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Review Article

The problem of suboptimal complementary feeding practices in West Africa: what is the way forward?

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Abstract

The objective of this paper was to review the policy implications of inadequate complementary feeding among children aged 6–23 months in West Africa. The review was undertaken from the initial results and findings from a series of studies on the comparison of complementary feeding indicators among children aged 6–23 months in four anglophone and seven francophone West African countries. It also examined a study of the determinants of suboptimal complementary feeding practices among children aged 6–23 months in those countries. Among the four complementary feeding indicators, it was only the introduction of solid, semi-solid or soft foods that was adequate among children in all the West African countries surveyed. The rates of the other complementary feeding indicators were found to be inadequate in all countries surveyed, although relatively better among children in the anglophone countries. Alarmingly, low rates of minimum acceptable diet were reported among children from both the anglophone and the francophone countries. Infants 6–11 months of age, children living in poor households, administrative/geographical regional differences and mothers' access to the media were some of the common risk factors for optimal complementary feeding practices in these countries. Assessing complementary feeding indicators and determinants of suboptimal complementary feeding practices in these West African countries is crucial to improving infant and young child feeding practices. It is recommended that governments and stakeholders of the West African countries studied make greater efforts to improve these critical practices in order to reduce child morbidity and mortality in the West Africa sub-region. Intervention studies on complementary feeding should target those socio-demographic factors that pose risks to optimal complementary feeding.

Keywords: inadequate, complementary feeding, suboptimal, undernutrition, anglophone, francophone.

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Introduction

In West Africa, high levels of undernutrition among children persist. National surveys reveal that close to one-third of children under 5 years of age are stunted (34.9%) and about 10% of children are wasted (Lopriore & Muehlhoff 2003a). Generally, undernutrition continues to be one of the main causes of high mortality rates among children under 5 years of age in the sub-region.

The causes of child undernutrition are complex and multidimensional, ranging from factors as fundamental as political instability and slow economic growth to highly specific ones such as infectious diseases (Onis *et al.* 2000). In West Africa, other causes of undernutrition include the agro-ecological and

demographic characteristics of the sub-region (Lopriore & Muehlhoff 2003a). Past studies (Dewey & Brown 2003; Daelmans *et al*. 2009; Lutter *et al*. 2011) have shown that poor infant and young child feeding (IYCF) practices are significant contributing factors to undernutrition globally. Efforts geared at improving complementary feeding (CF) practices are among the globally recommended core package of direct nutrition interventions (Bhutta *et al*. 2008; Bezanson & Isenman 2010).

There have been global efforts to combat the problem of inappropriate CF practices among children in the developing world. One such effort comes from a unique movement known as *SUN* (Scaling Up Nutrition) (Nutrition 2010). SUN is founded on the principle that all people have the right to food and good nutrition. It unites people – from governments, civil society, the United Nations, donors, businesses and researchers – in a collective effort to improve nutrition. All the countries surveyed in this study belong to this movement. Findings from the papers included in this supplement could be of help to such a movement in implementing interventions to minimise or eradicate the crisis of inappropriate CF practices among children in West Africa.

The studies presented in this current supplement have systematically unpacked the status of CF practices among children in most West African countries through the use of nationally representative data sets and the determinants of these practices. The aim of this paper was to review findings from this supplement and to consider the implications for future policy and practice arising from this work. The first paper in this supplement compared CF practices among children aged 6–23 months between the anglophone countries and their francophone counterparts (Issaka *et al*. 2015c). The second paper examined the determinants of suboptimal CF practices among children aged 6–23 months in four anglophone West African countries, namely Ghana, Liberia, Nigeria and Sierra Leone (Issaka *et al*. 2015a). The third paper presented a similar review of these practices in seven francophone West African countries (Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Niger and Senegal) (Issaka *et al*. 2015b). Overall, the analyses in the supplement compare and summarise national findings from these countries regarding the four primary indicators of CF: introduction of solid, semi-solid or soft foods among children aged 6–8 months; minimum dietary diversity; minimum meal frequency; and minimum acceptable diet.

As noted, the first paper in the supplement analysed the status of the CF indicators and provided useful comparisons of the CF indicators across the sub-region. The rates of introduction of solid, semi-solid or soft foods were above average among all four countries. The rates ranged between 73% (Ghana) and 55% (Liberia). The rates of this indicator among the seven francophone countries showed a wider range: from low levels in Mali (30%) to moderately high levels in Senegal (66%). The process of introducing complementary foods to the child is gradual in some situations, taking several months until the infant is finally introduced to family foods. In other contexts the commencement of CF is abrupt and the infant is introduced very directly into the family menu. This often creates difficulties as the child may not be able to eat enough of the adult diet to meet their nutri-

Key messages

- Policy makers should support intervention strategies geared towards improving mothers' knowledge, beliefs and confidence about complementary feeding practices in West Africa.
- Some poor West African families are unlikely to be able to adopt some World Health Organization-recommended complementary feeding practices.
- Complementary feeding practices, particularly dietary diversity, meal frequency and acceptable diet, were notably deficient in the youngest age bracket in West Africa.
- It would be useful to produce books of recipes for complementary foods of high-nutrient density using locally available foods and properly distribute to mothers who are literate and live in urban areas.
- Variety of children's foods should be improved.

tional needs. Using the World Health Organization (WHO) recommendations as a benchmark, children in West Africa may not receive complementary foods at the right age: either they receive them too early (before 4 months) or too late (after 8 months). There is evidence in the past literature that cites Benin as a country where CF is introduced too early and Cote d'Ivoire as one where CF is introduced too late (Lopriore & Muehlhoff 2003b) Although the majority of mothers begin CF at the age of 3–4 months, a few begin within the first 2 months of the infant's life (Lopriore & Muehlhoff 2003b). This may account for the relatively low prevalence of timely introduction of solid, semi-solid or soft foods in these West African countries.

The prevalence of the other CF indicators (minimum dietary diversity, minimum meal frequency and minimum acceptable diet) in all the countries was poor, with rates ranging from an extremely low proportion of children who meet the indicator cut-offs for minimum acceptable diet (3% in Burkina Faso and Mali) to an average proportion of children who achieved minimum dietary diversity (47% in Ghana).

CF practices and food sources

Globally, a baby's first solid food varies from culture to culture. In many cultures, this first complementary food comes in the form of pastes of grain and liquids. In China and other East Asian countries, babies are started on rice porridge called *xifan*. They then move to mashed fruits, soft vegetables, *tofu* and fish (Uvere & Ene-Obong 2013). In West Africa, the first solid food often given to young children is cereal porridge (Barrett 2004). This first complementary food has different names, depending on the type of cereal and the West African country concerned. In Ghana, it is made from fermented maize and is known as *koko* (Pelto & Armar-Klemesu 2011).

Other staple foods on the family menu are given to the child after a successful introduction of cereal gruel. Most of these foods belong to the 'grains, roots and tubers' group. These foods include yam, rice, cassava and cocoyam, and may be eaten with either soup or sauce. It is usually made easier for the child by mashing, thinning or pre-chewing the food. In most communities, low-income families do not make any effort to prepare separate food for children. The child is given modified or unmodified portions of food directly from the family pot once he or she begins to master the art of chewing (Anoshirike *et al*. 2014).

The traditional complementary foods in West Africa mentioned earlier are known to be of low nutritional value (Victor *et al*. 2014). These foods are mainly from the grains, roots and tubers group, which are often rich in carbohydrates but low in protein and energy density. One major problem of the traditional West African complementary foods is their bulky nature (Oniang O *et al*. 2003). It is normally possible to achieve an adequate protein–energy intake among adults and older children by increasing the daily consumption of starchy foods having low nutrient density. For infants and young children, however, the volume of these traditional diets required to meet their energy needs may be too large for them to ingest (Lartey 2008).

Due to the fact that traditional West African complementary foods lack the required nutrients, the requirements for the other three CF indicators cannot be met. This is because the foods lack nutritional diversity and frequency. Consequently, these foods would lack dietary acceptability (the fourth CF indicator) as minimum acceptable diet incorporates both minimum dietary diversity as well as minimum meal frequency. These observations are justified with the findings of low prevalence of minimum dietary diversity, minimum meal frequency and minimum acceptable diet among children aged 6–23 months in these West African countries.

Factors limiting CF

The analyses of predictors of suboptimal CF among children aged 6–8 months in anglophone and francophone countries, as discussed in the second and third papers, respectively, provided critical insights for further research and interventions. The analyses found low/no maternal education and household poverty to be predictors of suboptimal CF practices in West Africa, although these findings were not uniform across all of the countries studied. A mother who is educated is more likely to have better access to

information and health care, and also access to more household resources, compared with an uneducated mother (Guldan *et al*. 1993). An educated mother is likely to be in paid employment. On the other hand, such mothers may leave their infants in the care of maids who may usually be ignorant and inexperienced and sometimes unhygienic in handling food intended for the infant. Mothers from poor households typically do not have adequate resources to provide their children with foods of the required nutritional value. A past study reported that the main limiting factor for providing children with nutritious complementary foods is the limited opportunities to access such foods (Dang *et al*. 2005). Other studies have also found that improved household wealth has a significant effect on adequate CF practices (Vaahtera *et al*. 2001; Faber 2005; Joshi *et al*. 2012; Kabir *et al*. 2012; Ng *et al*. 2012; Patel *et al*. 2012).

Lack of antenatal care visits and access to media were also found to be predictors of suboptimal CF practices. The finding about the lack of antenatal care visits was consistent with a recent study (Victor *et al*. 2014). Mothers who attend antenatal care clinics are likely to come in contact with health workers who may educate them on good CF practices. Previous studies are consistent with our finding about access to the media being a predictor to optimal CF practices (Joshi *et al*. 2012; Patel *et al*. 2012; Victor *et al*. 2014). These findings suggest that mass media such as television, radio and newspapers/magazines can be used as an effective tool for promoting appropriate CF practices.

Intervention strategies

The findings relating to maternal education, antenatal clinic visits and access to mass media support the need for intervention strategies geared towards improving mothers' knowledge, beliefs and confidence about CF practices. The related finding that household poverty is a risk factor to optimal CF also suggests that poor West African families are unlikely to be able to adopt some WHO-recommended CF practices, e.g. in feeding animal-sourced foods (Saha *et al*. 2008). The analyses also shed light on problems with CF among children in the lowest age bracket (6–11 months). CF practices were notably deficient in this age range, particularly dietary diversity, meal frequency and acceptable diet. Alarmingly, this is also the period of the greatest growth faltering, both in West Africa and globally (Victora *et al*. 2010). This finding is therefore relevant in assessing the risk of growth faltering among babies in West Africa.

Another important finding of these analyses is the variability within countries. Although some of the risk factors for optimum CF practices were common to some of the countries, certain factors were unique to particular countries. This variability could be a consequence of economic, cultural, social and/or agro-ecological differences (Menon 2012), each of which can have an effect on CF. In almost all the countries studied, regional diversity within country was a risk factor to optimal CF practices. Interventions to improve CF based on robust formative research, adapted to suit local environments are supported by the significance of this finding.

Way forward

Given the issues identified across these studies, what is the way forward in improving CF practices in the West Africa region? In the past, organisations such as the Food and Agriculture Organization have placed emphasis on increasing the availability of staple foods to meet the energy requirements of undernourished children. Because CF practices in this sub-region are suboptimal, greater attention should be paid to the production of foods that add variety to children's diet, so as to meet their protein, micronutrients and energy needs. Other issues to consider are improvement of the quality of traditional foods given to children, provision of nutrition education, ensuring household food security and improvement of mothers' income-generating activities.

Another way of enhancing the nutritional value of complementary foods is by the process of fermentation. As a result of microbial activity, fermentation increases protein content of these foods (Thaoge *et al*. 2003). A past study has found that the digestibility, protein efficiency ratio, net protein utilisation and biological value were much higher in fermented beans than in uncooked ones (Hong *et al*. 2004). The

high bulk of traditional West African complementary foods can be reduced by the process of fermentation that reduces the viscosity of the cereal gruel (Helland *et al*. 2002).

One of the most important challenges facing West African countries is widespread chronic undernutrition and its accompanying deficiencies in micronutrients that affect the well-being and health of children. As in other African countries, the staple foods in West Africa are mostly grains, roots and tubers (Vaahtera *et al*. 2001; Faber 2005; Macharia-Mutie *et al*. 2010; Victor *et al*. 2014) that lack nutrients. Therefore, a major challenge exists in improving the quality of children's diets. A major strategy in doing so is to increase the variety of children's foods, e.g. vitamin A-rich fruits and vegetables, legumes and nuts, foods of animal origin such as dairy products, fish and meat and indigenous wild foods. One major impediment, however, is the ability to produce food in large quantities and of different varieties to ensure that children have secure access to food that is sufficient, safe and nutritious throughout the year, especially in the Sahel countries such as Mali and Niger (Lopriore & Muehlhoff 2003b).

According to a past study (Quisumbing Agnes & Meinzen-Dick 2001), empowering women, who play the most important role as producers of food, is key to achieving food security. This fact has been highlighted in a recent review on the current knowledge of the relationship between maternal autonomy and the nutritional status of children and child feeding practices (Carlson *et al*. 2014). As such, policy considerations regarding CF practices and household food security must consider the occupational and socioeconomic status of West African mothers, and factors that can improve their food-related resources and purchasing power. In addition, if the work load of these mothers could be reduced, they may have greater time and incentive to prepare nutritious complementary foods for their children. Recipe books detailing the use of locally available, high-nutrient produce could be distributed to mothers who are literate and live in urban areas, while nutrition counselling and demonstrations may better suit mothers who are illiterate and reside in rural areas. Financial support for CF practices could also be developed through income-generating ventures for mothers, such as successful 'micro-loan' schemes for small business development (Babajide 2012).

Food taboos and ignorance in West African countries may also give rise to poor quality complementary foods. This similarly calls for child food and nutrition education. Effective education formats of this kind would also be important for combating diet-related diseases among children in these countries. Nutrition education and training of mothers and caregivers is needed to improve CF practices and can potentially be incorporated into primary health care programmes. Rural mothers can be educated by nutritionists and other health workers about the importance of appropriate CF practices, infant health, varying a child's diet and practising good hygiene in food handling and storage. One study in Pakistan found that a nutrition intervention education programme led to a reduction in undernutrition in food insecure households (Zahid Khan *et al*. 2013). In the same way, the teaching of rural mothers can have a long-term effect on CF practices and nutritional status of West African children.

Effective child nutrition strategies should be put in place in order to achieve the goal of optimum CF practices. One major problem is whether there are delivery strategies that contain known efficacious interventions to improve IYCF practices in West Africa and whether these strategies are reaching communities, households and mothers in these countries. IYCF practices delivery modes may include home visits by health care workers, antenatal and postnatal clinic visits by mothers and the media.

Key policy strategies

Based on our recent review of national data regarding CF practices in West Africa, along with developments in the wider literature, we propose the following strategies that may enhance policies and practices of CF in West Africa.

1. There should be adequate linkage and coordination arrangements in order to eliminate limits on the implementation and sustainability of child nutrition policies.

2. Governments should commit to international child nutrition conventions and declarations in order to facilitate pursuance of nutrition policies and programmes. Encouragingly, governments of all the countries surveyed are already doing this through the SUN movement (Nutrition 2010).
3. Greater attention needs to be given to the role of research and evidence-based training in child nutrition policy formulation and implementation. This could prevent missed opportunities in adopting strategies to optimise complimentary feeding programmes and practice.
4. There should be a coherent national child nutrition policy in all the countries in West Africa. This should (1) outline a framework for pursuing child nutrition interventions at the national, regional and district levels; (2) define institutional roles and responsibilities; (3) stipulate monitoring and evaluation processes; and (4) articulate linkage and coordination arrangements. The absence of a national policy may limit the extent to which pressure can be brought to bear on governments to provide resources for sustained implementation of IYCF programmes.
5. There should be adequate dissemination of child nutrition information. Data and findings from the various demographic and health surveys profiles should be systematically disseminated beyond national and regional levels. This could lead to adequate understanding and appreciation of child nutrition policy issues and actions at the district and community levels.
6. Health sector interventions in each country should not be only clinical and curative in nature, but they should include education of mothers and caregivers so as not to limit the scope and scale of child nutrition interventions.

To conclude, analyses performed in this series add to the extant literature on child nutrition in the West African region. The analyses have revealed the significant socio-demographic factors that contribute to child undernutrition and also exposed the problem of suboptimal CF in the sub-region. They charge researchers in the region to mobilise and generate evidence on effective macrostrategies to address this problem. They also challenge policy makers and programme planners to mobilise, scale up and sustain effective strategies towards optimal child nutrition.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Contributions

A.I.I. designed the study, performed the analysis and prepared the manuscript; K.E.A. provided advice on the study design and data analysis. P.L.B., A.N.P., G.J.S. and M.J.D. provided revision of the final manuscript. All authors read and approved the manuscript.

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