



Complementary feeding in South Asia: a multi-system analysis of the enabling environment and programme context

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Abstract

Aim The links between poor complementary feeding and child malnutrition in South Asia argue for greater attention to improving young children's diets. This study examined the status of policy and programme actions to support complementary feeding across four systems in South Asia: food, health, social protection, and water, sanitation, and hygiene (WASH).

Methods We conducted a review to assess the status of national policy and programme actions to improve complementary feeding in children aged 6–23 months in eight South Asian countries across four systems, including the comprehensiveness of the enabling environment and the geographic scale of programmes.

Results All countries have policy and programme commitments to improving complementary feeding; however, no country has a comprehensive set of legislation, policies, strategies, and plans that fully incorporate relevant global recommendations and guidance. The health system has the strongest enabling environment for complementary feeding, but the lack of supportive legislation, policies, strategies, and plans in other systems may hinder multisystem action. There are few examples of nationwide programmes to improve complementary feeding beyond the health system.

Conclusion Governments should mobilize their institutions and resources to enable a coherent and multisystem response to complementary feeding that addresses the gaps in legislation, policies, and programmes and the barriers and bottlenecks to implementation at scale, with a focus on the food, health, social protection, and WASH systems. Further operational research is needed on the factors and processes that enable multisystem action to secure nutritious, safe, affordable, and sustainable diets for young children in South Asia.

Keywords Complementary feeding · Enabling environment · South Asia · Multi-system

Background

The quality of children's diets is a major concern globally, beginning in early childhood (UNICEF 2019). Adequate diets and feeding practices during the complementary feeding period (6 to 23 months) ensure young children consume sufficient protein, fats, energy, and micronutrients to fuel rapid growth and compensate for nutrient losses due to disease. In addition, they may help establish healthy lifelong food preferences and habits (UNICEF 2020a).

In South Asia, one in two children under 5 years are either wasted, overweight, and/or stunted (UNICEF 2019). There is growing evidence from the region that diets low in diversity or meal frequency are linked with an increased risk of wasting and stunting in children aged 6–23 months (Harding et al. 2018; Kim et al. 2017). This is of immense concern because complementary feeding practices are very poor; only 12% of children aged 6–23 months have a minimum acceptable diet; that is, they receive a minimum diversified diet and minimum meal frequency (UNICEF 2020b). Studies conducted in the region also show that a high proportion of children aged 6–23 months consume unhealthy processed foods and beverages (Pries et al. 2017, 2019).

Governments have the responsibility to take adequate measures to combat malnutrition as part of their legal obligation to respect, protect, and fulfil children's rights. These measures include policies and legislation to enable infants and young children to access and consume nutritious, safe,

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affordable, and sustainable diets during the complementary feeding period (UNICEF 2020a). The policies and legislation, together with corresponding strategies, plans, budgets, coordination structures, and monitoring mechanisms, help create the conditions for the ‘enabling environment’ (Gillespie et al. 2013) to improve complementary feeding. This enabling environment should encompass the multiple systems that influence complementary feeding, including the food, health, social protection, and water, sanitation, and hygiene (WASH) systems (UNICEF 2020a). In addition, it should ensure that there is adequate coherency and coordination between the actions of each system.

The growing global attention on malnutrition has spurred governments in South Asian countries to strengthen the enabling environment for nutrition and to introduce and scale-up nutrition programmes (Development Initiatives 2020). The extent to which these countries have policy and programme measures to protect, promote and support complementary feeding has not been comprehensively explored. This study was designed to examine (i) the status of the enabling environment to support complementary feeding in South Asian countries across the food, health, social protection, and WASH systems, and (ii) the geographic scale of programmes, services, and interventions to improve complementary feeding.

Methods

We conducted a review of policy and programme actions to improve complementary feeding in children aged 6–23 months in South Asian countries (Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka).

We developed an online structured country questionnaire in English using Office Forms to gather data and information on each country [see Supplementary Material 1]. The questionnaire was organized into five components: multi-sector governance, food system, health system, social protection system, and WASH system. For each component, a set of indicators was developed to assess (i) the comprehensiveness of the enabling environment for complementary feeding, including the status of policies, strategies, plans, legislation, standards, guidelines, coordination structures, information systems, and frontline worker roles, and (ii) the geographic scale of programmes, services, and interventions. The indicators were derived from recommendations and guidance in global strategies, guiding principles, and other programme documents on complementary feeding (PAHO/WHO 2003; UNICEF 2011; WHO 2005, 2016; WHO and UNICEF 2003) and population-based approaches to improve diets (WHO 2010; WHO and FAO 2006).

The review was conducted in July and August 2019 using a range of approaches including a desk review of national policy and programme documents, and key informant interviews and group consultations with country-level stakeholders. The key informants and stakeholders (range two to 25 individuals per country) included technical staff from government ministries, United Nations agencies, and non-government organizations (range two to eight organizations per country). The status of the enabling environment was rated using the following scale: ‘comprehensive’, covers all or most globally recommended content; ‘partial’, exists but there are significant gaps in content; and ‘missing’, does not exist. The geographic scale of programmes, services, and interventions was categorized qualitatively as ‘nationwide scale up’, ‘scale up in selected areas’, ‘pilot initiatives’, or ‘no programme’.

We also extracted data and information from existing global analyses (WHO 2018, 2020) on the status of legal provisions to protect complementary feeding in each South Asian country, including the marketing of breastmilk substitutes and complementary foods.

Results

Enabling environment

Table 1 shows the status of multi-sector governance and the enabling environment to improve complementary feeding in South Asia across the food, health, social protection, and WASH systems.

Multi-sector governance

Only Nepal was rated comprehensive for all five indicators on multi-sector governance. All countries have a multi-sector nutrition policy, strategy, and/or plan that includes interventions to improve complementary feeding; however, they are considered comprehensive in only four countries (India, Nepal, Pakistan, and Sri Lanka). In all countries except Afghanistan, these policies, strategies, or plans include at least one quantitative target to assess progress in improving complementary feeding, albeit there is scope to strengthen the targets in both Bangladesh and India. A national social and behaviour change communication strategy to improve complementary feeding is in place in all countries except Sri Lanka, but the strategies have notable gaps in Bangladesh and Bhutan.

All countries have a multi-sector coordination structure that is mandated to coordinate the national response to improve complementary feeding, and they are considered comprehensive in all but the Maldives. Six countries (all except Bhutan and the Maldives) also have structures at

Table 1 Status of the enabling environment to improve complementary feeding in South Asia

	AFH	BDG	BTN	IND	MDV	NPL	PAK	LKA
MULTISECTOR GOVERNANCE								
Multi-sector policy, strategy or plan to improve CF	P	P	P	C	P	C	C	C
Multi-sector policy, strategy or plan to improve CF includes at least one quantitative target on a CF practice	M	P	C	P	C	C	C	C
National social and behaviour change communication (SBCC) strategy to improve CF	C	P	P	C	C	C	C	M
National level multi-sector coordination structure for coordination of the national response to improve CF	C	C	C	C	P	C	C	C
Sub-national multisector coordination structures for coordination of the sub-national response to improve CF	P	P	M	P	M	C	P	P
FOOD								
Agriculture and food security policies, strategies or plans include the intent to improve CF	M	P	C	P	M	C	P	M
National policies to reduce the impact on children of marketing of foods and beverages high in fats, sugars, or salt	M	P	P	P	P	P	P	C
Mandatory legislation for salt iodization	C	C	C	C	M	C	P	C
Mandatory legislation for vitamin A fortification of a food vehicle	C	C	M	P	M	C	C	M
Mandatory legislation for iron fortification of a food vehicle	P	C	M	P	M	C	P	M
National food-based dietary guidelines that include age-specific recommendations for children aged 6–23 months	P	P	M	C	M	C	P	M
National standards for complementary foods	M	M	M	C	C	M	M	C
Codex Alimentarius standards for complementary foods (or equivalent national standards) are implemented	M	P	M	C	M	M	P	C
Job descriptions of agriculture extension workers include supporting or promoting CF	P	P	M	M	M	M	M	P
Pre-service training of agriculture extension workers includes CF	C	M	P	M	M	M	M	P
In-service training of agriculture extension workers includes CF	C	M	M	M	M	M	M	P
HEALTH								
Health policies, strategies, or plans include the intent to improve CF	C	C	C	C	P	P	C	C
CF included in the minimum package of services for health facilities in national health policy	C	C	C	C	P	M	P	C
Indicator on infant and young child feeding counselling included in the HMIS or other routine information system	C	C	C	P	M	C	C	M
CF data from HMIS (or other routine information system) is monitored on a regular basis with standard procedures	M	P	P	P	M	C	P	M
Job descriptions of health facility workers include promoting, supporting, or counselling on CF	C	P	C	C	P	P	C	P
Job descriptions of community health workers include promoting, supporting, or counselling on CF	C	P	C	C	P	P	C	P
Pre-service training of health facility workers includes CF	P	P	C	C	P	C	P	C
Pre-service training of community health workers includes CF	C	P	C	C	P	C	C	C
In-service training of health facility workers includes CF	C	C	C	C	P	C	C	C
In-service training of community health workers includes CF	C	P	C	C	P	C	C	C
Health facility workers are given supportive supervision on CF	C	P	C	P	M	C	P	C
Community health workers are given supportive supervision on CF	C	P	C	P	M	C	P	C
SOCIAL PROTECTION								
Social protection policies or strategies include intent to improve CF	M	M	P	C	M	C	P	M
Multi-sector policy or strategy to improve CF includes social protection services	P	M	P	C	M	C	M	C
Maternity protection law to protect breastfeeding	P	P	P	P	P	C	P	C
WASH SYSTEM								
Nutrition policies, strategies or plans include actions to improve water supply, sanitation, and hygiene	P	P	C	C	P	C	P	M
Nutrition policies, strategies or plans include actions to ensure safe food hygiene, preparation, and storage.	P	P	P	C	P	C	C	M
Nutrition policies, strategies or plans include actions to ensure safe preparation and storage of complementary foods	M	M	P	C	P	C	C	M
National SBCC strategy or plan that promotes safe hygiene practices, including during preparation and feeding of complementary foods	M	P	P	C	P	C	C	M

CF=complementary feeding; HMIS=Health Management Information System; AFG=Afghanistan; BDG=Bangladesh; BTN=Bhutan; IND=India; MDV=The Maldives; NPL=Nepal; PAK=Pakistan; LKA=Sri Lanka; C=comprehensive (covers all or most globally recommended content); P=partial (exists but there are significant gaps in content); and M=missing (does not exist)

sub-national level; however, these structures are only comprehensive in Nepal, indicating that coordination structures are weaker at subnational level than they are at national level.

Food system

Five countries have an agriculture and food security policy, strategy, or plan that includes measures to improve complementary feeding; however, they are comprehensive in only Bhutan and Nepal.

Continued breastfeeding from 6 months to at least 2 years of age is a component of adequate diets for young children during the complementary feeding period (UNICEF 2020a, b). Countries in South Asia have made significant efforts to enact legal measures to protect breastfeeding, which provides an important source of nutrients throughout the complementary feeding period. All countries have enacted some provisions of the International Code of Breastmilk Substitutes and subsequent World Health Assembly resolutions (WHO 2018, 2020) except Bhutan, which is in the process of developing legislation. The legal measures cover breastmilk substitutes for children up to only 12 months in Nepal, Pakistan, and Sri Lanka (less than the recommended period of continued breastfeeding, i.e., up to 24 months and beyond), up to 24 months in India, and at least 36 months in Bangladesh and the Maldives; the legislation in Afghanistan does not specify the period.

There is scope to improve the legal measures to protect against inappropriate marketing of complementary foods. Table 2 shows that these legal measures cover complementary foods for children up to age 12 months in four countries (Maldives, Nepal, Pakistan, and Sri Lanka) and therefore do not cover the full period of complementary feeding. Analysis of the legal requirements for labelling of processed complementary foods found that only two countries (Afghanistan and Maldives) require a message on the importance of not introducing complementary foods before 6 months, and only four countries (Afghanistan, Bangladesh, Maldives, and Pakistan) require a message on the importance of continued breastfeeding for up to 2 years or beyond. Three countries (Afghanistan, Bangladesh, and Nepal) prohibit any image or text that suggests the complementary food is suitable for infants under the age of 6 months, and only Sri Lanka bans the promotion of complementary foods before 6 months. The number of relevant provisions to protect against conflicts of interest by complementary food manufacturers and distributors in health care settings and by health workers, systems, professional associations, and NGOs ranges from three in Nepal to eight in Afghanistan and Pakistan, out of a maximum nine.

On broader measures to protect children's diets, only Sri Lanka reported that it has comprehensive policies to

reduce the impact on children of marketing of foods and non-alcoholic beverages high in saturated fats, trans-fatty acids, free sugars, or salt. Comprehensive mandatory legislation on food fortification is in place in six countries for salt iodization (all except Maldives and Pakistan), four countries for vitamin A fortification (Afghanistan, Bangladesh, Nepal, and Pakistan), and two countries for iron fortification (Bangladesh and Nepal). There is no mandatory legislation for fortification with iodine, vitamin A or iron in the Maldives; however, all imported salt for human consumption is iodized.

Five countries (Afghanistan, Bangladesh, India, Nepal, and Sri Lanka) have food-based dietary guidelines that include age-specific recommendations for children aged 6–23 months, but these guidelines are not considered comprehensive in Afghanistan and Bangladesh. Three countries (India, Maldives, and Sri Lanka) have national standards for complementary foods that are rated comprehensive. India and Sri Lanka are also comprehensively implementing the Codex Alimentarius standards for complementary foods.

Complementary feeding is not well integrated into the job descriptions or training of agricultural extension workers, except in Afghanistan, where the job descriptions partially include a role in supporting or promoting complementary feeding, and both pre-service and in-service training comprehensively includes complementary feeding.

Health system

Every country in the region has a health policy, strategy, or plan that includes the intent to improve complementary feeding, but the Maldives and Nepal reported gaps in the comprehensiveness of these documents. Complementary feeding is included in the minimum package of services for health facilities in the national health policy in all countries except Nepal; however, only partially in the Maldives and Pakistan. The health management information systems or other routine information systems include an indicator on the counselling of caregivers of children 6–23 months on infant and young child feeding in six countries (all except Maldives and Sri Lanka), but only partially in India. Data on complementary feeding is monitored comprehensively on a regular basis in Nepal only.

Only Bhutan has comprehensive status for all indicators on roles, training, and supervision of health facility workers and community health workers (CHW). Four countries (Afghanistan, Bhutan, India, and Pakistan) have comprehensively included responsibilities to promote, support, or counsel on complementary feeding in the job descriptions of both health facility workers and CHW; elsewhere, the job descriptions of these workers partially describe these responsibilities. All countries have included complementary feeding into the pre-service and in-service training of

Table 2 Status of legal provisions related to complementary foods in South Asia (WHO 2018, 2020)

	AFG	BDG	IND	MDV	NPL	PAK	LKA	Source
Scope of the code								
Breastmilk substitutes products covered to up age (months)	Unspecified	60	24	36	12	12	12	WHO 2020
CF covered up to age (months)	30	60	24	12	12	12	12	WHO 2018
Provisions on labelling of CF								
Importance of not introducing CF before 6 months	✓	x	x	✓	x	x	x	WHO 2018
Importance of continued breastfeeding for up to 2 years or beyond	✓	✓	x	✓	x	✓	x	WHO 2018
Prohibition of any image or text that might suggest use for infants under the age of 6 months	✓	✓	x	x	✓	x	x	WHO 2018
Prohibition of any image or text that might undermine or discourage breastfeeding	✓	x	✓	x	✓	✓	x	WHO 2018
Does not convey endorsement by professional or other body unless approved by relevant authority	x	x	x	x	x	x	x	WHO 2018
Promotion of CF								
Ban on promotion of CF before 6 months	x	x	x	x	x	x	✓	WHO 2018
Ban of any form of promotion of CF	✓	x	x	✓	✓	✓	x	WHO 2018
Ban on cross promotion	x	x	x	✓	x	x	x	WHO 2020
Avoidance of conflict of interest by CF manufacturers and distributors in health care settings								
Prohibition of sponsorships of meetings by manufacturers and distributors of CF	✓	✓	✓	✓	x	✓	✓	WHO 2018
Prohibition of free products, samples, or reduced-price foods through health workers/facilities	✓	✓	✓	✓	✓	✓	✓	WHO 2018
Prohibition on donation or distribution of equipment or services to health facilities	✓	x	x	✓	x	✓	x	WHO 2018
Prohibition of gifts or incentives to health care staff	✓	✓	✓	✓	✓	✓	✓	WHO 2018
Prohibition of use of health facilities to host events, contests, or campaigns	✓	✓	x	x	x	x	x	WHO 2018
Prohibition of gifts or coupons to parents, caregivers, and families	✓	✓	x	x	x	✓	✓	WHO 2018
Prohibition of direct or indirect provision of education to parents/caregivers in health facilities	✓	✓	x	x	x	✓	*	WHO 2018
Prohibition on provision of information for health workers which is not scientific and factual	✓	x	✓	✓	✓	✓	x	WHO 2018
Avoidance of conflict of interest by health workers/systems/professional associations and NGOs								
Avoidance of conflict of interest by health workers/systems/professional associations and NGOs	x	x	x	x	x	✓	x	WHO 2018

CF=complementary food; AFG=Afghanistan; BDG=Bangladesh; IND=India; MDV=The Maldives; NPL=Nepal; PAK=Pakistan; LKA=Sri Lanka. Bhutan is not included because it has no legal provisions

health facility workers and CHW. However, this has been done comprehensively for seven countries for in-service training (all except Maldives) and only four countries for pre-service training (Bhutan, India, Nepal, and Sri Lanka). There are also significant gaps in supportive supervision of health facility workers and CHW on complementary feeding, with four countries (Afghanistan, Bhutan, Nepal, and Sri Lanka) reporting comprehensive status.

Social protection system

Four countries have social protection policies or strategies that include the intent to improve complementary feeding, but they are comprehensive in only India and Nepal. Social

protection services are included in the multisector policies or strategies to improve complementary feeding in five countries (Afghanistan, Bhutan, India, Nepal, Sri Lanka). All countries have maternity protection laws, but they comprehensively address maternity leave and benefits as well as entitlements to breastfeeding breaks in only Nepal and Sri Lanka.

WASH system

Five countries (Bhutan, India, Maldives, Nepal, and Pakistan) have both (1) nutrition policies, strategies, or plans that include an intent to improve water supply, sanitation and hygiene, including through the safe preparation and storage

of complementary foods, and (2) a social and behaviour change communication strategy or plan that promotes safe hygiene practices, including during the preparation and feeding of complementary foods. However, these components are fully comprehensive for all elements in only India and Nepal. One or more of these elements are missing in nutrition policies, strategies, and plans in Afghanistan, Bangladesh and Sri Lanka.

Geographic scale of programmes, services and interventions

Table 3 shows the geographic scale of programmes, services and interventions to improve complementary feed in South Asian countries by system.

Food system

All countries have initiatives to increase access to and use of local nutritious foods at household level, but these initiatives are at nationwide scale in India and Sri Lanka only. Very few countries socially market fortified complementary foods (pilot initiatives in Nepal and Pakistan only) or micronutrient powders (nationwide in Sri Lanka in selected geographic areas in Nepal, and pilot initiatives in Bangladesh), which are important approaches to improve the micronutrient intake of young children.

Health system

Five countries are implementing nationwide programmes to deliver individual and group education and counselling on complementary feeding at both facility and community

Table 3 Geographic scale of programmes, services and interventions to improve complementary feeding in South Asia by system

	AFH	BGD	BTN	IND	MDV	NPL	PAK	LKA
FOOD								
Initiatives to increase access to and use of diverse, local nutritious foods at the household level	S	P	S	N	P	S	S	N
Social marketing of fortified complementary foods	M	M	M	M	M	P	P	M
Social marketing of micronutrient powders	M	P	M	M	M	S	M	N
HEALTH								
Individual counselling of caregivers on complementary feeding at relevant MNCH contacts at facility level	N	S	N	N	S	N	S	N
Individual counselling of caregivers on complementary feeding at relevant MNCH contacts at community level	N	S	N	N	P	N	N	N
Group education of caregivers on complementary feeding at relevant MNCH contacts at facility level	N	S	N	N	P	N	S	N
Group education of caregivers on complementary feeding at relevant MNCH contacts at community level	N	S	N	N	M	N	N	N
Counselling and/or nutrition education promote responsive parenting, responsive feeding, and early stimulation	M	P	N	N	P	S	S	N
Use of community mobilisation approaches to promote complementary feeding	N	S	M	N	P	N	S	N
Use of mass media and/or social media to promote complementary feeding	M	S	N	N	N	N	N	N
Provision of micronutrient powders	M	S	N	M	M	S	S	N
Provision of lipid-based nutrient supplements	S	M	M	M	M	M	S	M
Provision of fortified complementary foods	M	M	M	N	M	S	M	M
SOCIAL PROTECTION								
Social protection services for improved early childhood nutrition (cash or in-kind transfers combined with nutrition counselling)	M	P	N	N	M	S	P	N
Subsidies that promote affordability of nutritious foods among low-income parents with young children	M	M	N	N	M	M	M	N
Nutrition–social protection integration initiatives with explicit intent to improve complementary feeding	M	M	N	N	M	M	P	M
WASH								
National nutrition–WASH integration initiatives with explicit intent to improve complementary feeding	S	P	P	N	M	M	S	S

MNCH = maternal, newborn, and child health; AFH = Afghanistan; BGD = Bangladesh; IND = India; MDV = The Maldives; NPL = Nepal; PAK = Pakistan; LKA = Sri Lanka; N = nationwide scale up; S = scale up in selected areas; P = pilot initiatives; N = no programme

levels (Afghanistan, Bhutan, India, Nepal, and Sri Lanka). These nationwide programmes include responsive feeding and early stimulation in Bhutan, India, and Sri Lanka, and involve community mobilization in Afghanistan, India, Nepal, and Sri Lanka. In Pakistan, there are nationwide programmes for individual and group education and counselling at community level, however, only in selected areas at facility level. In Bangladesh, all counseling services are in selected areas only. In the Maldives, individual counselling is available at health facility level in selected areas, and there are ongoing pilots to introduce individual counselling at community level and group education at facility level. All countries except Afghanistan use mass media to promote complementary feeding, which is encouraging. Very few countries have nationwide scale-up through the healthy system of micronutrient powders (Bhutan and Sri Lanka only), lipid-based nutrient supplements (only selected areas for Afghanistan and Pakistan) or fortified complementary foods (India).

Social protection system

Bhutan, India, and Sri Lanka have nationwide social protection services to improve early childhood nutrition and subsidies that promote affordability of nutritious foods among low-income parents with young children. Bhutan and India also have nationwide programmes to integrate nutrition and social protection interventions with the explicit intention to improve the complementary feeding of children 6–23 months. Elsewhere, these programmes are largely missing, although Bangladesh, Nepal, and Pakistan have some components that are either in selected areas or being piloted.

WASH system

Initiatives to integrate nutrition and WASH services and interventions to improve complementary feeding are being implemented nationwide in India, in selected areas in Afghanistan, Pakistan, and Sri Lanka, and on a pilot basis in Bangladesh and Bhutan.

Discussion

This study examined the extent to which countries in South Asia have an enabling environment and programmes to improve complementary feeding across the food, health, social protection and WASH systems. There are signs of policy and programme commitments to improving complementary foods in all countries; however, substantial gaps exist. No country has a comprehensive set of legislation, policies, strategies, and plans that fully incorporate

relevant global recommendations and guidance. The health system has the strongest enabling environment, but missed opportunities within other systems may hinder multisystem action. Children remain vulnerable to inappropriate marketing of complementary foods, unhealthy foods, and beverages due to the lack of robust legal measures. Government institutions and resources have not yet been adequately mobilized to translate the political commitment expressed in legislation and policies to programmes and services for children and their caregivers. In fact, there are few examples of nationwide programmes and services outside the health system.

Multi-sector governance

In many low- and middle-income countries, multi-sector nutrition policies, strategies, and plans are used to guide national efforts to achieve national and global targets on nutrition. All countries in South Asia have a multi-sector nutrition policy, strategy, or plan, but they include a comprehensive set of actions to improve complementary feeding in only three countries (India, Nepal, and Sri Lanka) and targets to improve at least one complementary feeding practice in only five countries. The reasons for the limited attention to complementary feeding could reflect the reliance on health system actions to improve dietary practices among young children and insufficient recognition or understanding on the need to engage multiple sectors or systems. A previous study found that the policy landscape for complementary feeding in South Asia is weaker than for breastfeeding and lacks clarity on the approaches and interventions needed among different sectors (Throw et al. 2017). Despite these gaps, five countries in South Asia have a national social behaviour change strategy that includes comprehensive actions on complementary feeding, a sign that there has been a country focus on addressing the social and behavioural determinants of young children's diets.

All countries have multi-sector coordination structures to oversee the national response to complementary feeding, and they are considered comprehensive in all but the Maldives. These structures may focus on nutrition or be specific to infant and young child feeding. Examples from countries in the region include the Afghanistan National Food Security and Nutrition Agenda platform in Afghanistan, the Alliance on Infant and Young Child Feeding in Bangladesh, the Prime Minister's Overarching Scheme for Holistic Nourishment Abhiyaan in India, and the Nutrition Technical Committee in Nepal. However, these structures have not been adequately decentralized, except in Nepal, where there are Nutrition and Food Security Steering Committees at provincial, local government, and ward level (National Planning Commission 2017).

Food system

The food system can make it easier — or harder — for families to make nutritious choices for their young children by influencing what and how food is produced, stored, processed, distributed, and marketed. The government has a key role in enacting and implementing policies and legal measures that encourage the production of diverse nutritious foods, ensure food safety and quality, mandate fortification and food processing techniques that add nutrient value, and protect diets from inappropriate commercial influence.

Our findings show that the agriculture and allied sectors are not yet taking adequate policy and programme actions to help meet the specific dietary needs of children in early life in most South Asian countries. The weak policy environment (e.g., six countries lack an agriculture or food security policy, strategy, or plan that includes the intent for comprehensive measures to improve complementary feeding) and lack of nationwide scale to increase the access to and use of local nutritious foods at household level except in India and Sri Lanka represent missed opportunities to influence the availability and consumption of nutritious foods in South Asia. They also belie the considerable experience in nutrition-sensitive agriculture in the region. A systematic review of evidence from South Asia found that household- or farm-level agricultural interventions increased the dietary diversity of household members and the consumption of nutritious foods, including animal-source foods and green leafy vegetables (Bird et al. 2019). Homestead food production — the household-level production of vegetables and fruits and small animal husbandry — has been successfully used in South Asia to improve diets of household members, including young children, though never at scale (Dizon et al. 2019; Haselow et al. 2016; Osei et al. 2017).

Fortification of staple foods is an underexploited opportunity, with no country having a full complement of staple foods that are fortified with iodine, vitamin A, and iron. That said, staple food fortification is designed to improve micronutrient intake in the general population and will not meet the relatively high micronutrient needs of young children (WHO and FAO 2006). Fortified commercial complementary foods can be an important source of essential nutrients for young children; however, standards for these foods only exist in India, Maldives, and Sri Lanka.

All countries are missing important legal measures to prevent the inappropriate marketing of complementary foods in health care and retail settings, and only Sri Lanka is reported to have comprehensive policies to reduce the impact on children of marketing of unhealthy foods and non-alcoholic beverages. While addressing these gaps in legislation should be a priority, legislation alone is insufficient to protect children from commercial influence unless accompanied by robust monitoring and enforcement mechanisms (WHO 2020).

Health system

The health system has traditionally played a leading role in the provision of services to educate and counsel caregivers of infants and young children on complementary feeding, hygiene practices, and other relevant childcaring practices (UNICEF 2020a). It also has a primary role in delivering dietary supplements to children, including home fortificants (micronutrient powders and lipid-based nutrient supplements), which fill micronutrient gaps in young children's diets.

Complementary feeding is more comprehensively grounded in the enabling environment of the health system in South Asia than any of the other systems examined, perhaps reflecting its longer history in delivering interventions to improve young children's diets. However, the health system gives much less attention to complementary feeding than to breastfeeding (WHO 2018; Torlesse and Raju 2018), and our review found that gaps persist, including in formalizing the roles of frontline health worker educating and counselling caregivers on complementary feeding, pre-service training, and supportive supervision, which are crucial for ensuring the quality of services (UNICEF 2020a). Studies in South Asia have found that adequately trained and supervised health workers can improve complementary feeding (Aguayo 2017; Nguyen et al. 2019). However, these studies have examined the impact of in-service training, while the gaps in South Asia are most pronounced for pre-service training.

There are also considerable gaps in the capacity of routine information systems to collect and review data on the coverage of counselling services to improve complementary feeding. Five countries in South Asia have an indicator on IYCF counselling of children aged 6–23 months in a health or nutrition information system, but only Bangladesh routinely collects and monitors this data. Improved measurement of counselling coverage by routine information systems can ensure that health managers and service providers value these services and are held to account for their delivery. It also helps inform actions to improve the coverage of programmes to support complementary feeding (Choufani et al. 2020).

We found that the health system has a greater number of nationwide programmes and services to improve complementary feeding than other systems. Most countries have nationwide coverage of counselling services on complementary feeding, including at both community and facility level in six countries. South Asia has been at the forefront of global learning on what works to improve the coverage and quality of counselling on complementary feeding through the health system. Besides the training and supportive supervision of health facility workers and CHW, studies have shown that important considerations include the use of

formative research to inform programme design; attention to the timing, frequency, duration, and location of contacts with caregivers and other influential family members, age-appropriate content of messages and counselling; and the use of multiple communication channels (Choufani et al. 2020; Avula et al. 2013; Menon et al. 2016).

The gaps in geographic coverage of home fortificants and fortified complementary foods in South Asia are greater than for education and counselling services. Only one or two countries provide micronutrient powders, lipid-based nutrient supplements, or fortified complementary foods with nationwide coverage. The provision of home fortificants not only fills shortfalls in the micronutrient intake of young children but also increases the frequency of contact between caregivers and providers for support and counselling on complementary feeding (Siekmans et al. 2017). In Nepal, the promotion of micronutrient powders is associated with the timely introduction of complementary foods, minimum dietary diversity, and minimum meal frequency (Locks et al. 2018; Mirkovic et al. 2016).

Social protection

With 37% of the world's poor children, South Asia remains the second poorest region in the world after Sub-Saharan Africa (OPHI, 2018). Improving dietary diversity is a challenge for poor households in South Asia because nutritious foods, including animal source foods and some fruits and vegetables, are relatively expensive (Dewey 2016; Dizon and Herforth 2018; Headey et al. 2017). Minimum dietary diversity in children aged 6–23 months is associated with household wealth in South Asian countries (Torlesse and Aguayo 2018), and the success of approaches to improve caregiver knowledge and skills to prepare complementary foods depends on whether they have access to affordable foods (Aguayo 2017). The social protection sector can support national efforts to improve complementary feeding by providing cash, vouchers, or in-kind transfers that enable poor families with young children to receive or purchase nutritious food for their young children, particularly in times of economic shock (UNICEF 2020a). Such approaches are likely to be most effective when combined with interventions to improve caregiver knowledge and skills on complementary feeding (Bhutta et al. 2013).

We found that the intent to improve early childhood nutrition and complementary feeding is not comprehensively included in social protection policies and strategies in South Asian countries, except in India and Nepal. A recent study in India that children who received the food supplements through the Integrated Child Development Services programme were more likely to have improved dietary practices (Nguyen et al. 2018). However, there are ongoing concerns regarding the formulation, quality, stock-outs, coverage, and

leakage of the take-home rations supplied by the programme (Nguyen et al. 2018; Kandpal 2011; Vaid et al. 2018). In Nepal, an evaluation of the Child Grant programme found that the cash transfers increased the percentage of households purchasing nutritious food such as meat products and pulses. However, there was no impact on dietary diversity, possibly due to the limited size of the transfer and insufficient concurrent support from the health system to improve complementary feeding practices (Renzaho 2017; Renzaho et al. 2019). Bhutan and Sri Lanka also reported nationwide social protection programmes that are designed to improve complementary feeding or nutrition outcomes, despite gaps in the enabling environment.

While these initiatives are promising, a review of evidence from the Asia region concluded that social protection programmes are not being optimized for their full potential (FAO et al. 2019). Many programmes are not implemented at national scale, nutritionally vulnerable women and children are not always directly targeted, and the transfer amounts are too low to impact on consumption patterns. To make more rapid progress, the design, implementation, monitoring, and evaluation of social protection systems should incorporate objectives and design features that are sensitive to the nutrition needs of vulnerable groups, including the diets of young children.

Improvements in child feeding and care practices can also be achieved through labour protections, including paid maternity leave and breastfeeding breaks at the workplace that allow women to continue breastfeeding when they return to work. The provisions of the International Labour Organization Maternity Protection Convention, 2000 (No. 183) and its accompanying Recommendation (No. 191) enable working women to practice continued breastfeeding when they return to work. We found that all countries in South Asia have maternity protection laws, but they comprehensively conform to Convention 183 and Recommendation 191 in only Nepal and Sri Lanka. Women who work in the informal sector are particularly vulnerable and need additional support from their families and communities to balance the demands of work while breastfeeding (UNICEF 2016). Across South Asia, fewer than one-third of female workers are entitled to maternity leave due to gaps in coverage, particularly in the informal sector (ILO 2014).

WASH system

The WASH system, together with the health system and livestock sectors, can help ensure that complementary foods are safely prepared and fed to children by reducing environmental contamination from human and livestock faeces, ensuring safe water supply, and improving handwashing, food preparation and feeding behaviours (UNICEF 2020a). There have been major improvements in access to basic drinking

water supplies and basic sanitation facilities across the South Asia region (UNICEF 2019); however, millions of families still defecate in the open and lack hygiene facilities on their household premises.

Our study found that national WASH policies are in place, but do not adequately focus on food hygiene in early life. Only three countries — India, Nepal, and Pakistan — have policies, strategies, or plans that comprehensively address the need of WASH actions to improve nutrition outcomes and/or the safe preparation, storage, and feeding of complementary foods. Education of mothers of young children on hygienic food preparation in rural Bangladesh reduced pathogenic contamination of food and water in intervention households (Islam et al. 2013), while a study in urban slums in India reported an increase in the uptake of improved hygiene practices, a reduction in the percentage of mothers who had pathogens on their hands, and a reduction in diarrhoea between baseline and endline (Sheth and O'brah 2004; Sheth et al. 2006). India is implementing a nationwide initiative to integrate nutrition and WASH services, but elsewhere these initiatives are either in selected areas only (Afghanistan, Pakistan, and Sri Lanka), at pilot stage (Bangladesh and Bhutan) or absent (the Maldives and Nepal).

Implications

This analysis has brought to light significant gaps in the enabling environment for complementary feeding in South Asia, and the translation of policies, strategies, and plans to services for children and their caregivers. In particular, there are considerable missed opportunities within the food and social protection systems to improve diets in early life. These gaps are contributing to the slow progress in improving young children's complementary foods and feeding practices in the region and require much greater attention.

National and sub-national governments should take stock of missing elements in the enabling environment for complementary feeding, and better understand and address the barriers and bottlenecks to implementing legal measures and programmes at scale across all systems, including at the community level. With this information, governments will be in a better position to mobilize government systems and institutions, and prioritize resources to improve young children's diets and feeding practices. These policy and programme interventions should be guided by an understanding of the country-specific drivers of poor complementary foods and feeding practices. A multi-system framework for improving the diets of young children (UNICEF 2020a) can provide a useful starting point to identify the actions needed to strengthen the enabling environment and programmes.

In addition, it is crucial that South Asian governments recognize and act on the need for a coherent and coordinated response across systems. Studies have shown that there is a

greater impact on diets when different systems are working concurrently to address the multiple constraints that families face in feeding their children. For example, information and counselling on complementary feeding is likely to have greater effects when implemented alongside programmes to improve the availability, access to, and affordability of nutritious foods through actions by the food and social protection systems, such as home gardens and cash transfers (Aguayo 2017; Ruel and Alderman 2013).

Finally, while the actions — or inactions — of governments can potentially impact children's diets more strongly than any other group in society, they cannot act alone. Business, development partners, civil society organizations, academicians, and families all have important roles to play in supporting governments in their efforts to improve diets in early life.

Limitations

Information on the status of policies and programmes were provided by country-specific groups of key informants, based on their knowledge and review of policies and programmes. Although detailed guidance on the definitions of indicators and categories was provided to assess the status of policies and programmes, there may have been differences across countries in how the guidance was interpreted. The review largely focused on the enabling environment at national level and did not examine the status at subnational level. With increasing decentralization in the region, more information on sub-national variations in the enabling environment would be useful.

Conclusions

Governments across South Asia have all taken action to put policies, legislation, programmes, and services in place to improve complementary feeding through the food, health, social protection, and WASH systems. However, no country has a comprehensive set of policies, strategies, plans, and legal measures to protect, promote, and support complementary feeding, and few services are being delivered at scale, particularly for services delivered through the non-health systems.

The weak policy and programme landscape is contributing to the lack of progress in improving children's diets in early life. Given the multisectoral determinants of young children's diets and feeding practices, it is important that government policies, strategies, and plans lay out clear mandates for coherent action across multiple systems (food, health, social protection, and WASH systems) and that barriers and bottlenecks in translating national commitments to

services are identified and addressed to enable implementation at scale.

Further research is needed to better understand these implementation constraints, such as a lack of planned multi-sector actions, constrained financing, limited workforce capacities, weak delivery platforms, and a lack of accountability to deliver results. In addition, operational research is needed on the factors and processes that enable multi-system action to secure nutritious, safe, affordable, and sustainable diets for young children in South Asia.

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Declarations

Ethics approval Ethical approval was not required because the research did not involve any vulnerable groups, all participants were reporting on subject matters that were within their professional competence, and the data were not considered to be sensitive or confidential in nature.

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

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References

- Aguayo VM (2017) Complementary feeding practices for infants and young children in South Asia. A review of evidence for action post-2015. *Matern Child Nutr* 13(S2):e12439. <https://doi.org/10.1111/mcn.12439>
- Avula R, Menon P, Saha KK, Bhuiyan MI, Chowdhury AS, Siraj S et al (2013) A program impact pathway analysis identifies critical steps in the implementation and utilization of a behavior change communication intervention promoting infant and child feeding practices in Bangladesh. *J Nutr* 143(12):2029–2037. <https://doi.org/10.3945/jn.113.179085>
- Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S et al (2013) Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet* 382(9890):452–477. [https://doi.org/10.1016/S0140-6736\(13\)60996-4](https://doi.org/10.1016/S0140-6736(13)60996-4)
- Bird FA, Pradhan A, Bhavani RV, Dangoura AD (2019) Interventions in agriculture for nutrition outcomes: a systematic review focused on South Asia. *Food Pol* 82:39–49
- Choufani J, Kim SS, Nguyen PH, Heidkamp R, Grummer-Strawn L, Saha KK et al (2020) Measuring coverage of infant and young child feeding counselling interventions: a framework and empirical considerations for survey question design. *Matern Child Nutr* 16(4):e13001. <https://doi.org/10.1111/mcn.13001>
- Development Initiatives (2020) 2020 global nutrition report: action on equity to end malnutrition. Development Initiatives, Bristol
- Dewey KG (2016) Reducing stunting by improving maternal, infant and young child nutrition in regions such as South Asia: evidence, challenges and opportunities. *Matern Child Nutr* 12(S1):27–38
- Dizon F, Herforth A (2018) The cost of nutritious food in South Asia. World Bank policy research working paper 8557. World Bank Group, Washington DC
- Dizon F, Josephson AL, Raju D (2019) The nutrition sensitivity of food and agriculture in South Asia. World Bank policy research working paper 8766. World Bank Group, Washington DC
- FAO, UNICEF, WFP, WHO (2019) Placing nutrition at the Centre of social protection. Asia and the Pacific regional overview of food security and nutrition 2019. Food & Agriculture Organization, Bangkok
- Gillespie S, Haddad L, Mannar V, Menon P, Nisbett N, the Maternal and Child Nutrition Study Group (2013) The politics of reducing malnutrition: building commitment and accelerating progress. *Lancet* 382(9891):552–569. [https://doi.org/10.1016/S0140-6736\(13\)60842-9](https://doi.org/10.1016/S0140-6736(13)60842-9)
- Harding KL, Aguayo VM, Webb P (2018) Birthweight and feeding practices are associated with child growth outcomes in South Asia. *Matern Child Nutr* 14(S4):e12650. <https://doi.org/10.1111/mcn.12650>
- Haselow NJ, Stormer A, Pries A (2016) Evidence-based evolution of an integrated nutrition focused agriculture approach to address the underlying determinants of stunting. *Matern Child Nutr* 12(S1):155–168. <https://doi.org/10.1111/mcn.12260>
- Headey D, Kirvonen K, Hoddinott J (2017) Animal sourced foods and child stunting. IFPRI discussion paper 01695. International Food Policy Research Institute, Washington DC

- ILO (2014) Maternity and paternity at work. Law and practice across the world. International Labor Organization, Geneva
- Islam MS, Mahmud ZH, Gope PS, Zaman RU, Hossain Z, Islam MS et al (2013) Hygiene intervention reduces contamination of weaning food in Bangladesh. *Tropical Med Int Health* 18(3):250–258. <https://doi.org/10.1111/tmi.12051>
- Kandpal E (2011) Beyond average treatment effects: distribution of child nutrition outcomes and program placement in India's ICDS. *World Dev* 39(8):1410–1421. <https://doi.org/10.1016/j.worlddev.2010.12.013>
- Kim R, Mejia-Guevara I, Corsi DJ, Aguayo VB, Subramanian SV (2017) Relative importance of 13 correlates of child stunting in South Asia: insights from nationally representative data from Afghanistan, Bangladesh, India, Nepal, and Pakistan. *Soc Sci Med* 187:144–154. <https://doi.org/10.1016/j.socscimed.2017.06.017>
- Locks LM, Dahal P, Pokharel R, Joshi N, Paudyal N, Whitehead RD et al (2018) Infant and young child feeding (IYCF) practices improved in 2 districts in Nepal during the scale-up of an integrated IYCF and micronutrient powder program. *Curr Dev Nutr* 2(6):nzy019. <https://doi.org/10.1093/cdn/nzy019>
- Menon P, Nguyen PH, Saha KK, Khaled A, Sanghvi T, Baker J et al (2016) Combining intensive counseling by frontline workers with a nationwide mass media campaign has large differential impacts on complementary feeding practices but not on child growth: results of a cluster-randomized program evaluation in Bangladesh. *J Nutr* 146(10):2075–2084. <https://doi.org/10.3945/jn.116.232314>
- Mirkovic KR, Perrine CG, Subet GR, Mebrahtu S, Dahal P, Jeffers ME (2016) Micronutrient powder use and infant and young child feeding practices in an integrated program. *Asia Pac J Clin Nutr* 25(2):350–355. <https://doi.org/10.6133/apjcn.2016.25.2.19>
- National Planning Commission (2017) Multi-sector nutrition plan (2018–22). National Planning Commission, Government of Nepal, Kathmandu
- Nguyen PH, Avula R, Headey D, Tran LM, Ruel MT, Menon P (2018) Progress and inequalities in infant and young child feeding practices in India between 2006 and 2016. *Matern Child Nutr* 14(S4):e12663. <https://doi.org/10.1111/mcn.12663>
- Nguyen PH, Kim SS, Tran LM, Menon P, Frongillo EA (2019) Intervention design elements are associated with frontline health workers' performance to deliver infant and young child nutrition services in Bangladesh and Vietnam. *Curr Dev Nutr* 3(8):nzz070. <https://doi.org/10.1093/cdn/nzz070>
- Osei AK, Pandey P, Nielsen J, Pries A, Spiro D, Davis D et al (2017) Combining home garden, poultry, and nutrition education program targeted to families with young children improved anemia among children and anemia and underweight among nonpregnant women in Nepal. *Food Nutr Bull* 38(1):49–64. <https://doi.org/10.1177/0379572116676427>
- PAHO/WHO (2003) Guiding principles for the complementary feeding of breastfed children. Pan American Health Organization, Washington DC
- Pries AM, Huffman SL, Champeny M, Adhikary I, Benjamin M, Coly AN et al (2017) Consumption of commercially produced snack foods and sugar-sweetened beverages during the complementary feeding period in four African and Asian urban contexts. *Matern Child Nutr* 13(Suppl 2):e12412. <https://doi.org/10.1111/mcn.12412>
- Pries AM, Rehman AM, Filteau S, Sharma N, Upadhyay A, Ferguson EL (2019) Unhealthy snack food and beverage consumption is associated with lower dietary adequacy and length-for-age z-scores among 12–23-month-olds in Kathmandu Valley, Nepal. *J Nutr* 149(10):1843–1851. <https://doi.org/10.1093/jn/nxz140>
- Renzaho AM, Chen W, Rijal S, Dahal P, Chikazaza IR (2019) The impact of unconditional child cash grant on child malnutrition and its immediate and underlying causes in five districts of the Karnali zone, Nepal — a trend analysis. *Arch Public Health* 77:24(2019). <https://doi.org/10.1186/s13690-019-0352-2>
- Renzaho AMN (2017) Child Grant Programme and the health and nutritional well-being of under-five children in the Karnali zone of Nepal: assessing the impact of integrated social protection services and trend analysis in five districts — re-analysis of secondary data. United Nations Children's Fund, Kathmandu
- Ruel MT, Alderman H (2013) Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? *Lancet* 382(9891):536–551
- Sheth M, Gurudasani R, Mistry V, Mehrotra S, Seshadri S (2006) Food safety education as an effective strategy to reduce diarrhoeal morbidities in children less than two years of age. *Indian J Nutr Diet* 43(1):22–31
- Sheth M, O'brah M (2004) Diarrhea prevention through food safety education. *Indian J Pediatr* 71(10):879–882
- Siekman K, Begin F, Situma R, Kupka R (2017) The potential role of micronutrient powders to improve complementary feeding practices. *Matern Child Nutr* 13(S2):e12464. <https://doi.org/10.1111/mcn.12464>
- Thow AM, Karn S, Devkota MD, Rahseed S, Roy SK, Suleman Y et al (2017) Opportunities for strengthening infant and young child feeding policies in South Asia: insights from the SAIFRN policy analysis project. *BMC Pub Health* 17:404. <https://doi.org/10.1186/s12889-017-4336-2>
- Torlesse H, Aguayo VM (2018) Aiming higher for maternal and child nutrition in South Asia. *Matern Child Nutr* 14(Suppl 4):e12739. <https://doi.org/10.1111/mcn.12739>
- Torlesse H, Raju D (2018) Feeding of infants and young children in South Asia. World Bank policy research working paper 8655. World Bank Group, Washington DC
- UNICEF (2011) Programming guide: infant and young child feeding. United Nations Children's Fund, New York
- UNICEF (2016) From the first hour of life: making the case for improved infant and young child feeding everywhere. United Nations Children's Fund, New York
- UNICEF (2019) The state of the world's children 2019. Children, food and nutrition: growing well in a changing world. United Nations Children's Fund, New York
- UNICEF (2020a) UNICEF programming guidance. Improving young children's diets during the complementary feeding period. United Nations Children's Fund, New York
- UNICEF (2020b) UNICEF's expanded database on infant and young child feeding. United Nations Children's Fund, New York. <https://data.unicef.org/resources/dataset/infant-young-child-feeding/>. Accessed 06 August 2020
- UNICEF, JMP, WHO (2018) Progress on household drinking water, sanitation and hygiene, 2000–17. Special focus on inequalities. United Nations Children's Fund, New York. <https://www.unicef.org/reports/progress-drinking-water-sanitation-and-hygiene>. Accessed 15 October 2020
- Vaid A, Avula R, George NR, John A, Menon P, Mathews P (2018) Review of the integrated child development services' supplementary nutrition program: take home ration for children. POSHAN research note 7. International Food Policy Research Institute, New Delhi. <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/132804/filename/133014.pdf>. Accessed 4 November 2019
- WHO (2005) Guiding principles for feeding non-breastfed children 6–24 months of age. World Health Organization, Geneva
- WHO (2010) Set of recommendations on the marketing of foods and non-alcoholic beverages to children. World Health Organization, Geneva
- WHO (2016) Ending inappropriate promotion of foods for infants and young children, WHA 69.9. World Health Organization, Geneva

- WHO (2018) Marketing of breast-milk substitutes: national implementation of the international code, status report 2018. World Health Organization, Geneva
- WHO (2020) Marketing of breast-milk substitutes: national implementation of the international code, status report 2020. World Health Organization, Geneva
- WHO, FAO (2006) Guidelines on food fortification with micronutrients. World Health Organization, Geneva

WHO, UNICEF (2003) Global strategy for infant and young child feeding. World Health Organization, Geneva

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