

ASSESSMENT AND RESEARCH ON CHILD FEEDING (ARCH)

A PROJECT OF HELEN KELLER INTERNATIONAL

REPORT

Assessment of the Labels of Commercially-Produced Complementary Foods Sold in Cambodia, Nepal, Senegal and Tanzania

The ARCH Project was funded by the Bill & Melinda Gates Foundation.

EXECUTIVE SUMMARY

Recognizing the important role of nutrition during the first two years of life global guidance makes some broad recommendations as to the appropriate content of labels that appear on commercially-produced complementary foods (CPCF), marketed as suitable for feeding infants and young children up to the age of two years (See Box 1). At the request of the 67th World Health Assembly (WHA) in resolution 65.6, to provide clarification and guidance on the ‘inappropriate promotion of foods for infants and young children’, the WHO is currently consulting on such guidance, which will be presented to the 69th WHA in May 2016 (WHA 2012).

This cross-sectional study assessed the labels of CPCF sold in the most populous metropolitan areas of Cambodia (Phnom Penh) Nepal (Kathmandu Valley) Senegal (Dakar) and Tanzania (Dar es Salaam) to assess their support of optimal infant and young child feeding (IYCF) practices as recommended by current best practice global guidance from the World Health Organization (WHO, 2003), the Maternal, Infant and Young Child Nutrition Working Group of the 10 Year Strategy to Reduce Vitamin and Mineral Deficiencies (Quinn et al., 2010) and national legislation. It should be noted that this research was undertaken prior to the release of the WHO Scientific Technical Advisory Group discussion documents drafted in response to WHA 65.6 on the inappropriate promotion of foods for infants and young children, which were in fact partially informed by this research (WHO 2013, 2015).

The study found that many of the CPCF labels assessed did not fully comply with either the international guidance or national legislation. The results provide evidence of a need for more detailed normative guidance on certain labelling practices in order to protect and promote optimal IYCF.

The main findings of the study include:

- Text in the language required by national legislation was provided on 4% of labels in Phnom Penh, 100% in Kathmandu Valley, 88% in Dakar Department and 96% in Dar es Salaam (Nepal and Tanzania permit English-only labels in addition to labels in local languages).
- Almost half (49%) of all products from all 4 sites were imported from Europe and the United Kingdom, where legislation allows an age of introduction of less than 6 months, compared to the global guidance adopted by many developing countries where these products are exported to.
- Between 4-30% of product labels across the four cities did not provide any age recommendation and 9-20% of products recommended an age of introduction of less than 6 months.
- Few CPCF products provided a daily ration (0-9%) and 15-56% of those that did exceeded the daily energy recommendation for complementary foods for a breastfed child 6 to 8.9 months of age.
- Only 4-27% of labels provided accurate and complete messages in the required language encouraging exclusive breastfeeding and almost none (0-3%) provided accurate and complete messages regarding the appropriate introduction of complementary foods together with continued breastfeeding.

- Between 34-70% of CPCF manufacturers also produced breast-milk substitutes (BMS) and 42-78% of CPCF products cross-promoted (that is the use of one product to promote another) BMS products from the same company. Cross-promotion is defined as the use of one product to advertise another (Cambridge Dictionaries Online, 2014).
- A variety of claims, including nutrition claims (nutrient content claims and nutrient comparative claims), health claims (nutrient function claims/other function/implied health claims and reduction of disease risk claims) and other claims (non-nutrition/health claims), were identified on the labels of CPCF. With regards to nutrition claims, nutrient content claims were more common than nutrient comparative claims. Health claims were also prevalent. Of the four countries, CPCFs purchased in Nepal had the highest prevalence of both nutrient content claims (91%) and health claims (96%). Non-nutrition claims (for example allergens, additives and religious or quality certification) were most commonly found on labels in Senegal (92%).

Key messages:

- Current labeling practices of commercially-produced complementary foods (CPCF) sold in Phnom Penh, Cambodia; Kathmandu Valley, Nepal; Dakar Department, Senegal; and Dar es Salaam, Tanzania do not support global optimal infant and child feeding recommendations and many do not follow national legislative requirements.
- Specific and detailed global guidance on appropriate labeling of CPCF and the prevention of cross-promotion with breast-milk substitutes is necessary to ensure products promote optimal IYCF.
- Labeling regulations should be strengthened and enforced to prevent practices that undermine breastfeeding and optimal complementary feeding.
- Manufacturers of CPCF should ensure CPCF products are appropriately labeled to support global IYCF messages and comply with national law.

INTRODUCTION

Infant and young child feeding practices

There has been increasing global focus on optimal infant and young child feeding (IYCF) practices with the recognition of the first 1,000 days of life (from conception to two years of age) as a key window for improving health outcomes (Bhutta, et al., 2008; Black, et al., 2008; Bryce, et al., 2008; Victora, et al., 2008). Poor complementary feeding practices are a concern in many low and middle income countries where malnutrition is a public health concern. The State of the World's Children (2015) reported that 92% of Tanzanian, 88% of Cambodian, 67% of Senegalese and 66% of Nepali children are introduced to complementary foods at the age of 6-8 months (UNICEF, 2015). However some studies show that complementary foods or beverages other than breast milk are often given to children before the recommended age of six months (Kimani-Murage et al., 2011; Radwan, 2013), although the World Health Organization recommends exclusive breastfeeding up until the age of six months. For example, in Kathmandu Valley, Nepal and in Dakar, Senegal 24.7% and 13.3% of children under the age of six months respectively were fed complementary foods the previous day. In addition, once children started complementary foods at six months, 50.0% in Kathmandu Valley and 31.7% in Dakar Department meet the minimum standard with respect to adequate feeding frequency, minimum dietary diversity, and minimum acceptable diets (Pries et al, In press; Feeley et al, In press).

Commercially-produced complementary foods (CPCF) are considered to be an option for some mothers who can afford them and have the knowledge and facilities to prepare and feed them safely (WHO, 2003). High quality, safe, nutritionally adequate and affordable fortified complementary foods and nutrient supplements may be necessary in some populations, as part of a broader strategy to improve infant and young child nutrition, to meet the nutritional needs of older infants and young children (UNICEF, 2011a; WHO, 2003, PAHO 2003). Inappropriate marketing of CPCF could, however, undermine optimal breastfeeding practices (Lutter, 2003; Piwoz et al., 2003) by, for example, encouraging their early introduction or recommending an excessive daily ration that interferes with continued breastfeeding (Quinn et al., 2010).

Labeling guidance for CPCF

Food labels provide basic product information to the users on health, safety and nutrition, but they also serve as a vehicle for food marketing, promotion and advertising (CFIA, 2011). CPCF labels should perform both these functions adequately and appropriately in order to protect and promote optimal infant and young child feeding (IYCF). There is, however, a lack of comprehensive formal guidance from international normative bodies on the appropriate marketing of CPCF, including labeling practices.

The 'International Code of Marketing of Breast-milk Substitutes' (the Code) (WHO, 1981) offers little guidance in this regard, as CPCF do not fall within its scope unless marketed or otherwise represented as a partial or total replacement for breast milk.

Recognising the need for guidance, between 2007 and 2010, the Maternal, Infant and Young Child Nutrition Working Group (MIYCN WG) of the Ten Year Strategy to Reduce Vitamin and Mineral Deficiencies developed a working paper “Using the Code of Marketing of Breast-milk Substitutes to Guide the Marketing of Complementary Foods to Protect Optimal Infant Feeding Practices” (Quinn et al. 2010). This document provides guidance on how the marketing of CPCF (product labeling; advertising and promotion; marketing activities such as the sale, use and provision of information within the healthcare system) can be guided by the Code and subsequent relevant World Health Assembly (WHA) resolutions in a manner that supports optimal IYCF. A study on the labeling practices of CPCF in South Africa, using the MIYCN WG interim guidance, concluded that CPCF labels do not sufficiently protect and promote optimal infant and young child feeding practices (Sweet 2012; Sweet et al. 2012). Other international guidelines, regulations and standards that offer limited guidance on the marketing of CPCF are highlighted in **Table 1**.

The gap in guidance led the member states of the 65th WHA to request that the Director General ‘provide clarification and guidance on the inappropriate promotion of foods for infants and young children cited in resolution WHA63.23, taking into consideration the on-going work of the Codex Alimentarius Commission’ (WHA 2012). The timeline and consequences of the various WHA resolutions, decisions and WHO actions pertaining to IYCF are illustrated in **Figure 1**.

The World Health Organization (WHO) formed a Scientific and Technical Advisory Group (STAG) that released a ‘Technical Paper on Definition of Inappropriate Promotion of Foods for Infants and Young Children’ in June 2013, before the 67th WHA in 2014 (WHO, 2013). The 67th WHA acknowledged the work and requested that it be completed before the end of 2015 for consideration by Member States at the 69th WHA. To this end, the WHO STAG released a “Discussion paper: Clarification and Guidance on Inappropriate Promotion of Foods for Infants and Young Children’ in July 2015 for comment and consultation towards presentation at the WHA in May 2016 (WHO 2015).

National labelling legislation

At the national level, some countries have developed legislation that stipulates specific labeling requirements for foods for infants and young children that are wide ranging in both the age range covered and the extent of the guidance. The regulations in the 4 countries included in the study are depicted in **Figure 2**.

Table 1. International guidelines, regulations and standards that offer guidance relevant to the marketing of commercially-produced complementary foods

International Instruments	Includes guidance relevant to the marketing of and practices related to commercially-produced complementary foods
<p>The International Code of Marketing of Breast-milk Substitutes (the <i>Code</i>) (WHO, 1981)</p>	<p>Only when complementary foods are represented as suitable, with or without modification, for use as a partial or total replacement of breast milk.</p>
<p>Subsequent relevant WHA resolutions* *Only lists the most relevant resolutions.</p>	<p>Offers limited guidance.</p> <ul style="list-style-type: none"> • WHA Res. 63.23: Urges Member States “to end inappropriate promotion of food for infants and young children and to ensure that nutrition and health claims shall not be permitted for foods for infants and young children, except where specifically provided for, in relevant Codex Alimentarius standards or national legislation” (WHA, 2010); • WHA Res. 49.15: Urges Member States “to ensure that complementary foods are not marketed for or used in ways that undermine exclusive and sustained breast-feeding” (WHA, 1996); • WHA Res. 39.28: requests the Director-General to direct the attention of Member States and other interested parties to the following: “any food or drink given before complementary feeding is nutritionally required may interfere with the initiation or maintenance of breastfeeding and therefore should neither be promoted nor encouraged for use by infants during this period” (WHA, 1986).
<p>Codex Alimentarius Standards/Guidelines* *Only lists commodity standards and guidelines for complementary foods, but not relevant general Codex texts .</p>	<p>Offers limited guidance on product labeling.</p> <ul style="list-style-type: none"> • Codex standard for canned baby foods (CODEX STAN 73-1981. Amendment 1983, 1985, 1987, 1989) (Codex Alimentarius, 1981). • Codex standard for processed cereal-based foods for infants and young children (CODEX STAN 74-1981, REV. 1-2006) (Codex Alimentarius, 2006) • Guidelines on formulated complementary foods for older infants and young children (CAC/GL 8-1991) (Codex Alimentarius, 1991 and revised in 2013)
<p>The Global Strategy for Infant and Young Child Feeding (WHO, 2003)</p>	<p>Offers limited guidance.</p> <p>Appeals to all governments to protect, promote and support optimal infant and young child feeding, defined as exclusive breastfeeding for the first six months of life with continued breastfeeding up to two years or beyond; and to promote timely, adequate, safe and appropriate complementary feeding from six months of age.</p>

Figure 1. Timeline and consequences of the various WHA resolutions, decisions and WHO actions

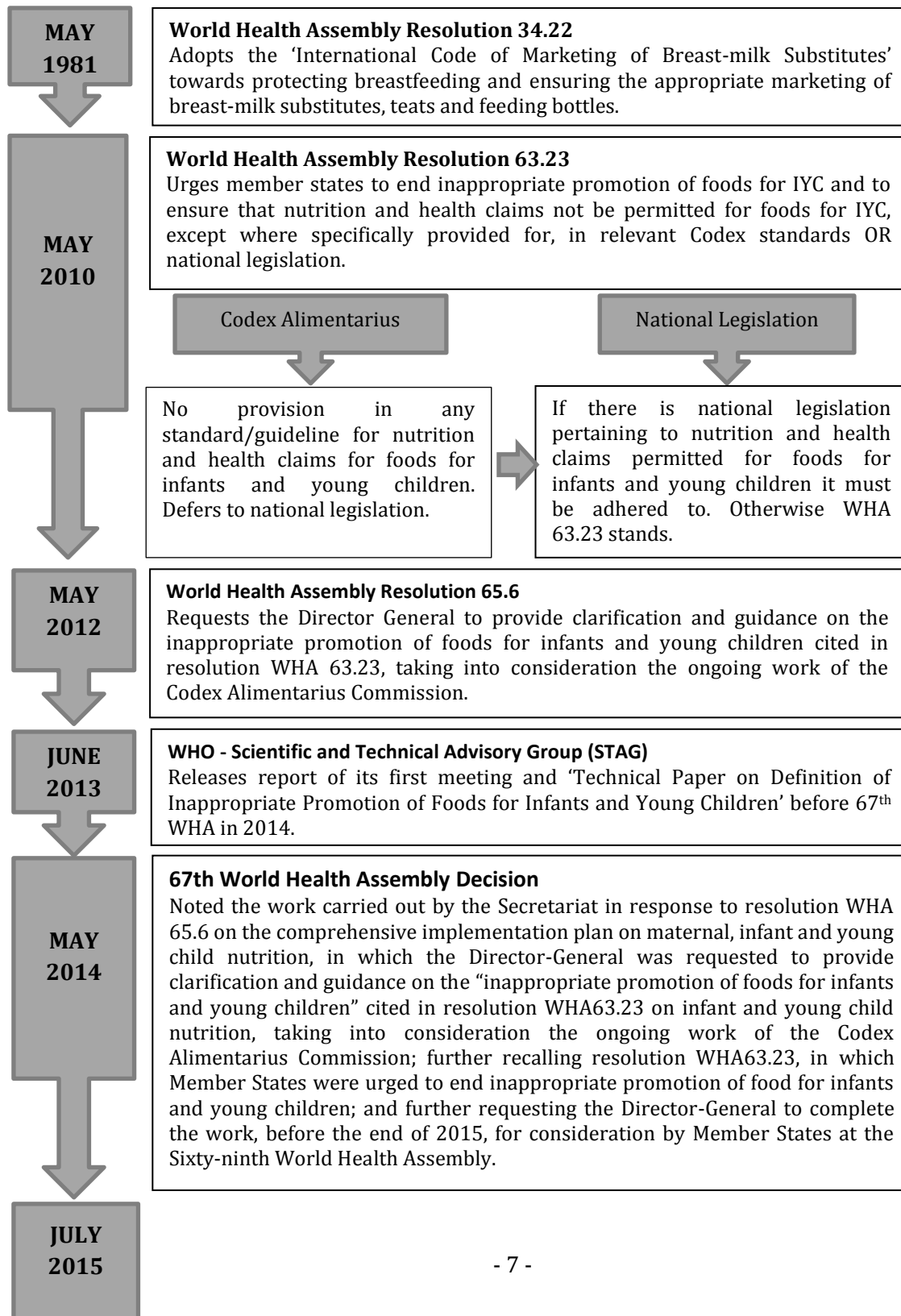
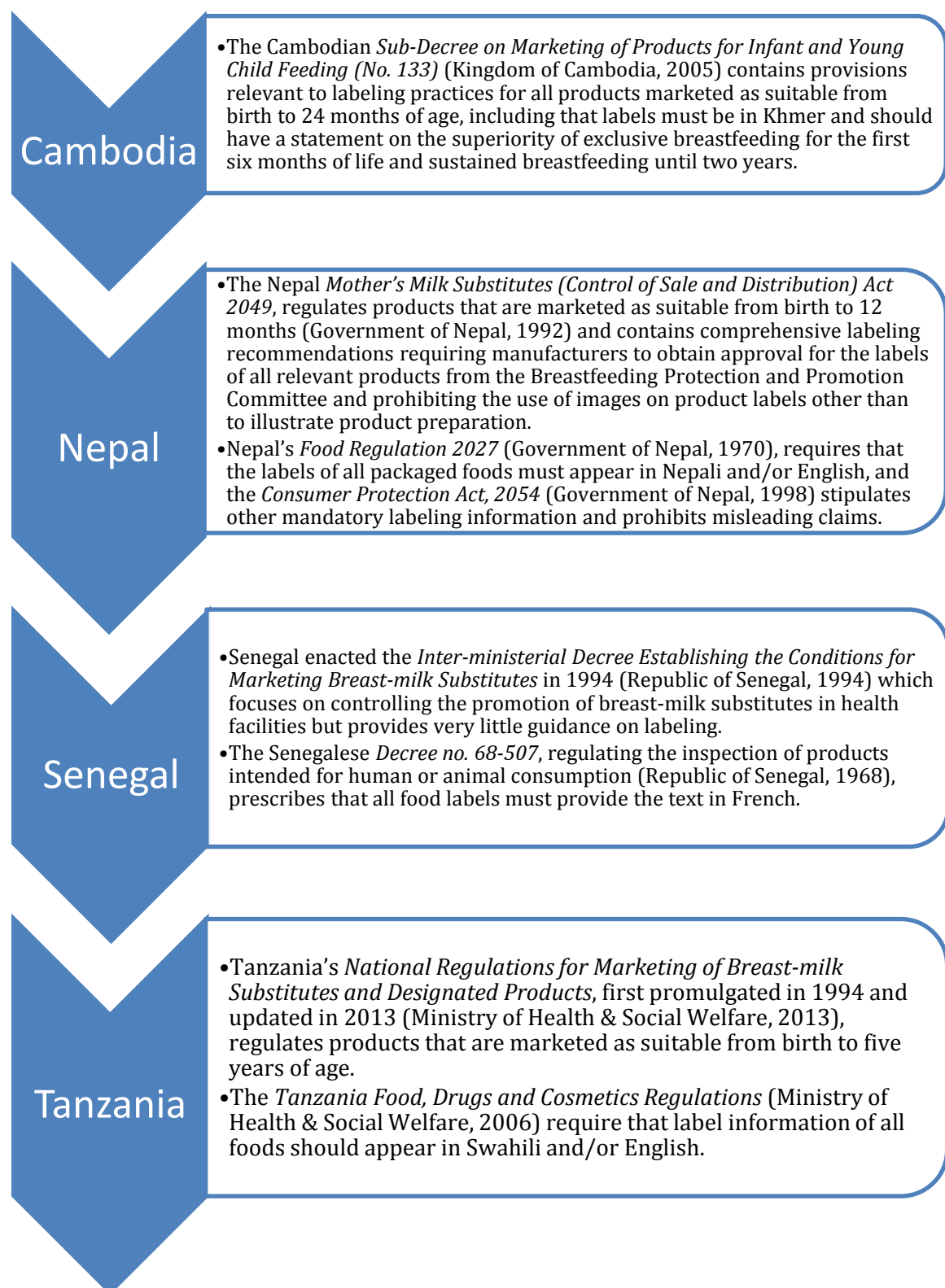


Figure 2. Summary of regulations pertaining to commercially produced complementary foods in Cambodia, Nepal, Senegal, Tanzania



METHODS

Study design and research setting

In this cross-sectional survey, CPCF available for sale in the most populous metropolitan areas in Cambodia, Tanzania, Nepal, and Senegal, were purchased and the information provided on the labels was assessed for adherence to international guidance and national legislation.

CPCF were defined in this study as any commercially-produced food or beverage product, excluding breast-milk substitutes (infant formula, follow-up formula, growing-up/toddler milks and formulas for special medical purposes) that contains a label indicating that the product is intended for children <2 years of age, by:

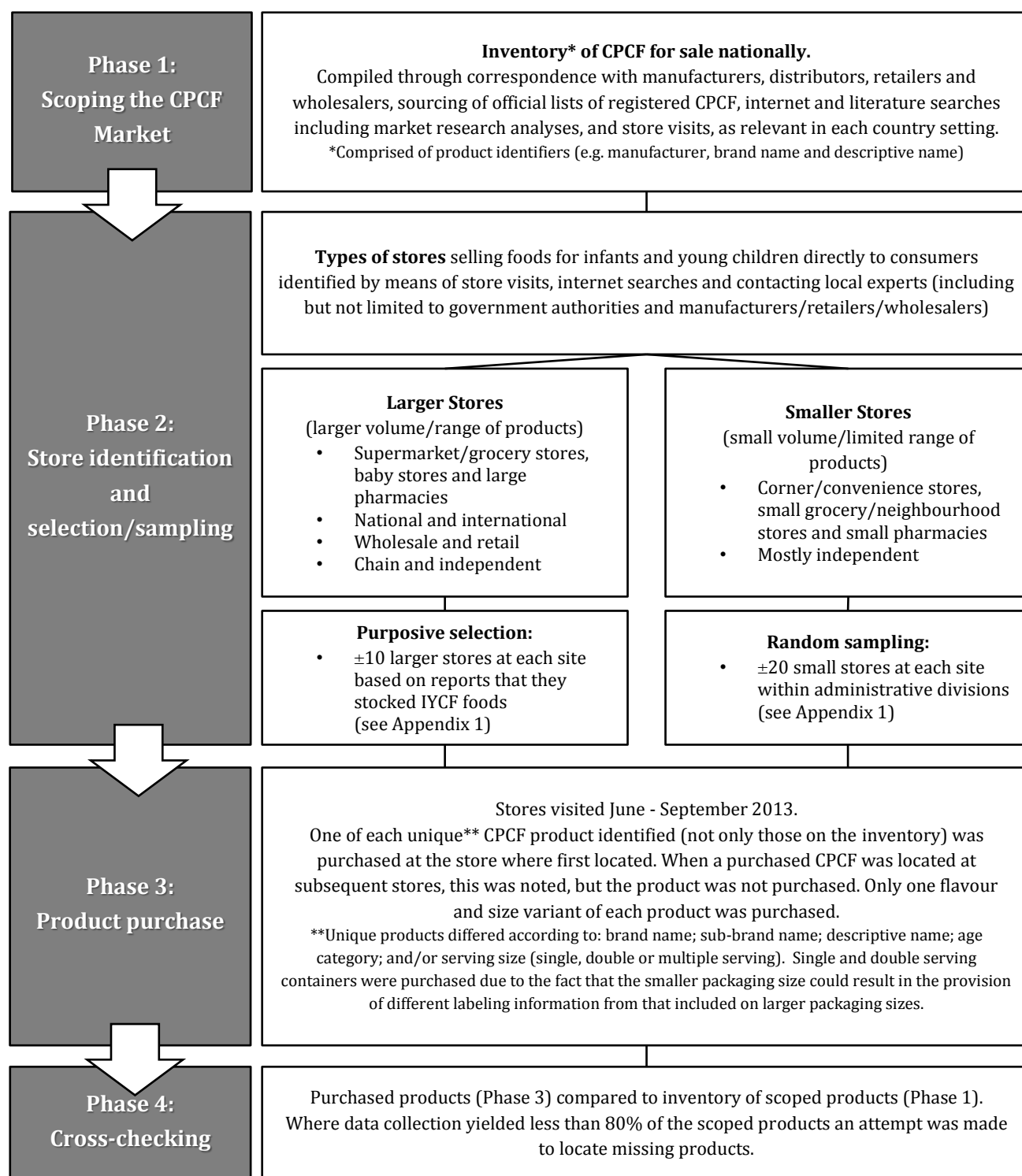
- Using the words baby/babe/infant/toddler/young child in the context of a child's age e.g. baby food (food for babies), not the size/maturity of the product e.g. baby potato (young potato),
- Recommending an age of introduction less than two years on the label, or
- Using an image of a child appearing younger than two years of age or an image/text of infant feeding (which could include a bottle).

Types of CPCF assessed in this study included, but were not limited to cereal/porridge, homogenised/pureed food, snacks/finger food, tea/water/juice.

Two Asian and two African countries were included in order to provide geographical diversity. Cambodia, Nepal, Senegal and Tanzania were selected as Helen Keller International already had an active presence in these countries and they represented regional diversity within Asia and Africa, respectively. Based on research conducted by Sweet et al. (2012), where 81% of products found in three out of nine provinces in South Africa were available in the country's most populous province of Gauteng, it was expected that many of the products available nationally in the 4 study countries would be available in the largest city/metropolis. Data collection was conducted in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam, representing 10% (NIS et al., 2011), 6% (MOPH et al., 2012), 21% (NASD, 2010) and 7% (NBS et al., 2011) of their countries' populations, respectively.

Figure 3 presents a flow diagram of the data collection process. A scoping phase (Phase 1) was conducted to create an inventory of CPCF available nationally. Phase 2 involved store identification and selection/sampling. It was anticipated that the majority of products manufactured by large/medium enterprises and sold nationally could be purchased from a purposive selection of larger store types (Sweet et al., 2012), while products manufactured by local small and medium enterprises (SMEs), that might not be distributed through formal distribution channels, could be purchased from smaller stores. Smaller stores, of which there were many, were randomly sampled (see Appendix 1) as it was not possible to obtain a list of all smaller stores per study site. Product purchasing was conducted in Phase 3, and the Phase 1 scoping activity was used to determine whether the product purchase conducted in each site yielded at least 80% of the products scoped. A cross checking (Phase 4) was used to determine if the 80% of the products identified in Phase 1 had been purchased or if additional product purchase was necessary.

Figure 3. Data collection process.



Over 80% of the scoped products in Kathmandu Valley and Dakar Department were purchased during Phase 3 (Table 1). In Phnom Penh the number of scoped products purchased fell just below the 80% target (Table 1) but the identification and purchase of 50 additional products not on the inventory was considered to yield a sufficient total number of products.

For Dar es Salaam, the cross-checking revealed that it was necessary to attempt to locate the missing scoped products, but only one product was then found and purchased in Phase 4. It was subsequently established that the market in Tanzania is complex and despite the requirement for the registration of all products, which contributed to the inventory, different products are available at different times.

Table 1. Products scoped and purchased during phase 1, 3 and 4 of data collection per study site

Research site	Phase 1: Scoping the CPCF market	Phase 3: Product purchase		Phase 4: Cross-checking
	Number of products identified	Percentage of scoped products found and purchased	Number of additional* products found and purchased	Number of 'missing' scoped products purchased
Phnom Penh	26	76.9	50	NA
Kathmandu Valley	18	88.9	6	NA
Dakar Department	83	83.0	15	NA
Dar es Salaam	30	66.7	5	1

*Not identified during Phase 1.

Data extraction, entry and analysis

Product labels were photographed or scanned and the images uploaded to a central digital folder. In each country, labels in the official national language [Khmer in Cambodia (Kingdom of Cambodia, 2005); Nepali and/or English in Nepal (Government of Nepal, 1970); French in Senegal (Republic of Senegal, 1968); Swahili and/or English in Tanzania (Ministry of Health & Social Welfare, 2006)] were professionally translated to English (unless accompanying English text was provided) and 10% were back-translated to check for quality. Three labels containing Khmer text, 7 labels with Nepali text, 63 labels with French text, and 1 label with Swahili text required translation. If none of the label text was provided in the official language of the country, as was the case for 95.7%

(n=67) of labels from Phnom Penh and 8.3% (n=7) of labels from Dakar Department, only the images on the label were assessed, as it was assumed that mothers/caregivers would only be literate in the country's official language, but would use pictures when making purchasing decisions. Thus all labels from Kathmandu Valley and Dar es Salaam, 91.7% of labels from Dakar Department, and a mere 4.3% (n=3) from Phnom Penh had both their text and images assessed.

One researcher carried out data extraction by entering all predetermined categories of descriptive data from the product label into Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA, USA). Label information from the data extraction database was used to complete a CPCF labeling practices checklist based on a modified and adapted version used by Sweet, et al. (2012) & Sweet (2012). The Sweet et al. checklist was based on the guidance provided in the International Code of Marketing of Breast-milk Substitutes and subsequent relevant World Health Assembly resolutions and 'Using the Code of Marketing of Breast-milk Substitutes to Guide the Marketing of Complementary Foods to Protect Optimal Infant Feeding Practices'.

The checklist included questions related to language, age-related recommendations, images, feeding instructions/recommendations, infant and young child feeding messages, preparation, use and storage instructions, warnings, recommended daily ration/serving sizes, cross-promotional practices, required label information and, nutrition and health claims. **Table 2** provides the checklist information.

Table 2. Commercially-produced complementary food labeling practices checklist

No.	Labeling practice questions:	Answers:	Criteria for choosing answers:
1	Is the product label written in the appropriate language(s) of the country in which the product is sold?	Yes*	All label information is written in official language/s.
		Partial	Some (not all) label information is written in official language/s.
		No	No label information is written in official language/s.
2	Does the insert contain any required label information that is NOT present on the label?	Yes	The insert includes required label information that is NOT provided on the label .
		No*	Information provided in the insert is: (a) Required label information that is also provided on the product label ; and/or (b) Non-required label information.
		NA	No insert
3	Does the product label specify a recommended age of introduction that is less than 6 months of age?	Yes	Recommended age of introduction is less than 6 months of age (180 days / the 7th month of life).
		No*	Recommended age of introduction is 6 months of age (180 days / the 7th month of life) or later.
		NA	The label does not specify an appropriate / recommended age of introduction.
4	Does the product label give instructions indicating how to feed the product to infants younger than six months?	Yes	
		No*	

No.	Labeling practice questions:	Answers:	Criteria for choosing answers:
5	Does the product label include phrases such as 'from the start'; 'for the whole family' or 'first stage'?	Yes	The product label uses words or phrases that may, directly or indirectly, indicate that the product is suitable for use from birth; for infants younger than 6 months; for all infants; for the whole family including infants younger than 6 months; + No 'age of intro' / An 'Age of intro' < 6 months
		Partial	The product label uses words or phrases that may, directly or indirectly, indicate that the product is suitable for use from birth; for infants younger than 6 months; for all infants; for the whole family including infants younger than 6 months; + An 'Age of intro' that is equal to or > 6 months
		No*	The product label doesn't include any such words/phrases.
6	Does the product label include the following messages:		
6.1	An appropriate/recommended age for use of the product that is six months (180 days) or more.	Yes*	Recommended age of introduction is from 6 months of age (180 days / the 7th month of life) or later.
		No	(1) Recommended age of introduction is before 6 months of age (180 days / the 7th month of life); OR (2) No age of introduction is specified.
6.2.1	The importance of exclusive breastfeeding for the first six months of life;	Yes*	A message including <u>all three</u> of the following concepts: (a) exclusive; (b) breastfeeding; (c) first 6 months.
		No	No message
		Partial	A message including one or two of the three concepts: (a) exclusive; (b) breastfeeding; (c) first 6 months.
6.2.2	Is a recommendation regarding exclusive breastfeeding for the first six months of life weakened by a message regarding feeding practices for infants and young children?	Yes	A message is provided regarding feeding practices for infants and young children that contradicts, undermines, or offers an alternative to or implies an exception to the recommendation to exclusively breastfeed for the first six months of life.
		No*	The recommendation to exclusively breastfeed for the first six months of life is not weakened by messages provided regarding feeding practices for infants and young children.
		NA	The answer to Question 6.2.2 is "No".
6.3.1	The importance of the addition of complementary foods from six months of age with continued breastfeeding up to two years or beyond;	Yes*	A message including <u>all three</u> of the following concepts: (a) the addition of complementary foods from six months; (b) continued breastfeeding (after six months); (c) up to two years or beyond.
		Partial	A message including <u>one or two</u> of the three concepts.
		No	No message
6.3.2	Is a recommendation regarding complementary feeding weakened by a message regarding feeding practices for infants and young children?	Yes	A message is provided regarding feeding practices for infants and young children that contradicts, undermines, or offers an alternative to or implies an exception to the complementary feeding recommendation.
		No*	The complementary feeding recommendation is not weakened by a message regarding feeding practices for infants and young children.
		NA	The answer to Question 6.3.1 is "No".
6.4	Instructions for safe and appropriate preparation and use.	Yes*	Label provides <u>both</u> of the following: (a) preparation and usage instructions; (b) at least one safety message (preparation or use).
		Partial	Label provides <u>a) without b)</u> : (a) preparation and usage instructions; (b) at least one safety message (preparation or use)
		No	No instructions.
6.5	A recommendation to feed the	Yes*	Recommendation to feed the product with a spoon.

No.	Labeling practice questions:	Answers:	Criteria for choosing answers:
	product with a spoon. NOTE: Select 'Not applicable' for Tea / Juice / Water / Milkshake powder AND Snacks / Finger Foods (excluding rusks that are used to make porridges)	Partial	A picture of a spoon is used on the label.
		No	No recommendation (pictorial or text).
		NA	
6.6	A proposed daily ration/serving. (Or recommended number of servings per day and serving)?	Yes*	Label provides both of the following: (a) a proposed daily ration (even if calculated) / recommended number of servings per day; AND (b) serving size.
		Partial	Label provides one of the following: (a) a proposed daily ration/recommended number of servings per day; OR (b) serving size.
		No	No proposed daily ration/recommended number of servings per day nor serving size
6.7	Instructions for safe and appropriate storage?	Yes*	Label provides instructions for storage.
		No	No storage instructions
6.8	Ingredients list?	Yes*	
		No	
6.9	The nutrition composition/ analysis of the product?	Yes*	
		No	
6.10	Batch number?	Yes*	
		No	
6.11	Best before date?	Yes*	
		No	
7	Does the product label recommend feeding the product in a bottle?	Yes	The product label recommends/gives instructions for how to feed the product in a bottle.
		No*	The product label makes no mention of bottle feeding.
8	Does the product label show an image of a feeding bottle?	Yes	
		No*	
9	Does the product label recommend feeding the product in a soft or semi-soft form? Select 'Not Applicable' for all categories of products except Cereal/Porridge. Applies to rusks that are used to make porridges.	Yes*	Recommendation to feed the product in a soft or semi-soft or semi-solid or thick form (using these words).
		Partial	(1) No recommendation but uses an image of the product heaped on a spoon . (2) No recommendation but uses the words soft or semi-soft or semi-solid or thick to describe the product.
		No	(1) No recommendation nor images as described above. (2) Recommendations to feed the product in a liquid form.
		NA	For the following category of products: Gravy / Soup Mix; Tea / Juice / Water / Milkshake powder; Homogenized / Pureed food; Frozen / Fresh food; Snacks / Finger foods. Applies to rusks that are used to make porridges.
10	Does the product label recommend feeding the product in a liquid form? Select 'Not Applicable' for Gravy / Soup Mix; Tea / Juice / Water / Milkshake Powder.	Yes	Recommendation to feed the product in a liquid form.
		Partial	No recommendation but uses an image of the product pouring off the spoon .
		No*	No recommendation or image
		NA	For the following category of products: Gravy / Soup Mix; Tea / Juice / Water / Milkshake powder
11	Does the daily ration (or a recommended serving size combined with a recommended frequency of feeds per day) included on the product label exceed the recommended energy intake from complementary foods		For products where an age of introduction is not provided, answer the question for all age categories.

No.	Labeling practice questions:	Answers:	Criteria for choosing answers:
	for a breastfed child provided below?		
11.1	6 - 8.9 months : 837 kJ/day (200 Kcal/day)	Yes	Greater than
		No*	Less than
		Insufficient Information	No daily ration (nor a recommended serving size nor Energy content) provided.
		NA	Product not recommended for this age group (age of introduction from 9 months or older).
11.2	9 - 11.9 months : 1,255 kJ/day (300 Kcal/day)	Yes	Greater than
		No*	Less than
		Insufficient Information	No daily ration (nor a recommended serving size nor Energy content) provided
		NA	Product not recommended for this age group (age of introduction from 12 months or older).
11.3	12 - 23.9 months : 2301 kJ/day (550 Kcal)	Yes	Greater than or equal to
		No*	Less than
		Insufficient Information	No daily ration (nor a recommended serving size nor Energy content) provided
		NA	Product not recommended for this age group (age of introduction from 2 years or older).
12	Does the product label include a stipulated warning?	Yes*	Warnings stating the health hazards/potential risks of inappropriate preparation, use and storage or advising against certain practices (preparation, use or storage).
		No	None
13	Does the product label include images of babies appearing to be older than six months of age?	Yes*	<p>Pictures of babies showing achievement of physical or developmental milestones clearly reached after six months of age:</p> <ul style="list-style-type: none"> (a) Standing with assistance; (b) Hands-and-knees crawling; (c) Walking with assistance; (d) Standing alone; (e) Walking alone; (f) 2 teeth; (g) More than 2 teeth. (h) Peddling a tricycle (i) Running (j) Holding objects such as a spoon/cup and self-feeding (k) Kicking a ball (l) Standing on tip toes <p>NB: If the label carries multiple images of children, ALL of the images have to qualify for one of the milestones (a) to (l) above before the answer 'YES' can be selected.</p>
		Unclear	<p>Pictures of babies showing 'Milestones: Other / Unclear'.</p> <p>NB: If the label carries multiple images of children, select unclear if none of the images qualify for a 'No' answer, and at least one qualifies for an 'unclear' answer.</p>

No.	Labeling practice questions:	Answers:	Criteria for choosing answers:
		No	(1) Pictures of infants/young children showing physical or developmental milestones commonly associated with infants 0 to 6 months of age such as: (a) 1 tooth; (b) Holding a toy and shaking it; (c) Lying down; (d) Lying on stomach and pushing up to elbows; (e) No teeth; (f) Reclining; (g) Sitting with support; (h) Sitting without support; (2) Head shot of infant (including baby in mothers arms) with no physical or developmental milestones reached after 6 months displayed. (3) Heavily stylized image of a baby with no physical or developmental milestones reached after 6 months displayed. NB: If the label carries multiple images of babies, even if only one of the images displays an infant that fulfils points (1), (2) or (3) above, select NO.
		NA	No images of infants/young children on the label
13.1	Does the product label include an image/ images of baby animals displaying physical or developmental milestones commonly associated with infants younger than six months of age?	Yes	Picture of a baby animal (e.g. a bear) displaying physical or developmental milestones commonly associated with infants younger than six months of age: Lying down; Lying on stomach and pushing up to elbows; Reclining; Sitting with support; Sitting without support.
		No*	Any other image of a baby animal.
		NA	No image of a baby animal on the label.
14	In the case of manufacturers that produce both breast-milk substitutes and complementary foods, is the product labeled in a way that also promotes the company's infant or follow up formula by using similar: ① Color schemes or designs ② Names ③ Slogans, mascots or other symbols as used for their infant formula or follow up formula brands?	Yes	Similarities in one or more of the listed elements.
		No*	None of the listed similarities
		NA	Company doesn't sell infant formula/follow-up formula/breast-milk substitutes in the country.
14.1	In the case of manufacturers that produce both breast-milk substitutes and complementary foods, is the product labeled in a way that also promotes the company's breast-milk substitutes (e.g. infant or follow-up formula) by including pack-shots of such products on the label and/or directly referring to the company's IF/FUF/GUM? (e.g. to prepare the cereal with the manufacturers FUF)	Yes	Product contains front-of-pack shots of the manufacturers breast-milk substitute. Product contains preparation instructions / infant feeding messages / claims that refer to the manufacturers breast-milk substitute (infant formula/follow up formula/growing up milk)
		No*	
		NA	Company doesn't sell breast-milk substitutes (e.g. infant formula or /follow-up formula) in the country.
14.2	In the case of manufacturers that produce both breast-milk substitutes and complementary foods, is there an invitation on the label to make contact (direct or indirect) with the company's	Yes	E.g. "Contact our nutrition experts" or a web link to a company sponsored baby club or IYCF information/ education service. Does not include the provision of company contact details for the purpose of reporting product defects or quality issues. Quick response (QR) code & website are always considered an invitation to contact; needs to be checked with other label content.

No.	Labeling practice questions:	Answers:	Criteria for choosing answers:
	marketing personnel?	No*	A customer care line, email address and postal address (without any other wording such as 'contact out nutrition experts') is considered to be company contact details for the purpose of reporting product defects or quality issues.
		NA	Company doesn't sell infant formula/follow-up formula/breast-milk substitutes in the country.
15	Does the product label make any nutrient content claims?	Yes	
		No	
16	Does the product label make any nutrient comparative claims?	Yes	
		No	
17	Does the product label make any nutrient function/other function claims?	Yes	
		No	
18	Does the product label make any reduction of disease risk claims?	Yes	
		No	

*Reflecting 'best practice', which is not applicable when the answer is NA.

Images of infants/young children on labels were considered inappropriate if they did not include physical or developmental milestones clearly reached from the age six months or if it was difficult to judge their age. For example, images that showed an infant displaying physical/developmental milestones commonly achieved by a child younger than six months (e.g. an infant lying on their stomach and pushing up, or with no teeth) were interpreted as implying an age of introduction < six months (CDC, 2011; WHO, 2006).

A second researcher randomly selected and cross-checked 10% of the data. Disagreements regarding information extracted were resolved by consensus and where consensus could not be reached, a third researcher made the final decision. Two researchers independently completed the checklist and reached consensus for all answers in Phnom Penh and Dar es Salaam. In 0.31% of checklist answers in Dakar Department and 0.65% in Kathmandu Valley, a third researcher made the final decision in consultation with the other researchers.

The data were imported into statistical software STATA v10 (StataCorp, College Station, TX, USA). Descriptive statistics were used to present a record of current labeling practices.

RESULTS

The number of CPCF products assessed in this study was 70 in Phnom Penh, 22 in Kathmandu Valley, 84 in Dakar Department, and 26 in Dar es Salaam. Infant cereals were the most common product type in Kathmandu Valley and Dar es Salaam, while more purees were available in Phnom Penh and Dakar Department, representing over 40% of products. Between 1.4%-36.4% of products in all four sites were locally produced and Nestlé, Danone and Heinz produced the largest number of products, except in Dar es Salaam where no Danone products were found (**Table 3**).

Table 3. Type and manufacturers of CPCF products for sale in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam

	Phnom Penh	Kathmandu Valley	Dakar Department	Dar es Salaam
	N (%)	N (%)	N (%)	N (%)
Type of product				
Infant cereals	17 (24.3)	21 (95.5)	36 (42.8)	20 (76.9)
Purees	30 (42.9)	1 (4.5)	39 (46.4)	4 (15.4)
Snack/finger foods	14 (20.0)	0	3 (3.5)	2 (7.7)
Juices/waters	9 (12.9)	0	6 (7.1)	0
Total Products	70 (100.0%)	22 (100.0%)	84 (100.0%)	26 (100.0%)
Locally produced products	1 (1.4)	8 (36.4)	4 (4.8)	8 (30.8)
Imported products	69 (98.6)	14 (63.6)	80 (95.2)	18 (69.2)
Africa	0	0	6 (7.1)	3 (11)
Asia	11 (15.7)	12 (55)	0	0
Europe and UK	23 (32.8)	2 (10)	62 (73.8)	12 (46.2)
USA	22 (31.4)	0	0	0
Other	13 (18.6)	0	12 (14.3)	3 (11.5)
Number of manufacturers	16	12	18	11
Manufacturers of products				
Nestlé	28 ¹ (40.0)	9 (40.9)	17 (20.2)	7 (26.9)
Danone	8 ² (11.4)	3 ³ (13.6)	36 ² (42.9)	0
Heinz	11 (15.7)	1 (4.5%)	4 (4.8)	5 (19.2)
Cow & Gate	0	0	2 (2.4)	5 (19.2)
Other	23 (32.9)	9 (40.9)	25(29.8)	9 (34.6)

In all four sites, none of the CPCF labels were found to be compliant with all of the labeling checklist requirements.

¹ Includes both Nestlé and Gerber products, as the latter is a subsidiary of the Nestlé Group.

² Includes both Danone and Bledina products, as the latter is a company of the Danone Group.

³ Includes Nutricia products and Farex brands, as both are now part of the Danone Group.

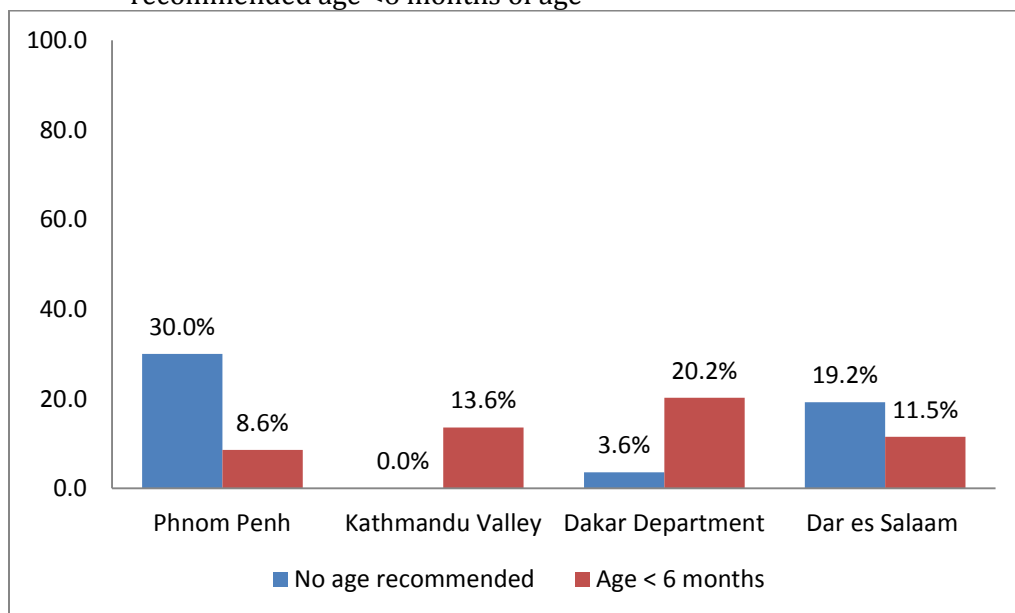
Languages used on labels and required label information

In Phnom Penh, none of the labels provided all label text in Khmer (the language required by national regulation). Three (4.3%) labels provided some label text in Khmer, 67 labels (95.7%) provided no text in Khmer (text was provided in French, English, Thai, Vietnamese, Arabic, Malaysian, Indonesian or Mandarin). In Dakar Department, 89.3% (n=75) of labels contained all text in French (the language required by national regulation), 2.4% (n=2) contained some text in French and 8.3% (n=7) did not have any French on the label. In Kathmandu Valley, all labels were in either English and/or Nepali (national regulation permits either language). All the text was in Nepali on 36.4% (n=8) of labels and 63.6% (n=14) had all text in English with no Nepali text. In Dar es Salaam, 96.2% of labels were in English and/or Swahili as required by national regulation.

Age-related recommendations, images, feeding instructions and phrases

Between 8.6% and 20.2% of products from all 4 sites recommended an age of introduction of less than six months. Most of these recommended use from 4 months except for two products from Kathmandu Valley which recommended use from 5 months. Kathmandu Valley was the only site where all products provided an age recommendation, while 70% - 96.4% of products in the remaining sites provided an age recommendation (**Fig. 4**).

Figure 4. Percentage of CPCF labels that provided no recommended age of introduction (months) or a recommended age <6 months of age



Many labels included images of infants or young children: 37.1% in Phnom Penh, 22.7% in Kathmandu Valley, 14.3% in Dakar Department, and 38.5% in Dar es Salaam. Some images suggested that they were suitable for infants <6 months of age (see **Figure 5**) through depictions of physical or developmental milestones. An image of an infant displaying a developmental milestone commonly associated with infants <6 months of age, or no clear milestone reached after six months of age, was found on 24 CPCF labels in Phnom Penh, 3 labels in Kathmandu Valley, 9 labels in Dakar Department and 2 labels in Dar es Salaam, representing 92.3%, 60%, 75%, and 20 % of the labels with images of infants/young children in each site, respectively.

Few products provided instructions on how to feed the product to infants younger than six months (Phnom Penh 1.4% (n=1), Kathmandu Valley 9.1% (n=2), Dakar Department 8.3% (n=7), Dar es Salaam 0%). More often, a phrase that may indicate that the product is suitable for use for infants <6 months, such as 'Stage 1', 'All ages first food', was found on product labels (Phnom Penh 1.4% (n=1), Kathmandu Valley 22.7% (n=5), Dakar Department 13.2% (n=11), Dar es Salaam 30.8% (n=8)) but in most cases, these labels also provided text giving an appropriate age of introduction, from six months.

Although Cambodia and Nepal prohibit images on the labels of foods for infants and young children, unless they are displaying preparation and use instructions, all products in Phnom Penh and Kathmandu Valley displayed at least one image that was not related to preparation and use. Images of the product ingredients/composition were the most common type of images used on labels in all 4 sites, appearing on 91.4% (n=64), 95.5% (n=21), 94.1% (n=79) and 80.8% (n=21) of labels in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam respectively. Other popular image types included: the ready-to-eat/prepared product (48.6%; n=34) and brand mascots (41.4%; n=29) in Phnom Penh; a jug of milk (95.5%; n=21) and a feeding bowl (86.4%; n=19) in Kathmandu Valley; brand mascots (78.6%; n=66) and scientific images/branded ingredient (52.4%; n=44) in Dakar Department; and the ready-to-eat/prepared product (57.7%; n=15) and a feeding bowl (57.7%; n=15) in Dar es Salaam. In Phnom Penh, 21% of product labels used an image of an ingredient that could be considered misleading when compared to the product's ingredient list (data not shown).

Figure 5. Images of infants displaying physical or developmental milestones commonly achieved before six months of age found on CPCF labels in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam



No visible teeth
Phnom Penh



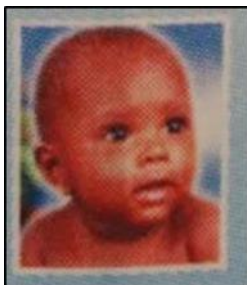
Sitting with support
Phnom Penh



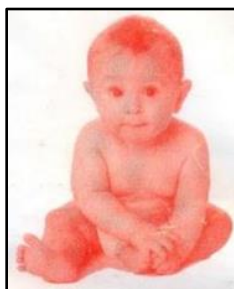
Sitting with support
Katmandu Valley



Difficult to tell age of child
Dakar Department



No teeth visible
Dakar Department



Absence of a clear milestone reached
after six months of age
Dar es Salaam



Absence of a clear milestone
reached after six months of age

IYCF messages

A message stating the importance of exclusive breastfeeding for the first six months of life in the language required by national legislation was provided on 4.3% (n=3), 27.3%, 3.6% (n=3) and 26.9% of labels in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam, respectively. Few labels (2.9% (n=2) and 2.4% (n=2)) in Phnom Penh and Dakar Department, respectively, and no labels in Kathmandu Valley and Dar es Salaam) provided a complete message including both the importance of the addition of complementary foods from six months of age and to continue breastfeeding up to two years or beyond, in the language required by law. However, product labels more frequently provided one part of this message. In Kathmandu Valley, 63.6% recommended the addition of complementary foods from six months; 45.5% recommended continued breastfeeding, but none recommended breastfeeding to two years or beyond. In Dakar Department, 9.5% (n=8) recommended introducing complementary foods at six months; 6.0% (n=5) recommended continued breastfeeding; and 2.4% (n=2) recommended continuing to breastfeed for two years or beyond. In Dar es Salaam, 19.2% (n=5) recommended the addition of complementary foods from six months; 11.5% (n=3) recommended continued breastfeeding and none recommended breastfeeding to two years or beyond. Almost 30.8% of labels included an additional message which weakened the appropriate feeding message by, for example, adding the phrase ‘Since babies vary in their needs, consult your healthcare professional for advice on when to introduce this product to your child’ or ‘Unless otherwise advised by your health care professional, solid foods should not be given before 4 months, and not delayed beyond 6 months.’

The message ‘Breastfeeding is best for your baby’ was provided on all labels with Khmer text (4.3% of the total) in Phnom Penh, as well as 68.2%, 1.2% (n=1) and 11.5% of labels in Kathmandu Valley, Dakar Department and Dar es Salaam. ‘Breastfeeding should continue as long as possible’ was stated on 27.3% of products in Kathmandu Valley. In Dakar Department, the most common message found on 4.7% (n=4) of products was ‘Continue breastfeeding while introducing solids’. The most common message in Tanzania was ‘Exclusive breastfeeding is recommended for up to six months’ (26.9% of labels). Fifty-five percent of labels in Kathmandu Valley, 23.1% in Dar es Salaam, 2.4% in Dakar Department and 0% in Khmer in Phnom Penh used the term ‘weaning’.

Cross-promotion and invitations to interact on CPCF produced by breast-milk substitute (BMS) manufacturers

The percentage of CPCF products sold by manufacturers that also produce BMS ranged from 34.3-70.2% (Table 4). Of these, 41.2-78.0% products were labeled in a way that may be considered to promote the manufacturers' BMS products by using similar colour schemes, designs or names as used for their infant formula, follow-up formula or growing-up/toddler milk brands (examples provided in Figure 6). In Phnom Penh and Dakar Department 8.2% and 15.3% of products respectively, directly referred to the company's BMS by including a pack-shot or recommending by name the use of the company's follow-up formula. In addition, 75.0-91.5% of CPCFs produced by BMS manufacturers included an invitation on the label, such as an invitation to join a baby club/to 'contact our nutrition experts', SMS line, website address or Quick Response (QR) codes, to make contact with the manufacturer.

Table 4. CPCF products for which the manufacturer also produces breast-milk substitutes (BMS) and, of those, labels using cross-promotion, direct reference to the BMS and invitation to contact the manufacturer

	Phnom Penh N (%)	Kathmandu Valley N (%)	Dakar Department N (%)	Dar es Salaam N (%)
CPCF products for which the manufacturer also produced BMS:	24 (34.3)	12 (54.5)	59 (70.2)	12 (46.2)
Cross-promotion	10 (41.2)	9 (75.0)	46 (78.0)	5 (41.7)
Direct reference to the BMS	2 (8.3)	0	9 (15.3)	0
Invitation to contact the manufacturer	18 (75.0)	0	54 (91.5)	10 (83.3)

Figure 6. Examples of manufacturer's cross-promotion (similar/same colour scheme, design and/or name) between CPCF and BMS products

		
<p>Infant formula Phnom Penh</p>	<p>Growing-up milk</p>	<p>Infant cereal</p>
		
<p>Infant formula Kathmandu Valley</p>	<p>Infant cereal</p>	
		
<p>Infant formula Dakar Department</p>	<p>Growing-up milk</p>	<p>Infant cereal</p>
		
<p>Infant formula Dar es Salaam</p>	<p>Infant cereal</p>	

Preparation and use instructions

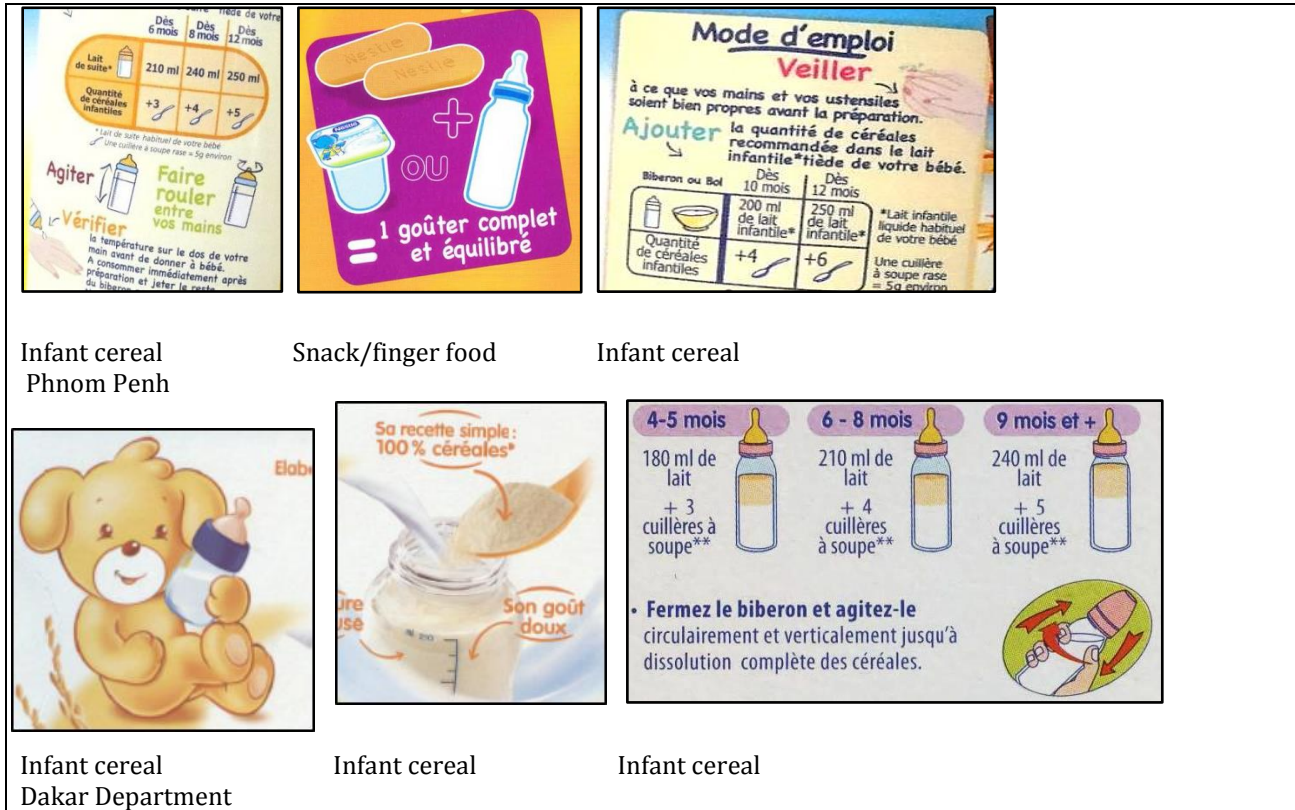
Instructions for safe and appropriate preparation and use in the appropriate language were provided on 4.3% of labels in Phnom Penh (all three labels with text in Khmer), 100.0% of labels in Kathmandu Valley, 60.7% in Dakar Department and 80.8% in Dar es Salaam. **Table 5** shows the preparation and use instructions including those products that recommended (text or an image) feeding the product in an infant feeding bottle (examples provided in **Figure 7**), with a spoon, in a soft or semi-soft form or as a liquid.

Table 5. Preparation types and instructions found on the labels of CPCFs

	Phnom Penh N (%)	Kathmandu Valley N (%)	Dakar Department N (%)	Dar es Salaam N (%)
Preparation required:				
Ready-to-eat/drink	51 (72.9)	1 (4.5)	27 (32.1)	6 (23.1)
Instant	17 (24.3)	21 (95.5)	33 (39.3)	12 (46.2)
Heat before consumption (purees) or cook and add water (cereals).	2 (2.9)	0	24 (28.6)	8 (30.8)
Recommendation (text or image) to feed with bottle.	8 (11.8)	0	18 (21.4)	0
Recommendation (text or image) to feed with a spoon (applicable products* only).	17 (36.2)	22 (100)	53 (68.0)	19 (73.1)
Recommendation (text or image) to feed in a soft or semi-soft form (applicable products* only).	12 (25.5)	2 (9.1)	5 (6.4)	0
Recommendation (text or image) on to feed the product in a liquid form (applicable products** only).	1 (1.6)	0	2 (2.6)	0

*Cereals/porridges, pureed foods and rusks if made into porridge Phnom Penh (n=47); Kathmandu Valley (n=22); Dakar Department (n=78); Dar es Salaam (n=26). **Cereals/porridges, pureed foods and snacks/finger foods Phnom Penh (n=61); Kathmandu Valley (n=21); Dakar Department (n=78); Dar es Salaam (n=20).

Figure 7. Examples of images of infant feeding bottles appearing on the labels of CPCF



Storage Instructions and Warnings

Instructions for safe and appropriate storage in the language required by national legislation were provided on 4.3% (n=3), 100% (n=22), 89.3% (n=75), 88.5% (n=23) of labels in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam, respectively. Warnings in the language required by national legislation were provided on 4.3% (n=3), 68.2% (n=15), 82.1% (n=69), 69.2% (n=18) of labels in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam, respectively.

Daily ration and serving sizes

At each study site, while most labels provided a recommended serving size, few provided sufficient information to calculate a daily ration. For those labels that did provide sufficient information, the manufacturers recommended serving size/daily ration⁴ was compared to the recommended daily energy intake from complementary foods for a

⁴ In some instances, a single serving provided energy that exceeded the recommended daily energy intake from complementary foods for the breastfed child; therefore, sometimes it was not necessary to calculate the daily ration to provide this information.

breastfed child for three respective age categories; 6-8.9 months, 9-11.9 months and 12-23.9 months, based on the global daily energy needs from complementary foods and recommended number of meals for the breastfed child, given in **Table 6** (PAHO, 2003).

As shown in **Table 6**, in Phnom Penh 14.5% (n=9), 6.2% (n=4) and 7.1% (n=5) of applicable products exceeded the recommended daily energy intake for the three age categories respectively. In Kathmandu Valley, 55.6% (n=10), 62% (=13) and 18.1% (n=4) of applicable products exceeded the recommended daily energy intake for the three age categories. In Dakar Department, 23.3% (n=17), 10.3% (n=7) and 2.4% (n=2) of applicable products exceeded the recommended daily energy intake for the three age categories respectively. In Dar es Salaam 40% (n=10), 8% (n=2) and none of applicable products exceeded the recommended daily energy intake for the three age categories respectively. In all four countries for all three age groups, there was often insufficient information provided to calculate the daily ration.

Table 6. The daily ration* included on the product label that exceeded the recommended energy intake from complementary foods for a breastfed child**

Age group	Answer	Phnom Penh		Kathmandu Valley		Dakar Department		Dar es Salaam	
		n (%)	Total n for age group	n (%)	Total n for age group	n (%)	Total n for age group	n (%)	Total n for age group
6 - 8.9 months: 837 kJ/day (200 Kcal/day)	Exceeded recommendation	9 (14.5)	62	10 (55.6)	18	17 (23.3)	73	10 (40.0)	25
	Did not exceed recommendation	3 (4.8)		0		3 (4.1)		1 (4.0)	
	Insufficient Information	50 (80.6)		8 (44.4)		53 (72.6)		14 (56.0)	
9 - 11.9 months: 1,255 kJ/day (300 Kcal/day)	Exceeded recommendation	4 (6.2)	65	13 (61.9)	21	8 (10.3)	78	2 (8.0)	25
	Did not exceed recommendation	4 (6.2)		0		2 (2.6)		7 (28.0)	
	Insufficient Information	57 (87.6)		8 (38.1)		68 (87.1)		16 (64.0)	
12 - 23.9 months: 2301 kJ/day (550 Kcal)	Exceeded recommendation	5 (7.1)	70	4 (18.1)	22	2 (2.4)	83	0	26
	Did not exceed recommendation	3 (4.3)		10 (45.5)		7 (8.4)		8 (30.8)	
	Insufficient Information	62 (88.6)		8 (36.4)		74 (89.2)		18 (69.2)	

*or a recommended serving size combined with a recommended frequency of feeds per day

**Includes product labels with daily ration or serving size plus number of meals (meal frequency), used to calculate daily ration.

Table 7 Daily energy needs from complementary foods and recommended number of meals for the breastfed child

Age (months)	Daily energy needs from complementary foods for the breastfed child [kJ/day (kcal/day)]	Number of meals of complementary foods per days
6-8	837 (200)	2-3 (plus 1-2 snacks)
9-11	1,255 (300)	3-4 (plus 1-2 snacks)
12-23	2301 (550)	3-4 (plus 1-2 snacks)

Adapted from PAHO (2003)

Nutrition and Health Claims

Nutrition and/or health claims were made on 4.3% of product labels in Phnom Penh (all 3 of the labels that were in the appropriate language), 95.5% in Kathmandu Valley, 85.7% in Dakar Department and 92.3% in Dar es Salaam and **Figure 8** depicts the nutrition/health claims categorised according to the type of claim as defined by Codex Alimentarius (Guidelines for Use of Nutrition and Health Claims CAC/GL 23-1997).

Figure 8. Percentage of total CPCF labels carrying nutrition and health claims, by category in the appropriate language/s* in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam

*As required by national legislation (Khmer in Phnom Penh, English/Nepali in Kathmandu Valley, French in Dakar Department and English/Swahili in Dar es Salaam).

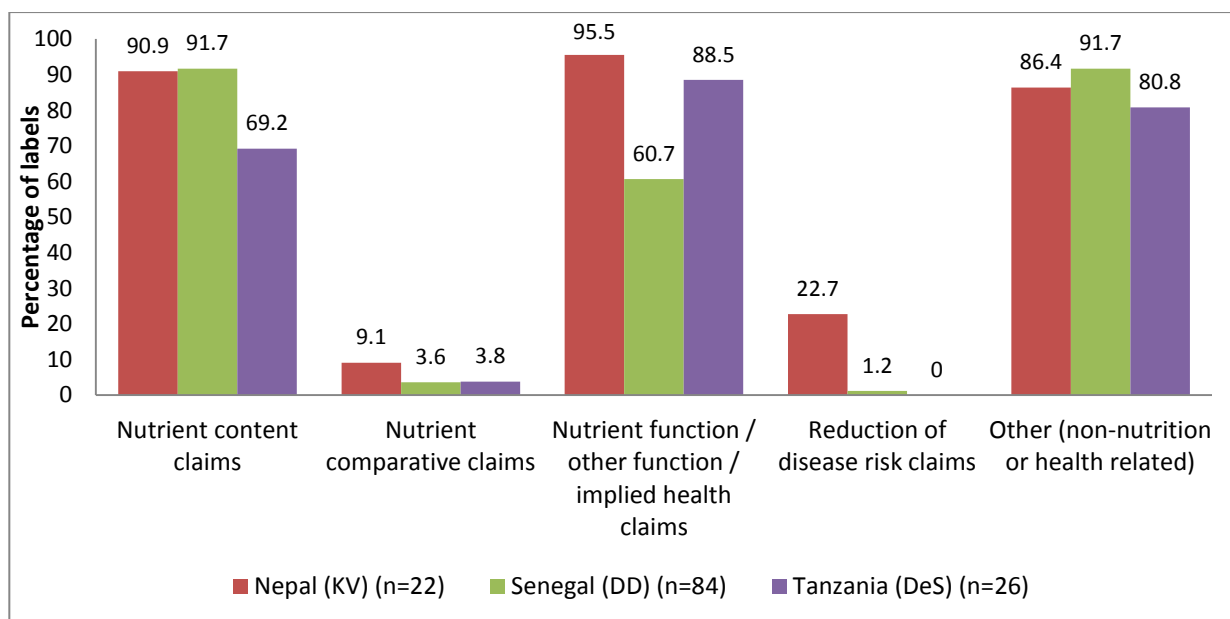


Table 8 provides examples of the most common nutrition and health claims in Kathmandu Valley, Dakar Department and Dar es Salaam, but excludes Phnom Penh as only three labels could be assessed.

Table 8. Examples of the most common nutrition and health claims on CPCF labels in Kathmandu Valley, Dakar Department, Dar es Salaam

Site	Nutrient content claims	Nutrient comparative claims	Nutrient function/other function/implicit health claims	Reduction of disease claims
Kathmandu Valley	<ul style="list-style-type: none"> • Protein • Energy • Calcium • Iron • Vitamin C 	<ul style="list-style-type: none"> • Vegetable protein is better than meat protein. • Nepal's first best full of protein product. 	<ul style="list-style-type: none"> • Nutrition/ nutritious/ nutrient-dense • Easy to digest • Immunity 	<ul style="list-style-type: none"> • Anaemia • Colds and fever • Protein-energy malnutrition
Dakar Department	<ul style="list-style-type: none"> • Iron • Vitamins • Vitamin C 	<ul style="list-style-type: none"> • Kiwi is one of the richest fruits in vitamin C. 	<ul style="list-style-type: none"> • Growth • Development • Iron function • Palate / taste development 	<ul style="list-style-type: none"> • 'Healthy flour, pre-cooked enabling to combat anaemia and all sorts of nutritional shortage, thanks to....'
Dar es Salaam	<ul style="list-style-type: none"> • Iron • Vitamin A • Vitamins and minerals • Vitamin C 	<ul style="list-style-type: none"> • ...and unlike some family breakfast cereals, they contain no added sugar, salt, artificial flavorings or preservatives. 	<ul style="list-style-type: none"> • Nutrition / nutritious • Development • Complete / all-in-one • Growth 	<ul style="list-style-type: none"> • None

Some products made use of novel formats to make nutrient function and content claims by either making use of the nutrient declaration to group nutrients according to specific functions or highlighting individual nutrients (see **Figure 9**).

Figure 9. Examples of CPCF using the nutrient declaration to make nutrient function and nutrient content claims

Ingredients	
Wheat, Soyabean, Rice, Whole Milk Powder, Sugar, Dextrose, Corn Fat, Vitamins, Minerals and Fruit Concentrate.	
Nutritional Value Per 100g.	
For Growth	
Energy	400.0 Kcal
Protein	16.0 g
Calcium	410.0 mg
Vitamin D	200.0 IU
Riboflavin	0.6 mg
Folic Acid	22.0 µg
For Energy Needs	
Carbohydrate	62.0 g
Fat	6.0 g
Thiamine	0.8 mg
Niacin	5.0 mg
Pantothenic Acid	1.5 mg
Vitamin B ₁₂	0.25 µg
Biotin	25.0 µg
For Immunity	
Vitamin A	1200.0 IU
Vitamin E	3.0 IU
Vitamin B ₆	0.3 mg
Vitamin C	35.0 mg
Iron	23.5 mg
Zinc	5.0 mg
Other Components	
Dietary Fibre	3.0 g
Ash	3.0 g
Moisture	10.0 g

BẢNG THÔNG TIN DINH DƯỠNG		
Thành phần trung bình	Trong 100g	(50g & 150ml nước)
Năng lượng (kcal)	411.4	205.7
Chất béo (g)	9.8	4.9
DHA (mg)	10	5.0
Axit linoleic (g)	1.3	0.65
Chất đạm (g)	15.3	7.65
Carbohydrate (g)	65.5	32.75
Chất xơ (g)	2.2	1.1
Natri (mg)	300	150
Canxi (mg)	400	200
Phốt pho (mg)	320	160
Vitamin A (IU)	1100	550
Vitamin D (IU)	200	100
Vitamin E (IU)	9.7	4.85
Vitamin C (mg)	45	22.5
Vitamin B ₁ (mg)	0.42	0.21
Vitamin B ₂ (mg)	0.4	0.2
Vitamin B ₆ (mg)	0.3	0.15
Niacin (mg)	4.2	2.1
Axit folic (µg)	26	13
Axit pantothenic (mg)	1.3	0.65
Vitamin B ₁₂ (µg)	1.0	0.5
Biotin (µg)	7.0	3.5
Taurine (mg)	40	20
Sắt (mg)	7.5	3.75
Iốt (µg)	47	23.5
Kẽm (mg)	2.5	1.25
Bifidobacterium lactis (cfu)	1x10 ⁸	5x10 ⁸

Kathmandu Valley

Phnom Penh

In Dakar Department, 91.7% (n=77) of products made non-nutrition/health claims, including allergen claims (72.6%; n=61), absence of additive claims (50.0%; n=42) and presence of ingredient claims (40.5%; n=34). In Kathmandu Valley, 86.4% (n=19) made these types of claims including vegetarian claims (63.6%; n=14); absence of additives claims (50.0%; n=11) and quality claims (22.7%; n=5), while in Dar es Salaam, 80.8% (n=21) of products made non-nutrition/health claims, including allergen claims (61.5%; n=16) absence of additive claims (34.6%; n=9) and vegetarian claims (26.9%; n=7). The lowest percentage (25.7%; n=18) of non-nutrition/health claims (either in Khmer or presented as symbol that would be understood even if not in the appropriate language) were on products in Phnom Penh and included organic claims (15.7%; n=11), and absence of additives claims (4.3%; n=3).

DISCUSSION

This study assessed the labels of CPCF sold in Phnom Penh, Kathmandu Valley, Dakar Department and Dar es Salaam and the findings reveal many and significant areas where they are non-compliant with national legislation, relevant WHA resolutions and recommendations made in the document 'Using the Code of Marketing of Breast-milk Substitutes to Guide the Marketing of Complementary Foods to Protect Optimal Infant Feeding Practices' (Quinn *et al.*, 2010). The labeling practices of manufacturers assessed in this study show that they do not support optimal infant and young child feeding practices and best practice.

The Global Strategy on Infant and Young Child Feeding emphasises that appropriate evidence-based feeding practices are essential for attaining and maintaining proper nutrition and health and that inadequate knowledge about appropriate foods and feeding practices are often a greater determinant of malnutrition than lack of food. The strategy recognises the role of CPCF for some mothers who have the means to buy them and the knowledge and facilities to prepare and feed them safely (WHO 2003). The labels of CPCF have a role to play in supporting optimal IYCF.

We found that the majority of CPCF (64.0-99.0%) in the sample were imported, and although 11-18 CPCF manufacturers were recorded per site, 54.0-77.0% of CPCF were manufactured by four multinational companies; revealing that the market is dominated by imported products from a few manufacturers and, contrary to what is encouraged by the Global Strategy on IYCF (WHO, 2003), there are limited locally produced products.

The importance of language

Food labels provide consumers with information about a product and assist them in making informed purchasing choices (CFIA, 2011). It is therefore important that the languages used on labels are understood by the majority of consumers. Global guidance recommends label information be provided in an appropriate language (Codex Alimentarius, 1985a; WHO, 2013) and national food regulations usually specify language requirements. In Kathmandu Valley and Dar es Salaam, where relevant regulations permit food labels to be written in either English or the local language, all or nearly all labels in this study met this requirement. Although legal, the majority of CPCF labels in Kathmandu Valley (63.7%) did not have any of the label text in Nepali, a concern as only 0.04 and 1.7% of the female population have English as their mother tongue or second language respectively (Bureau of Statistics, Thapathali, Kathmandu, 2013). In Tanzania, only 72% of women are literate in Swahili or English or both

and so it is difficult to assess how important having CPCF labels in Swahili is (National Bureau of Statistics [Tanzania] & ICF Macro, 2011). In Senegal, although the majority of labels were in the official language, French, 43% of the population are from the Wolof group (Agence Nationale de la Statistique et de la Demographie, 2010) and in 2005, only 10% of the Senegalese people were fluent French speakers and 21% partial French speakers (Organisation internationale De la Francophonie, 2007).

In Cambodia, 92% of literate Cambodians are literate only in Khmer (National Institute of Statistics, Directorate General for Health & ICF Macro, 2011). Cambodian regulations require all label text to be in Khmer, while imported products may provide mandatory information in Khmer on a sticker. Yet the majority (95.7%) of Phnom Penh CPCF labels failed to provide any label information in Khmer and none of the imported products (all but one of the total sample) provided the required sticker. The importance of language regulations and their enforcement must be considered by governments when implementing policies to promote optimal IYCF.

A high proportion of labels in the sample provided an ingredients list, batch number, 'best before' date and nutrition declaration, perhaps due to the fact that the first three are considered to be mandatory in the Codex General Standard for the Labeling of Pre-packaged Foods (Codex 1985a) and the nutrition declaration is recommended to be mandatory in the Codex Guidelines on Formulated Complementary Foods for Older Infants and Young Children (Codex, 1991). Many national regulations follow Codex texts, especially in low-resourced countries, which underscores the pivotal role played by the Codex Alimentarius Commission in providing guidance to countries on the proper regulation of foods, including [the appropriate labeling of] foods for infants and young children (WHA resolution 58.32). Since 49% of all products were imported from European countries and the United Kingdom, (32.9% in Phnom Penh, 9.1% in Kathmandu Valley, 73.8% in Dakar Department and 46.2% in Dar es Salaam), their original labeling would likely have complied with regulations from the country of origin.

Age-related recommendations should support optimal IYCF

International guidance recommends exclusive breastfeeding for the first six months of life and the introduction of complementary foods from six months of age together with continued breastfeeding to 2 years of age and beyond (PAHO/WHO, 2003; WHO, 2003), and labels can support this by providing an appropriate age of introduction. It is concerning that 13.6-38.6% of CPCF labels in the four sites failed to provide an appropriate age recommendation in text, by either not providing an age recommendation or by recommending an age of introduction of less than six months. A possible explanation for the labels promoting the early use of CPCF is that almost half (49%) of all

products from all 4 sites were imported from Europe and the United Kingdom, where the European Food Safety Authority (EFSA) declared that ‘the introduction of complementary food into the diet of healthy term infants in the EU between the age of four and six months is safe and does not pose a risk for adverse health effects’ (EFSA, 2009). This divergence of opinions (WHO versus EFSA) and regulatory requirements (EU countries versus low and middle income countries), poses a challenge in a world where global trade is increasing and national law enforcement in many low and middle income countries is weak. This finding highlights the need for greater global harmonization of regulations pertaining to foods for infants and young children. As a demonstration of their support of optimal IYCF at the global level, manufacturers, especially those exporting products to a number of countries, should label all CPCF with an age of introduction from six months or later (Quinn et al. 2010).

Furthermore, product labels may encourage the early introduction of CPCF by using images of infants showing physical or developmental milestones commonly associated with infants younger than six months of age and as a result Quinn et al. (2010) suggest that only images of infants older than six months of age and showing achievement of a physical or developmental milestone clearly reached after six months should be used on CPCF. This study shows that there is a wide range between the study sites (20.0-92.3%) of labels that fail to use an appropriate image.

In Nepal, Cambodia and Tanzania images of infants/young children, regardless of whether they depict an infant/child over 6 months of age, are a violation of the national regulation, which only permits images illustrating preparation methods on foods for infants up to 12 months of age in Nepal, for children up to 2 years in Cambodia and for children up to 5 years in Tanzania (Government of Nepal, 1992; Kingdom of Cambodia, 2005; Ministry of Health and Social Welfare, 2013). As 22.7% of CPCF in Kathmandu Valley, 37.1% in Phnom Penh and 38.5% in Dar es Salaam violated this law it is further evidence of the need for countries to strengthen law enforcement of existing regulations.

Product labels should support optimal IYCF messaging

Labels can inform on IYCF practices; educational messages should support optimal IYCF - defined as ‘exclusive breastfeeding from birth for the first six months of life (180 days) and starting from six months of age, feeding safe and appropriate complementary foods, along with continued breastfeeding for up to two years of age or beyond’ (WHO, 2003). In this study only 3.6-27.3% of labels were found to provide accurate and complete messages

encouraging exclusive breastfeeding and almost none (0.0-2.9%) provided accurate and complete messages regarding the appropriate introduction of complementary foods together with continued breastfeeding. 'Breastfeeding should continue as long as possible', found on over a quarter of CPCF in Kathmandu Valley and Dar es Salaam, is incomplete and thus misleading and may undermine maternal confidence in the ability to continue breastfeeding, previously shown to be significantly related to breastfeeding duration and level (Blyth et al., 2002).

As BMS directly competes with breastmilk in the infant's diet, the Code requires BMS labels to carry a 'statement of the superiority of breastfeeding' (WHO, 1981). It appears that in an effort to apply the principles of the Code to the labeling of CPCF, manufacturers of more than two-thirds of CPCF in Kathmandu Valley included this, or a similar, message 'Mother's milk is best for your baby'. As infants from six months of age require complementary foods in addition to breastmilk, this message is insufficient if used alone on complementary food labels as it implies that breastmilk is all that is required and is preferable to complementary foods. Such messaging may have negative consequences in a country such as Nepal where the late introduction of complementary foods is a concern (MOHP, 2012). Also, more than half of CPCF labels in Kathmandu Valley used the term 'weaning', which can be interpreted as 'the complete cessation of breastfeeding' (Canadian Paediatric Society, 2004) and its use can infer that the product is suitable as a replacement for breastmilk.

Cross-promotion and invitations to interact undermine optimal IYCF

Breastmilk substitutes (BMS), both under the Code and legislation in Cambodia (unless given specific Ministry of Health approval), Nepal, and Tanzania may not be promoted directly to the consumer, yet 41.2-78.0% of CPCF sold by companies that also sell BMS, were labeled in a way that potentially also promoted the company's formula products by using the same or similar brand names or logos, colour schemes or designs, slogans, mascots or symbols. Following the voluntary adoption of the Code in Australia and consequent restrictions on the promotion of infant formula (IF), manufacturers have increased their advertising of follow-up formula (FUF), growing-up milk (GUM) and CPCF and brand-focused promotion to consumers (Smith and Blake, 2013). Cross-promotion (or 'brand cross-over promotion', 'brand-stretching' or 'line extension' (Berry et al., 2011) uses one product to advertise another (Cambridge Dictionaries Online, 2014).

When presented with a product, which is an extension of a known brand, the manufacturer's shared use of the brand's attributes (colour, name, design, etc.) through the product range, has been shown to result in the consumer

taking into account what they know about the one product, and applying that knowledge to the new product under the same brand, thus building brand loyalty (Park et al., 1991). Advertising of FUF, GUM and CPCF products, which share brand attributes with IF, could result in the de-facto promotion of the company's IF and thus circumvent the Code and national regulations (Berry et al., 2010; Berry et al., 2012). Therefore Australian researchers recommend passing legislation that prohibits the advertising of all products sharing a brand identity with IF (Berry et al., 2010), a view shared by others (Quinn, et al., 2010; WHO, 2013).

A related practice was noted, in the form of invitations to interact from manufacturers of CPCF who also sell BMS. This is often in the form of an invitation to join a baby club/to 'contact our nutrition experts'/website address/Quick Response (QR) codes, which is both a violation of the Code, which states in Article 5.5 that BMS manufacturers' marketing personnel should not seek indirect contact of any kind with pregnant women or with mothers of infants and young children, and contrary to global guidance (WHO, 1981; Quinn et al, 2010).

Appropriate preparation and use instructions are important

The recommendation (either as text or images) to feed a CPCF from a bottle undermines both optimal breastfeeding and complementary feeding. Global guidance asserts that labels should not imply that complementary foods can be used as a BMS, and considers it best practice for labels to discourage their use in liquid form (PAHO, 2003; Quinn, et al., 2010). Bottle feeding of CPCF could result in the displacement of breastmilk and lead to dilution of the complementary food (Sweet, 2012). In addition, the use of bottles poses a contamination risk in settings with poor sanitation (Dewey & Brown, 2003) and one of the leading causes of diarrhoea in children is microbial contamination of food (PAHO, 2003). Just over 21% of CPCF labels in Dakar Department and almost 12% in Phnom Penh included an image of a feeding bottle or recommended feeding the product in a bottle. This practice was not seen in Kathmandu Valley, likely a result of importing products from India (55% of imported products - data not shown), a country with strict regulations and enforcement pertaining to foods for IYCF, illustrating the potential for legal frameworks to positively affect labeling practices.

Some labels (17.0-53.0% of relevant products) recommended (text or image) feeding products with a spoon and a small number of labels (2.0-12.0% of relevant products) recommended feeding products in a soft or semi-soft form. These positive labeling practices assist with promoting the best practice recommendation that CPCF cereals and porridges be fed in a soft or semi-soft form rather than liquid form and should be encouraged (Quinn et al. 2010).

Storage Instructions and warnings are critical for products targeted at the most vulnerable

All food products should provide applicable storage instructions and warnings, especially when these products are targeted at the most vulnerable, as is the case with infants and young children (CODEX CAC/GL 8-1991)

What images are appropriate on foods for IYC?

All CPCF in the sample used images other than those displaying preparation and use of the product, with images of the product ingredients or composition being the most common. Such images, provided they are not misleading (such as images of whole foods to represent a flavorant), may be useful to the consumer when selecting a CPCF, especially in low-literacy settings. Guidance on the appropriate use of images on CPCF is limited; discussion regarding what can be considered appropriate/inappropriate and development of international guidance would be valuable both to support national governments in developing legislation and in encouraging global harmonization. More research is also needed regarding the messages images communicate to mothers/caregivers. In Laos, almost half of adults surveyed, believed that, a coffee creamer, with a logo depicting a cartoon baby bear held by its mother in the breastfeeding position, was 'good for infants' or 'a replacement for breastmilk', despite a warning to the contrary and an image of a bottle with a cross through it (Barennes et al. 2008). This picture-text incongruence highlights that images should be aligned with the text in order to assist consumers in correctly comprehending relevant messages, and should not contradict global guidance on optimal IYCF. This is especially important for low-literacy consumers who rely heavily on pictorial information when making purchasing decisions (Jae & Delvecchio, 2004; Jae et al. 2008).

Daily ration and serving sizes should not displace breastmilk or other appropriate foods

Two key challenges to achieving optimal IYCF during the complementary feeding phase are ensuring adequate nutrient content of foods and maintaining breastfeeding up to the age of 24 months and beyond. CPCF labels should recommend daily rations and serving sizes that provide energy within the daily requirements for breastfed children since excessive consumption could result in the displacement of continued breastfeeding as well as other locally available and appropriate foods (WHO 2015; Quinn et al. 2010). Few CPCF products provided a daily ration (0.0-8.6%) and between 14.5-55.6% of products' daily rations (indicated as suitable for children 6 to 8.9 months) exceeded the daily energy recommendation for complementary foods for a breastfed child (PAHO/WHO, 2003). Of concern was that just over a third (36%) of labels that recommended a single serving size (for 6-8.9 month olds) exceeded the WHO guidelines (data not shown). Furthermore, over half (50.0-70.0%) of CPCF cereal labels, that included a daily ration, exceeded the recommended daily energy intake for complementary foods for a breastfed

child (data not shown), raising concerns about portion sizes recommended by CPCF manufacturers', especially in the light of the burgeoning double burden of under- and over-nutrition in low and middle income countries (Ng et al. 2014).

Guidance on nutrition and health claims should not lead to unintended negative consequences

Whether nutrition and health claims are appropriate on food labels for infants and young children is currently under discussion at the World Health Assembly (WHA). WHA resolution 63.23 in 2010 urged member states *“to end inappropriate promotion of food for infants and young children and to ensure that nutrition and health claims shall not be permitted for foods for infants and young children, except where specifically provided for, in relevant Codex Alimentarius standards or national legislation”* (WHA, 2010). Subsequently in 2012, WHA resolution 65.5 requested that the Director-General *“provide clarification and guidance on the inappropriate promotion of foods for infants and young children cited in resolution WHA63.23, taking into consideration the ongoing work of the Codex Alimentarius Commission”* (WHA, 2012).

This study shows, that nutrition/health claims are made on 85.7-95.5% of CPCFs in Kathmandu Valley, Dakar Department and Dar es Salaam and that nutrient function/other function/implicit health claims and nutrient content claims are the most common of these claims. Although a complete ban of nutrition and health claims on CPCF would put an end to misleading and unsubstantiated claims, however, there could be a number of unintended negative consequences. These include limiting the consumers' ability to identify and select a fortified CPCF over a non-fortified CPCF and mothers/caregivers selecting poor quality (yet cheaper) commercially-produced foods not marketed for, but commonly fed to children less than two years over appropriately formulated CPCF. The findings of this study highlight the need for further research to determine whether these concerns are valid and the importance of the current work of the WHO in providing guidance.

CONCLUSIONS

Labeling practices of CPCF included in this study do not fully comply with international guidance and national legislation on the promotion of CPCF and so do not sufficiently protect and promote optimal IYCF practices. Inappropriate practices that were particularly prevalent included the language used, lack of accurate and complete IYCF messages, lack of appropriate age of introduction, recommended portion sizes and daily rations in excess of the daily requirements for breastfed children, and cross promotion between CPCF and BMS produced by the same manufacturer. Such practices have the potential to undermine public health messages regarding optimal breastfeeding and the timely introduction of complementary foods, and to displace continued breastfeeding and other locally available and appropriate foods. In addition, nutrition and health claims were common and many images on CPCF were considered to be potentially misleading. Corporations that manufacture any food or beverage for infants and young children can - and do - influence their feeding, and therefore need to take greater responsibility to protect and promote optimal infant and young child feeding practices.

RECOMMENDATIONS

There is a need for clarification and detailed guidance from normative bodies on a wide range of practices pertaining to the labeling and inappropriate promotion of CPCF, to assist governments in setting relevant regulations and prohibiting manufacturers of CPCF and BMS from undertaking any form of cross promotion between these products. The work of the World Health Organisation Scientific and Technical Advisory Group, in providing clarification and guidance, will be valuable (WHO, 2015). All manufacturers, especially multinational companies, manufacturing CPCF products must take greater responsibility for monitoring the labeling, distribution and sale (directly or indirectly) of their products, to ensure that they do not violate the national regulations in the country of sale. This is especially important when products are imported from one country to another with stricter regulations. In addition, manufacturers should comply with global normative guidance as a minimum standard when national regulations are absent. Review and revision of legislation regulating the labeling of CPCF in Cambodia, Nepal, Senegal and Tanzania, to ensure it is specific and comprehensive, is necessary. Equally important is the need for improved monitoring and enforcement of regulations in the four countries. Further research is required regarding a number of label elements including IYCF messages and images carried on foods for IYCF, to determine understanding and the extent to which they influence, either positively or negatively, a mother/caregivers choice of foods available to feed her child.

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APPENDIX 1: Store sampling methodology by study site

Study site	Administrative divisions (AD)		No. of AU randomly sampled (% of total)	No. small stores visited per randomly sampled AU (corner/convenience; small grocery/neighborhood; independent pharmacy)	No. large stores purposively sampled per study site (supermarket/grocery stores, baby stores; pharmacies)	Total no. stores sampled
	1st level	No. of administrative units (AU) per 1 st level AD				
Senegal: Dakar Department	Borough:	Borough communes:		1 corner store and 1 neighborhood store per borough commune; 1 independent pharmacy for every 2 borough communes (max. 4)		
	1. Almadies	4	2			
	2. Dakar-Plateau	4 ^a	2			
	3. Grand-Dakar	6	3			
	4. Parcelles Assainies Total:	4 18	2 9 (50%)	22 (9;9;4)	9 (6;0;3)	31
Nepal: Kathmandu Valley	Urban municipality ^b :	Wards:		2 stores per ward: 1 independent pharmacy for every 2 wards (max. 5); 1-2 corner stores per ward		
	1. Kathmandu Metropolitan City	35	7			
	2. Lalitpur Sub-metropolitan City	22	4			
	Total:	57	11 (19%)	22 (17;0;5)	9 (9;0;0)	31
Cambodia: Phnom Penh	Khan:	Urban sangkat:		1 small grocery store and 1 convenience store per sangkat; 1 independent pharmacy for every 2 sangkat		
	1. Chamkar Mon	12	2			
	2. Doun Penh	11	2			
	3. Prampir Meakkakra	8	2			
	4. Tuol Kouk Total:	10 41	2 8 (20%)	18^c (7;7;4)	11 (6;4;1)	29
Tanzania: Dar es Salam	Municipal council:	Urban wards:		2 stores per ward: 1-2 convenience stores per ward; 1-2 independent pharmacies per		

	1. Ilala	7	2	municipal council			
	2. Kinondoni	19	5				
	3. Temeke	11	3				
	Total:	37	10 (27%)		20 (16;0;4)	10 (8;0;2)	30
	Grand Total:			82	39	121	

^aGorée is not included as it is an island and only borough communes that form part of the mainland are included in this study. ^bOf the 5 municipal areas in Kathmandu Valley, Bhaktapur municipality, Kirtipur municipality, and Madhyapur Thimi municipality were excluded from the study due to challenges experienced with access to stores. Although these areas are officially classified as urban, some areas are rural or very sparsely populated as well as the areas having poor road infrastructure, making it difficult to implement the study methodology with regard to store sampling. ^cOf the original 20 small stores, two were excluded because it was determined during data extraction that the products purchased at these stores did not meet the inclusion criteria for the study.

Detailed description of random sampling of smaller stores

Random sampling within administrative divisions was used to identify approximately 20 small stores at each site. For each first level administrative division, lists were obtained of the second level administrative units and a random sample of 20-50% of these administrative units was selected for inclusion (**Appendix 1, Table 1**). A list of the selected administrative units and the predetermined number and type of stores required for store visits within each administrative unit was developed. Data collectors travelled to the administrative office of each selected administrative unit. From this point, appropriate stores were located by asking an adult female passer-by where the nearest store selling IYCF products was located. If no females were present, a male was asked.

Data collectors chose a random direction to proceed on foot if there were no passers-by, until either encountering someone or until encountering the nearest appropriate store. Subsequent appropriate stores within the administrative unit were located by asking the store manager or a passer-by for directions or continuing on the randomly selected route until the predetermined number and type of stores was achieved. Data collectors entered adjacent administrative units to locate a store if this is where they were specifically directed or if the sampled administrative unit did not contain an appropriate store, but always remained within the same first-level administrative division. If a store was located that did not sell IYCF foods, it was excluded and another store sought out.