Food and nutrition security of infants and young children: Breastfeeding and complementary feeding

Nazeeia Sayed,[i] Sara Jewett[ii] & Lynette Daniels[iii]

Breastfeeding an infant exclusively for six months,[iv] with the gradual introduction of nutrient dense foods[v] from six months until the child transitions to the family diet, are recommended as key interventions for better food and nutrition security for infants and young children.[1] Breastmilk continues to be an important contributor to nutrition after six months, but other foods are then needed to meet the growing infant's nutrient needs. The phase that follows exclusive breastfeeding when foods are introduced to the infants' diet is known as the complementary feeding phase.

This chapter examines the current status of infant and young child feeding in South Africa and identifies opportunities for intervention, by responding to the following questions:

- What is the current infant and young child feeding situation in South Africa?
- What kind of support is needed to ensure optimal feeding practices?
- What can be done at the level of the individual mother and child?
- How can we support infant and young child feeding in different settings?
- How can we address the societal drivers of infant and young child feeding practices?

What is the current infant and young child feeding situation in South Africa?

Infant and young child feeding (IYCF) in South Africa is far from optimal as outlined in Table 1. According to the 2016 South African Demographic and Health Survey (SADHS),[2] only 32% of infants younger than six months were exclusively breastfed. In addition to low exclusive breastfeeding rates, complementary foods were often introduced too early (before six months of age), and complementary feeding diets were characterised by poor dietary diversity (meaning there is little variety in the diet).[3] Only 16% of 6 – 8-month-olds and 16% of 9 – 11-month-olds met the criteria for a minimally acceptable diet[2] (this is a composite indicator of dietary variety and meal frequency), and foods of minimal nutritional value were also given to infants (such as salty snacks).[3]

This is a concerning situation as nutrition during the first 1,000 days of life, from conception, through pregnancy, and during the first two years of life, provides a unique opportunity for building healthier and more prosperous futures. Poor nutrition in the first 1,000 days disadvantages a child from growing and developing optimally, and from thriving and learning well at school. It increases their risk for chronic disease later in life.[4, 5] Making investments to ensure that infants and young children are provided with optimal nutrition in their early years is a wise decision that has long-term pay-offs.

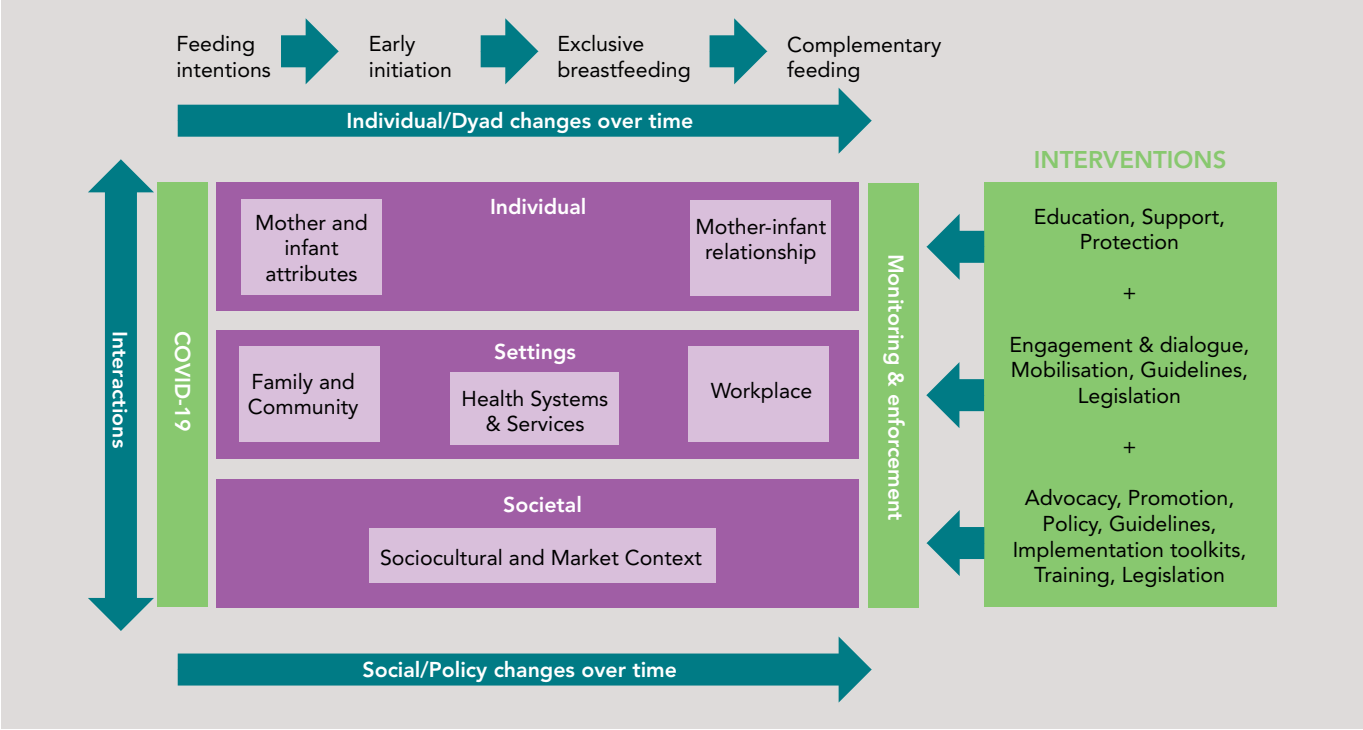
Malnutrition is, however, often intergenerational where children are disenfranchised even before they are born as a result of dietary inadequacies in the first 1,000 days of life[6], a concept referred to as slow violence to malnutrition.[7] The length-for-age of an infant is used to define stunting. Infants are classified as stunted if their length-for-age is lower than a reference standard on the growth curve, an indication of chronic undernutrition. The 2016 SADHS[2] reported that 32% of infants below the age of six months were stunted compared to 27% of children under five years old. Furthermore, it also highlighted an increase in stunting from 8 to 23 months of

Table 11: Current status of infant and young child feeding in South Africa

- High breastfeeding initiation rates
- Low rates of exclusive breastfeeding to six months
- Early introduction of complementary foods (before six months)
- Poor dietary diversity in infants and young children diets
- Foods of minimal nutritional value are provided
- Many infants do not meet the criteria for minimally acceptable diets

i School of Public Health, University of the Western Cape
ii Health & Society Division, School of Public Health, University of the Witwatersrand
iii Division of Human Nutrition, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University
iv This means the infant receives only breast milk (no water, other liquids or any other foods).
v Infants have a small stomach but high energy and nutrient needs for growth and development.

Figure 16: Determinants of infant food and nutrition security



Adapted from: Rollins NC, Bhandari N, Hajeebhoy N, Horton S, Lutter CK, Martines JC, Piwoz EG, Richter LM, Victora CG & TLBS Group (2016) Why invest, and what it will take to improve breastfeeding practices? *The Lancet*, 387(10017): 491–504. doi:10.1016/S0140-6736(15)01044-2.

age, which coincides with the complementary feeding phase.

What kind of support is needed to improve the situation?

To improve the food and nutrition security of infants and young children in South Africa, we need to ensure that more mothers initiate breastfeeding, breastfeed exclusively for six months, introduce nutrient dense complementary foods at the age of six months, and continue breastfeeding to two years and beyond. To achieve these desired outcomes requires support at all levels of society: government, the health system, community, family and workplaces. The nature of support differs depending on the stage of a child's development. As shown in Figure 16, the food and nutrition security for children is shaped by determinants at the individual level of the mother and infant; in various settings, such as the family and community, workplace, health system and services; and at the societal level – where socio-cultural norms, market practices and the broader economic situation affect the broader food environment. Different types of interventions are required to alter dynamics at each of these levels.

Apart from poor breastfeeding and complementary feeding practices, infections and illness can also contribute to poor infant growth and development. Therefore, efforts to reduce infections such as clean water, hygiene and sanitation, deworming, vitamin A supplementation and immunisation are also needed to optimise health, growth and development (see Case 5 on WASH and infant nutrition by Doug Momberg).

This chapter describes infant and young child food and nutrition security using a multi-level lens. Some of the barriers, facilitators and opportunities, at the individual, settings and societal levels will be discussed in the South African context. The COVID-19 pandemic's influence on the food environment of the infant and young child is also explored.

Acknowledgement is given to issues of equity and resource limitations that could impact on the various determinants of food and nutrition security of the infant and young child, but these issues are beyond the scope of this chapter. The individual, settings and societal level elements from Figure 1 are used to structure the discussion that follows. Interventions described in Figure 1 are topline, but more specific recommendations are made in each section of this chapter. The Figure also indicates changes over time, interactions between the various elements, and monitoring and evaluation. These are all important features that need to be acknowledged when considering the various levels impacting on IYCF, but these are not addressed in this chapter.

What can be done at the level of the individual mother and child?

There are a myriad of individual level factors that could impact on infant feeding. With only 34% of women employed in South Africa, and 43% of households being female-headed[2], the stress of unemployment and lack of support (financial, emotional, etc.) from a partner affects both the mother and infant.

The behaviour of caregivers, their knowledge, their beliefs and the influence exerted on them by others are important considerations in the set of food system-related drivers that impact on infant feeding.[8] A lot of communication around infant feeding has targeted mothers. This communication is often delivered in health facilities, although mobile platforms like MomConnect are emerging as new channels.[9] However, the idea that all caregivers are singularly driven by health motivations and that they have the power to act on information like "breast is best" is not supported. Evidence suggests that such communication is not sufficient for most mothers to act, as they face social and structural barriers.[10]

A mother's HIV status has also been consistently associated with different feeding choices in South Africa. Prior to the Tshwane Declaration, which ended government provision of free formula to HIV exposed infants, many mothers living with HIV may have opted for formula to reduce risks of vertical transmission. However, recent evidence shows that HIV positive mothers are more likely to exclusively breastfeed for longer than non-infected mothers, motivated by the same desire to protect their infants.[11]

Maternal depression also impacts infant feeding. A 2018 review highlighted that maternal depression can delay breastfeeding initiation, contribute to breastfeeding cessation, and lead to the early introduction of food, and introduction of other commercial milks.[12] Potential harmful practices, such as unhygienic feeding practices, the inability to recognise satiety cues, and the addition of cereal to bottles (possibly to encourage infants to sleep longer), may be increased in depressed mothers.[12]

Food insecurity is related to depression and affects both parenting practices and infant feeding decisions.[13] Adult and child hunger in South Africa appear to be declining since the start of the COVID-19 lockdown but remain higher than pre-COVID-19 levels.[14] Adult hunger is higher than child hunger levels, which may indicate that children are protected to some extent by adults in the household. A multi-country study that included a large sample size (n = 149 countries) with varying individual incomes found that as individual-level food insecurity worsened, mental health declined.[15]

The COVID-19 pandemic is likely to increase depression and anxiety, and mothers with infants and young children may need extra support. A high proportion of new mothers in the United Kingdom reported feelings of low mood, loneliness and anxiety during the country's lockdown due to COVID-19, and social support from partners, family and peers, as well as support for her own health, were important for better mental health.[16] Mothers and communities need to be educated about mental health, and where and how to access support. The assessment and diagnosis of the mental health status of mothers should be better integrated into health services so that health workers are more aware of the issue and can also consider it in their infant feeding counselling.

How can we support infant and young child feeding in different settings?

Families and communities

In order to create supportive environments for optimal feeding, infant feeding communication needs to engage not only mothers, but also families and communities.[5] A communication study demonstrated how these groups need different kinds of information to persuade them to support optimal feeding.[17] South Africa has evidence of societal pressure and family interference,[18] as well as the strong influence of grandmothers on infant feeding[19, 20]. Engaging with these influencers to address their particular needs and interests can increase optimal feeding practices.[17] Unwed mothers, in particular, face pressure to adhere to family traditions and decisions related to feeding. In the context of South Africa's high level of absent fathers, buying infant formula is one way that families pressure males to take responsibility.[21] This pressure is closely related to a common perception that formula is superior to breastmilk.[21] A change in infant feeding practices is unlikely if these influencers are not engaged and their concerns addressed.[10]

Health systems and services

Health systems and services should inform and support mothers in optimal infant feeding decisions from the time they access services antenatally, to discharge after delivery, and continue when mothers access health services with their infants. One such initiative is the Mother Baby Friendly Initiative (MBFI). This should ensure a continuum of care that starts antenatally, continues during birth and delivery, and into the community environment. South Africa has made significant improvements in MBFI accreditation but sustaining MBFI practices after accreditation has been problematic.[22] The MBFI has led to increased initiation of breastfeeding

in birthing facilities, but exclusive breastfeeding rates have remained low.[23] Step 10 of MBFI – the creation of breastfeeding support for mothers in communities – is often inadequate.[24] Stronger linkages are needed between health facility and community-based support, such as La Leche League, the Philani mentor mother programme, Flourish, and Mothers-to-Mothers. The training and employment of an adequate cadre of community health workers (CHWs) in ward-based outreach teams must also be ensured to provide better postnatal support to mothers through home visits.

Case 12: How is the marketing of foodstuffs for infants and young children regulated in South Africa?

Catherine Pereira-Kotze, PhD in Public Health Candidate, University of the Western Cape

As urged by the WHO's International Code of Marketing of Breast Milk Substitutes,[56] the South African Department of Health legally instituted the Regulations R991 Relating to Foodstuffs for Infants and Young Children,[57]gazetted on 6 December 2012. The Regulations R991 aim to protect and promote optimal infant and young child feeding, encourage safe and appropriate use of commercially processed foods, and remove commercial pressures from the infant feeding environment so that all caregivers receive independent, objective information and all mothers who wish to breastfeed are supported to do so.

Implementation, monitoring and enforcement of R991 are challenging due to fragmented scopes of practice and capacity constraints. Violations are currently reported on an ad hoc basis by individuals or organisations to the National Department of Health (NDoH) and are usually resolved by mediation between government officials and the violators. However, R991 states that "Any person who contravenes these regulations is guilty of an offence and is liable to penalties as prescribed by the Act", which include fines and imprisonment.[57] These penalties have not yet been used to enforce R991, partly due to the lack of monitoring of the regulations and the rehabilitative approach of the NDoH. This is linked to a shortage of environmental health practitioners, who are the designated 'inspectors' for all regulations of the Foodstuffs, Cosmetics and Disinfectants Act;[58] capacity constraints at a national level; and a lack of awareness among key stakeholders, including the child health community.

Since R991 was gazetted, there have been many violations by breast milk substitutes (BMS) manufacturers, retail outlets, health establishments and health professionals. Most violations related to labelling and promotion in retail outlets have been stopped, but it is particularly difficult to stop violations on digital platforms, including websites and social media. Companies (including BMS manufacturers) use these spaces to implement carefully calculated marketing algorithms to personalise and target marketing to specific consumers.[4] Manufacturers of BMS have large marketing budgets and trained professionals whose sole responsibility is to create brand presence, loyalty, and relationships with consumers.[59] Digital content also changes rapidly, and it is often argued that many provisions of regulations are open to interpretation, even though Guidelines for Industry and Health Care Personnel on R991 have been developed by the NDoH.[60] On South African social media platforms, there are many posts by BMS manufacturers that use subtle tactics to violate national legislation and global guidance. This is remarkably similar to what has been found in high-income countries.[59]

Several actions are needed:

- A comprehensive update of R991 is needed as both global guidance and digital marketing tactics have changed and expanded significantly since 2012.
- The Foodstuffs Act needs to be updated to strengthen the monitoring of different regulations. Designated inspectors need to be trained so that they can identify, report and resolve violations efficiently. In addition, all stakeholders (health professionals, distributors, retailers, advertisers, conference organisers and the general public) need to be sensitised to the content and principles of R991. This would probably best be achieved via a mass public health awareness campaign.
- Lastly, it is the responsibility of everybody – local authorities, manufacturers, distributors and retailers, health professionals, health facilities, the media and civil society – and not only government, to report violations[i] and ensure that regulations such as R991 are implemented. This "whole of society approach" is the only way that infant and young child feeding will be protected, promoted, and supported in South Africa.

i Violations of the Regulations R991 can be reported by sending an email with photographic evidence and as much of a description of the violation as possible (date, time, place, type of violation) to Madome Manyuha at the National Department of Health: codewatch@health.gov.za

A lack of health and nutrition promotion and suboptimal use of the Road to Health Booklet messages is also of concern.[25] Health care workers (HCWs) play an important role in influencing the infant feeding decisions of mothers. Still, there is an abundance of inconsistent messages and misinformation on IYCF from HCWs.[19, 26-28] Paediatric food-based dietary guidelines have been tested[29] but not yet adopted by the National Department of Health (NDOH).

The screening and identification of malnutrition and appropriate IYCF counselling by HCWs in South Africa could still be improved.[30] This is a great concern given that there are likely to be more malnourished children due to COVID-19, and efforts need to focus on preventing wasting in children.[31] The routine measurement and assessment of length/height, weight and mid upper arm circumference of all infants and young children needs to be enforced at all healthcare facilities. Community-based growth monitoring and nutrition surveillance utilising CHWs in ward-based outreach teams needs to be strengthened for the early detection and support of malnourished children. Bhutta and colleagues emphasise that in addition to education on complementary feeding, food supplements need to be provided to food insecure populations.[32] The network of local food parcel distribution strengthened due to the COVID-19 pandemic could be further leveraged, and the momentum and lessons learnt from the experience of food distribution during the lockdown taken advantage of to reach vulnerable infants and young children.

There is already some evidence of how COVID-19 has impacted the public health care sector in South Africa. Twenty-five percent of women did not go to the clinic when their child needed immunisation, and 11% of HIV positive mothers reported running out of their antiretrovirals (ARTs).[33] Fear of the coronavirus was the most common reason cited for not accessing healthcare services.[33] Communities need to be reassured and reminded to continue to safely access essential services such as immunisation, growth monitoring and vitamin A supplementation, as we deal with COVID-19. It is not known what mothers in South Africa have experienced with regards to infant feeding support since the COVID-19 lockdown and social distancing measures were put in place. Close to half of the mothers who had delivered during the United Kingdom lockdown indicated that they had inadequate help and support with regards to feeding their infants.[34] Mothers should be supported to practice rooming-in (i.e. mother and infant stay together 24 hours a day), and health workers must reassure mothers and communities on the safety and benefits of breastfeeding, in addition to the messages provided on government platforms like Side-by-Side or MomConnect.

The workplace

The little evidence currently available in South Africa indicates few supportive breastfeeding practices in the workplace.[35] The lack of breastfeeding breaks, lack of space to express breastmilk, unsupportive supervisors and pressure from colleagues, all contribute to women feeling that they do not have breastfeeding support at work.[36] One of the barriers to workplaces supporting mothers may be the perceived cost implications of interventions,[37] and employers may be uncertain how to create an enabling workplace environment. Providing space for employees to breastfeed/express, and breastfeeding/expressing breaks, are low-cost interventions[10] that can reduce the obstacles that many employed breastfeeding women face.

Legislation is an important driver of workplace support for breastfeeding. According to Section 25 of the Basic Conditions of Employment Act,[38] employees are entitled to at least four consecutive months of maternity leave. Yet most maternity leave is unpaid or partially paid. Many women in informal and domestic work sectors, and women living in vulnerable communities, do not get assistance from the maternity benefit fund as they are ineligible (they do not contribute to the Unemployment Insurance Fund). Women often return to work early as they do not have any income, and are then separated from their infants.[23] Another improvement in legislative directives is the passing of paid parental leave effective from 1 January 2019, which introduced 10 days leave for parents who are not biological mothers (mostly fathers and adoptive parents).[39] This change is very important for breastfeeding as it allows partners to support mothers.

In terms of the Code of Good Practice on the protection of employees during pregnancy and after childbirth, employees who are breastfeeding are entitled to 30-minute breastfeeding breaks twice a day for the first six months of the child's life.[40] In reality, employees and employers are mostly unaware of these legislated breastfeeding breaks.[23, 36] Furthermore, the Code fails to address the requirement that the employer provides a suitable space for expressing and storing breastmilk. Neither does it specify whether the breastfeeding breaks are paid or unpaid, and there is no provision for penalties for employers who fail to comply. The Department of Labour needs to monitor the implementation of the Code to ensure better compliance. The NDOH should consider recognition and rewards (e.g. tax breaks) for employers acting in support of breastfeeding.

Case 13: Preventing NCDs using social and behaviour change communication: Evidence-based and multi-level Infant and Young Child Feeding promotion

Sara Jewett[i]

A growing body of evidence highlights the link between early nutrition and the development of non-communicable diseases (NCDs). For instance, exclusive breastfeeding (EBF) for the first six months has been associated with a reduced risk of type-2 diabetes later in life.[71,72]

Rollins and colleagues's conceptual framework on the determinants of infant and young child feeding (IYCF) identifies a range of influences from the individual beliefs and perceptions of parents, to family pressure, socio-cultural norms and the structural environment, including policy.[73]

Interventions that seek to promote healthy IYCF practices must therefore address the key barriers and/or facilitators at each level of the socio-ecological system as outlined in Figure 16. McKee and colleagues propose three key strategies to support change:[74,75]

- **Advocacy** to address policy and legislation
- **Social mobilisation (SM)** to address social norms and reinforce other strategies
- **Behaviour change communication (BCC)** to address individual or interpersonal barriers or facilitators of change.

Each strategy has a range of specific techniques or approaches that can be chosen based on the context. In South Africa, where NCDs are high and EBF is low, we have synthesised evidence on barriers and facilitators of EBF.[76] However, our knowledge of community and structural barriers rarely translates into communication that addresses community leaders or policymakers.

BCC strategies are most commonly used in IYCF interventions, often focusing on changing the knowledge and beliefs of mothers or supporting healthcare workers. There are many different BCC tools to choose from - brochures and motivational interviewing techniques to mass media, edutainment and participatory drama. An example of a BCC campaign that draws on multiple individual and interpersonal tools is the Department of Health's Side-by-Side Campaign.

SM strategies complement BCC interventions. By building alliances to shift social norms and build collective efficacy, SM emphasises the importance of social dynamics in supporting (or preventing) optimal ICYF. For example, university staff and students have successfully mobilised for the provision of breastfeeding rooms[77,78] and are pushing for divestment from conflicted partnerships with the formula industry to create more enabling environments[79].

Advocacy strategies, including media advocacy, lobbying and policy advocacy, can alter the structural determinants of IYCF. While South Africa has policies in place to restrict the promotion of breastmilk substitutes,[80] other WHO dietary 'best buys', such as front of package labelling or banning of trans-fats,[81] are not in place. Selection of advocacy targets needs to account for context. With high levels of food insecurity, exacerbated by COVID-19,[82] IYCF activists are rightfully calling for an extension of the Child Support Grant to pregnant mothers to support their healthy food choices[83].

Whatever the mix, strategy selection should be based on evidence of which barriers or facilitators are most likely to shift behaviours and impact on health outcomes, e.g. NCDs, at the population level. This information can be gleaned from reviews of past interventions as well as primary research. A clear Theory of Change should clarify the logic behind the combination of strategies that are selected. For instance, if we increase working mothers' motivation to EBF; provide breastfeeding rooms at work and extend paid maternity leave, then EBF and continued breastfeeding among working mothers will increase.

In most instances, a combination of evidence-based strategies has more impact than campaigns focused on a single audience, e.g. mothers. SBCC campaigns addressing multiple audiences should be coordinated to ensure messages are harmonised, mutually reinforcing and coherent. For further step-by-step instructions on how to select SBCC strategies and design SBCC campaigns, visit sbccimplementationkits.org/courses/designing-a-social-and-behavior-change-communication-strategy.

i Health and Society Division, School of Public Health, University of the Witwatersrand

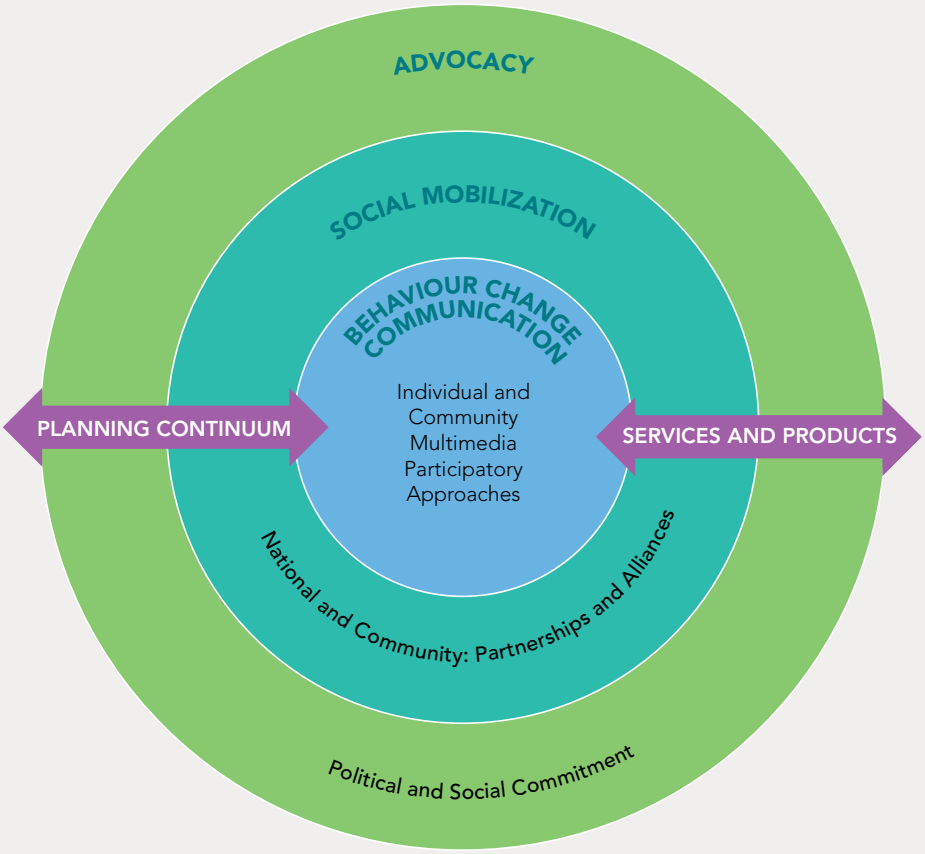
Figure 17: Social and behaviour change communication operates through three main strategies

Based on the socio-ecological analysis we can now choose the appropriate mix of strategies to address change:

Advocacy to raise resources and political and social leadership commitment for development goals;

Social mobilization for wider participation and ownership, including community mobilization; and

Behavior change communication for changes in knowledge, attitudes and practices of specific participants/ audiences in programs



Source: C-Change. C-Modules: A Learning Package for Social and Behavior Change Communication (SBCC). Washington, DC: C-Change/FHI 360. 2012.

An advocacy and communication campaign on the benefits of breastfeeding support for employers and employees, and the breastfeeding rights of employed women, is needed. The 'Breastfeeding in the workplace' toolkit and guide for employers and employees, developed by the NDOH,[41] should be the cornerstone of these efforts. The workplace breastfeeding support practice model is a useful tool that provides specific guidance to workplaces that want to start and/or strengthen the process of creating an enabling environment for breastfeeding.[36]

How can we address the societal drivers of infant and young child feeding?

Socio-cultural norms

The timing and content of what is fed to infants and young children is influenced by social and cultural beliefs. Mixed feeding before six months is a well-documented social norm in South Africa, closely related to beliefs that breastmilk is insufficient to nourish a child.[42] While the breastmilk substitute industry has exploited and reinforced such beliefs,[43] these beliefs also have social and cultural origins. Early ethnographies show that mixed feeding practices predated commercial formula.[44] The persistence of mixed feeding despite multiple infant feeding guideline changes highlights the socially embedded nature of this practice.

Infant feeding practices also relate to traditions that may be specific to particular ethnicities. Some of these are contextual, such as *ipupho*, where a mother's milk is considered unclean because she has been bewitched through a sexual dream.[45] Other cultural practices are designed to support infant health, such as the traditional Zulu medicine of *umfula* for 'cleansing' the infant's bowels of perceived impurities.[46] Many mothers are reluctant to abandon such practices, both because they share the beliefs and because they fear alienation from their social support if they were to refuse.[47] People in close-knit family or community systems experience pressure to follow social and cultural norms. Those who do not may face stigma or exclusion.[21, 48] As such, listening to communities about why they hold particular beliefs or norms about infant feeding is an important first step to meaningful change.

Table 12: Key recommendations to improve infant and young child food and nutrition security in South Africa

- If an improvement in infant and young child feeding practices is desired in South Africa, then mothers must be supported (financially, emotionally, socially)
- The NDOH should better integrate mental health screening and support for mothers into the healthcare system, and raise awareness of mental health in communities
- Communication to engage with community practices and norms in the area of infant and young child feeding should involve families and communities
- Breastfeeding mothers should be referred to community-based breastfeeding support groups and community health workers for postnatal support
- Health facility and community-level growth monitoring and promotion, and infant feeding counselling need to be improved
- All healthcare workers and healthcare delivery platforms need to convey consistent, standardised messages about optimal infant and young child feeding
- Advocacy and communication on workplace support for breastfeeding is needed, and employer practices in this regard need to be monitored
- Early access and a possible increase in the CSG need to be considered
- Formula marketing practices and transgressions against R991 needs to be monitored and reported to the NDOH
- Research and innovation in infant complementary foods needs to be supported
- Local nutrient-dense affordable foods for complementary feeding should be promoted
- The food parcels given to food insecure households with infants should include appropriate foods and supplements for complementary feeding

While breastfeeding is the norm in many communities, some mothers report discomfort in public settings, such as shopping malls or restaurants. Public shows of support for breastfeeding, whether in the form of a sign in a restaurant or an announcement made by a religious leader, are important in the normalisation of breastfeeding. These efforts alone, however, will not dismantle the sexualisation of breasts, which is the cause of some mothers' discomfort.

Market forces and economic considerations

South Africa has a high unemployment rate and a high reliance on social grants.[2] With unemployment increasing due to the COVID-19 pandemic, household income will be diminished even further and the reliance on social grants to meet needs will be higher. This will decrease household food security and make more children vulnerable to hunger and malnutrition. Consideration needs to be given to increasing the Child Support Grant (CSG), ensuring early access to the CSG, and providing regular food parcels to vulnerable households with nutrient dense food items that can help meet infant and young children's nutrient needs.

Another major market factor affecting infant feeding decisions is the promotion of formula milk. For many years, formula milk was marketed as an aspirational product, associated with prestige and social success, which undermined breastfeeding. This image is very difficult to undo.[49] While regulations around the marketing of breastmilk substitutes in South Africa, such as R991[50], are in place, global evidence suggests that the role of the food industry in marketing inappropriate products to infants and young children requires close surveillance, as much of this marketing takes place 'below the line' on social media (see case 12). A recent study on the high sugar content of baby foods in South Africa highlights the need for better regulations as well as parent education about food labels.[51] The study found that over 70% of food products targeting infants under one-year-olds in South Africa were sweet tasting, predisposing infants to developing a preference for sweet-tasting foods from an early age.

Helping families overcome barriers to feeding their children appropriate complementary foods, and promoting local foods, are two options proposed by Lutter and colleauges.[52] The Global Alliance for Improved Nutrition (GAIN) and UNICEF have highlighted chicken, fish, peanut butter, dried beans, beef liver, chicken liver, carrots and milk as the most affordable foods to fill nutrient gaps in the diets of children in South Africa.[53] Even though most of these food items are VAT exempt, the food price increases and household food insecurity seen this year will make these items more unaffordable for many households. The non-perishable items identified should be priority considerations for inclusion in food parcels to vulnerable households.

Processed food products can have a place in infants' diets in terms of convenience and providing a nutrient-dense option, but there are also commercial products commonly eaten by under one-year-old infants, such as processed meats, juices/sugar-sweetened beverages, chips or crisps and sweets or chocolates,[54, 55] that may displace more nutritious options. The infant feeding challenge provides an opportunity for innovation by the food industry – whether through biofortification or improved bioavailability of their fortified products for infants or exploring how to make these products more affordable and accessible. If it is possible to make healthier product offerings for the adult market, then it should be possible to make nutrient-dense options available for infants and young children (see Case 14).

With the surge of food hampers and emergency food supplies being made available to assist families with COVID-19, monitoring and enforcement of regulations on infant foods[50] will need to be strengthened. Guidelines need to be updated and disseminated to all providers of food parcels to provide greater clarity on how best to provide healthy and affordable foods for infants. Some manufacturers of breastmilk substitutes may see emergencies as an

Case 14: Opportunities and constraints for developing nourishing, indigenous complementary foods[i]

James Makame, Henriette De Kock and Naushad M. Emmambux[ii]

Child malnutrition remains a major public health problem, especially in Africa which is home to 40% of the world's stunted children.[61] This is partly because most African children are nourished on available and refined indigenous starch-based foods (such as cereals, roots, tubers and plantains).

The World Health Organization recommends exclusive breastfeeding for the first six months of life followed by the introduction of complementary foods and continued breastfeeding for at least two years to meet infants' nutritional requirements.[62] Indigenous starch based complementary porridges in rural and poor communities are usually prepared at home from cereal grains and root crops that are locally available and more affordable.[63-65] Yet the oral texture and viscosity of complementary porridges made from maize, cassava and sorghum are often difficult for infants to handle, even when diluted.[66,67] Diluting the porridge can lead to underweight as the resultant thin porridge does not contain sufficient nutrients to meet children's nutritional requirements. Therefore, indigenous complementary porridges should be appropriately adapted to make them safe and easy for infants to consume.[68] Orange-fleshed sweet potato has similar oral processing qualities to commercial porridge, but it is low in protein content and quality per dry weight. Cereals and roots crops (e.g. cassava) also lack the essential amino acid lysine, and some contain anti-nutritional factors (e.g. phytates and tannins) which inhibit the absorption of minerals (e.g. iron, zinc, calcium).

Opportunities and interventions

Roasting, malting, fermentation, germination and souring can be used at household level to reduce viscosity, produce pleasant textures and improve nutritional and cooking qualities of indigenous complementary foods.[9] Cereals, roots and tubers also need to be combined with pulses (e.g. peas, lentils, cowpeas and Bambara groundnuts) which are sources of good quality protein in order to develop more nourishing home-made porridge for children. These composite flours then need to be pre-processed to create a porridge that is easy for children to swallow.[70]

Research and development should aim to make indigenous complementary foods more nutritious, affordable and accessible to children. Africa must also invest in low-cost, convenient technologies (such as extrusion cooking, microwave and infrared heating) to process indigenous foods at community and household levels. This may require strong partnerships amongst consumers, industry, farmers, researchers and government to enhance technology transfer, so that African children derive health benefits from indigenous food crops. Policies promoting nutrition-sensitive food system value chains such as investments in appropriate agro-processing facilities are prerequisites. Children's diets must have a healthy balance of cereals, legumes, fruits and vegetables, dairy and meats. Overall, there exist great opportunities for developing nourishing indigenous complementary foods to enhance the nutritional status of African children.

i This case is based on the research supported in part by the National Research Foundation (NRF) of South Africa, Department of Science and Technology DSI/NRF Centre of Excellence in Food Security, the DST-CSIR Inter-bursary Support (IBS) Programme, and has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 862170.

ii Department of Consumer and Food Sciences, University of Pretoria

opportunity to distribute and market their products to needy and willing charities and organisations calling for donations of food. The infiltration of these products into communities can set a dangerous precedent for their continued use after COVID-19 and is likely to harm breastfeeding practices.

Table 2 summarises the key recommendations for improving infant and young child food and nutrition security in South Africa. As determinants of optimal IYCF are interrelated, government as well as child advocates need to prioritise which interventions are most likely to result in measurable and sustained change, not just alone, but synergistically (see case 13).

Conclusion

Infant and young child food and nutrition security is shaped by determinants at different levels and as such requires intervention and support at the level of the individual mother and child, the family and community, health systems and services, and the workplace. It also requires interventions to address societal determinants such as socio-cultural norms, and market and economic forces. These interventions require multi-stakeholder commitment and coordination, with clearer accountability and timelines in place to ensure they make a meaningful difference to the lives of children. A very real and urgent situation presents itself right now: if health services fail to engage with community-based organisations and social welfare services, then the battle against hunger and malnutrition will not be won. Commitment is not enough – clear implementation plans from all sectors of government are needed. We cannot afford not to act to improve infant and young child feeding. If we do not invest now, it will cost us more to repair the damage in the future.

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