating healthy growth.
- Introducing foods of animal origin (meat, fish dry fish etc.) very early (around one week after introducing complementary food), is essential for healthy growth and brain development of the infant.
- Legumes such as dhal, beans, chickpeas, green gram, nuts and seeds contain important nutrients needed for growth and should be introduced into the child’s daily diet gradually.
- Dark green leaves, as well as yellow fruits and vegetables, helps a child to have healthy eyes and fewer infections, and needs therefore to be introduced into the daily diet.
- More meals and variety of foods are needed as the child grows older.
- A young child needs an increasing quantity of foods and gradually change the consistency of foods.
- A growing child needs to learn how to eat, and therefore it is necessary to encourage and assist him with lots of patience (responsive feeding).
- Encourage the child to drink and eat more during an illness, and afterwards to help recover early and maintain normal growth.

These key aspects were further discussed through demonstrations with participation of mothers and community groups.

The responsibility for supervising the conduct of the workshops lay with the supervisory staff of the MOH and this was done by visiting the centers at the times of the workshops and any observations were discussed at MOH/district level.

**Monitoring of this programme was integrated into the routine programme of growth monitoring done by the PHM.**

**Effectiveness/impact of the programme was assessed through collating routinely collected data via the growth monitoring programme.**

Available data indicated a decline in the percentage of infants and preschoolers who were underweight, over the years from 2009 onwards and could be considered a successful attempt at improving complementary feeding practices in a predominantly rural population.

**Figure**: Percentage of infants and preschoolers who were underweight

![Graph showing percentage of underweight infants and preschoolers from 2007 to 2012](image)

*Source: Annual Reports on Family Health Sri Lanka, 2008–2009 and 2010, Family Health Bureau, Ministry of Health (based on data from H 509)*
Important lessons can be learnt from this programme for other districts. The interest and commitment of mothers through mothers’ clubs and volunteers and health staff ensured its continuation to-date.

**The use of a wide range of educational methods enhanced the ability to keep the interest of the mothers, and also encouraged their active participation.**

The content of the workshops included: preparation of food, demonstrating consistency of actual foods, examples of snacks, demonstrating feeding techniques including fathers and grandmothers (Rajapaksa et al, 2015).

- **Step 01:** Key messages were developed
- **Step 02:** Target groups were identified
- **Step 03:** Workshops were conducted, with help from mothers clubs and PHMs

- Booklets printed
- Food items displayed
- Food prepared

- Demonstrating increased quantities with age
- Demonstrating the consistency of food
- Demonstrating feeding
CASE STUDY 2: Infant and young child nutrition among a plantation community in tea estates in Sri Lanka (Attygalle, 2011)

The programme was conducted in the plantation sector in the areas, Hanguranketha, Kotmale, Nuwara Eliya, Walapane, and Ambagamuwa. At the outset of the programme the selection of households who would participate in the programme was undertaken through a nutritional profiling by all four extension staff officers; the PHM at MOH level, the Samurdhi officer (poverty alleviation program worker at village level), Agricultural extension and research worker at village level, Grama Niladhari (administrative worker at village level). The programme was mainly to strengthen the existing activities carried out through the Health Ministry addressing the first 1000 days concept which included pre-pregnant care, optimal care during pregnancy, care of the pregnant mother with inadequate weight gain, optimal growth through promoting IYCF within the first two years of life and close follow-up of LBW babies. Growth monitoring was coupled with multiple micronutrient supplement and capacity building on IYCF. Leaflets and the CHDR were used as education material.

The monitoring and evaluation protocol used is particularly important.

- The PHM maintained individual follow up records.
- The number of IYCF and other nutrition programmes done were entered with remarks.
- Indicators developed by different sectors
- Monthly reviews: at village level through the village committee.
- Monthly reviews: at the monthly conference, by the divisional secretary or MOH
- Reviews: at the district nutrition committee by the Grama Sevaka.
- Quarterly review at the provincial level
- A data base was maintained at the DS/MOH level to monitor nutrition progress.
At the end of six months, the greatest percentage improvements were observed in severe wasting, followed by wasting, underweight and stunting. As expected improvements in stunting would require longer term follow-up. The identified strengths were a strong political commitment, and involvement of the different sectors as well as the availability of a strong infrastructure for service delivery. These factors are applicable to most parts of the country now.

**The identified challenges such as multi-sectoral accountability and integration into the routine programme are factors that require a process to be identified and laid down before scale-up.**

**The negative counter influence of the media was also stated and is ever present as a deterrent to most BCC interventions and needs to be separately but parallely addressed.**

Community mobilization was an essential feature in this programme as well as all other programmes reviewed.
Of the six factors required for successful scale up, which include a comprehensive strategy including policy, health services, community based support, integration into existing programmes, BCC methods and monitoring and evaluation, the two factors that need more input for Sri Lanka were identified as strengthening community based support for IYCF at scale and a thorough BCC component.
The key findings from this report were:

- Breastfeeding improvement can occur within a short space of time, but needs continuous input for sustenance.
- Community personnel need constant encouragement and mentoring
- Multiple programme frameworks needed
- Effective communication from policy to household required
- Training focused on interpersonal counseling skills of trainers and community workers
- Improvements seen in small scale maybe difficult to achieve during scale up, and partnerships and resources are essential; it is the community and partners rather than the recipients that drive programmes
- If a comprehensive approach is used it can be feasible; many levels of partners, capacity building, BCC and an enabling environment created.
CASE STUDY 4: SIX COUNTRY CASE STUDY - IYCF programmes at scale (UNICEF, 2010)

This focused primarily on breastfeeding and included Sri Lanka as one country. However, the lessons learnt are applicable to complementary feeding as well.

Figure: Factors identified for scale up

If these lessons are to be applied to complementary feeding the difficulties with regulating the food environment is a significant barrier, given that most of the other identified requirements can be met.
The community factors such as:

- Training in counseling and problem-solving skills,
- Performance based training methods and
- Integrated training strategies are also required.
- Further, the presence of trusted community members is essential with a coherent, comprehensive, clear, communication strategy. (IYCF programme review UNICEF 2009)

Experience with Protection of Breastfeeding in SUN countries in Asia (SUN 2014 webinar), and in the 6 country UNICEF report on breastfeeding scale up, Sri Lanka is presented as a success story, which indeed it is, in relation to its neighbors. The major strength is identified as the community outreach achieved by the PHM, yet how do we go beyond, to achieve 100% coverage, is a little more challenging. Further when applying this framework to complementary feeding, we need to see how to strike a balance to achieve the same degree of effect through the already burdened PHM. It is likely that greater resources to strengthen this service would be required, with context specific community mobilization and building of partners.
CASE STUDY 5: A FOUR COUNTRY CASE STUDY-Bangladesh, Malawi, Peru and Zambia (Champeny et al, 2016).

Factors for success of the 4 case studies in the 4 countries include:

- Dietary diversity can be improved provided that constraints to access are addressed.
- Complementary feeding practices can be improved if existing platforms are used for interventions provided a few priority behaviours are targeted and the required intensity is achieved.
- Caregivers were willing to change even outside community norms if they were convenient and the child enjoyed the experience.
- Since effective programme design implementation and evaluation requires resources, a clear evidence based rationale is used to convince decision makers to invest.
- Effective strategies and tools are needed to enable other sectors to get involved such as agriculture.
- Good results are possible in diverse settings provided that there is a clear realistic plan, additional human resource, maintaining standards for quality and monitoring, consistency in the IYCF communication, time for counseling by health providers, and food advertising and agricultural input for an enabling environment.
CASE STUDY 6: Mother support groups for health and nutrition care (Thilekeratne et al, 2015).

Thilekeratne et al, (2015) document mother support groups established in Trincomalle Baticaloa, Vavuniya and Mulathivu. These groups have been formed with the motive of improving women’s role in nutrition care and to be mobilized and empowered. In this approach, 7-10 mothers are either elected by the community or selected by the PHM and other leaders and function to look after the interest of mothers and children especially aged under 5 years. These mother’s role is to assist with the same routine tasks as described under health volunteers. They are also assigned the tasks of mobilizing mothers to come to clinics, assist with compliance factors such as mothers ingesting supplements, drawing the attention of the PHM to vulnerable mothers and children amongst others. They may also be mobilized to help achieve specific indicator targets. Recognition however maybe a challenging factor in forming these groups. These groups have promise for IYCF programme implementation at community level as demonstrated through the Hambanthota project and help to empower women in general.
REFERENCES


Hettiarachchi C.A. (2010) Techniques of breast feeding and factors associated with it among postnatal mothers at De Soysa Maternity Hospital, Colombo. MSc in
Jayaratne S.S. (2013) Knowledge, attitudes and associated factors regarding responsive feeding among primary caregivers of children aged 6 to 12 months attending child welfare clinics in Homagama Medical Officer of Health area. MSc in Community Medicine. Thesis. Post Graduate Institute of Medicine, University of Colombo, Sri Lanka.


Kumar, N., Scott, S., Menon, P., Kannan, S., Cunningham, K., Tyagi, P., Wable, G., Raghunathan, K. and Quisumbing, A. (2017) Pathways from women's group-based programs to nutrition change in South Asia: A conceptual framework and


strengthening infant and young child feeding policies in South Asia: Insights from the SAIFRN policy analysis project. *BMC public health, 17*(2), p.404.


United Nations Children's Fund.(2009) Tracking, Progress on Child and Maternal Nutrition. Available at :


