

Policy Brief: Priority areas for reducing stunting in South Africa

Examining the implications of recent international evidence

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In South Africa, one in four children under the age of five are stunted (NDoH, Stats SA, SAMRC & ICF, 2019). Despite being a higher middle income country, South Africa ranks as one of the 34 countries accounting for 90% of the world's stunted children — alongside some of the poorest countries in the world (Galasso & Wagstaff, 2019).



Main highlights

- Among children under five in South Africa, one in four are stunted.
- Beyond impeding child development, including cognitive development, stunting can have major negative social impacts with intergenerational consequences for family well-being.
- Addressing stunting requires tackling its four main direct causes: inadequate dietary intake, repeated infections, social and cognitive under-stimulation, and air pollution.
- Efforts to address stunting could yield significant social and economic returns.
- For children aged 6-24 months, in the complementary feeding age group, international evidence supports two sets of stunting interventions for the short to medium term:
 - Nutrition education for caregivers and the wider community, with a focus on appropriate complementary feeding practices
 - The promotion of a preventative Lipid-Based Nutrient Supplement in Small Quantity (LNS-SQ) for at-risk young children
- More research is needed locally and internationally on how to tackle the multiple and complex causes of stunting.
- The main way to reach children aged 6-24 months in South Africa with stunting interventions – particularly nutrition related - is via the network of primary health care clinics. But nutrition and educational interventions offered via Early Childhood Care and Education (ECCE) programmes could significantly augment efforts, especially around nutrition education.
- Routine data on breastfeeding, vitamin deficiencies, wasting, underweight and stunting is urgently needed to assess whether the recommended nutrition strategies are working and having the envisaged widespread impact on child growth and development.
- Beyond nutrition-specific interventions, more research is needed on how interventions to limit repeated infections, social and cognitive under-stimulation, and air pollution could alleviate stunting issues.

What is stunting?

The term 'stunting' refers to children being short for their age when their height is more than two standard deviations below the World Health Organisation (WHO) Child Growth Standard's median height for children of their age and gender.

But the problem encompasses much more than simply short stature. Identified by low height-for-age, stunting is a significant indicator of child development more broadly including cognitive and social development (Prendergast & Humphrey, 2014). We can think of stunting intuitively as a measure of unfulfilled or unrealised potential (Black, et al., 2013; Hoddinott, et al., 2013).

Aims of this policy brief

Due to the large and significant impact of stunting, and the lack of progress in reducing stunting in South Africa, we undertook a review of the evidence of stunting interventions. This policy brief summarises the key findings in the review focused on **complementary feeding interventions for children aged 6 - 24 months**. This age group falls within the crucial and highly sensitive first 1000-day period - a challenging feeding transition where breastmilk alone is no longer enough to sustain the child from six months onwards. Many caregivers struggle to introduce other foods in their children's diets because the food available is inadequate in quantity, nutritional quality and variety. In low and middle-income countries (LMICs) this complementary feeding age is the period when stunting is most likely to occur. Stunting is difficult to reverse after the age of two (Dewey & Adu-Afarwuah, 2008).

The review drew heavily on the two most recent Lancet Maternal and Child Nutrition series, published in 2013 and 2021. Because the focus of these two Lancet series is on reviewing evidence for policy-making and resource prioritisation, they exclude studies that have shortcomings that could bias results or lead to inaccurate impact estimates. We examined what the Lancet series evidence means for South Africa, thinking through our fiscal and social contexts and the operational demands of recommended interventions that can interfere with effective and feasible policy and programme implementation at scale. Due to concerns about decreased food security following Covid-19 related job losses and increases in food prices, there is an increasing urgency to address stunting. We therefore focus our attention on short to medium term solutions.

Main causes of stunting

Stunting has four main direct causes: inadequate dietary intake, repeated infections, social and cognitive under-stimulation, and air pollution. Yet there is little high-quality evidence on the stunting impact of interventions to reduce air pollution. Interventions to decrease stunting by preventing repeated infections have been disappointing, possibly due to the influence of environmental enteric dysfunction, which requires a community-wide intervention. Additionally, the impact of social and cognitive stimulation interventions on stunting is usually assessed as an 'add-on' to a nutrition intervention so it cannot be compared directly to stand-alone interventions. For these reasons, this review focuses more on nutrition-specific interventions.

Why addressing stunting matters

Stunting matters for at least three related reasons:

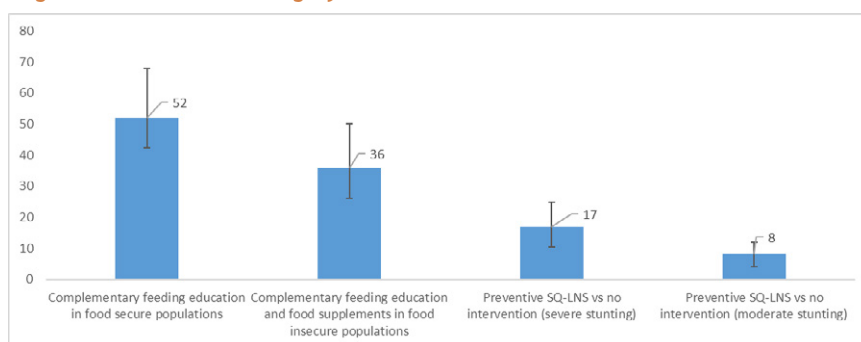
- a. **It has a substantial and enduring social impact.** Growth deficits occurring at a young age tend to have a long-term impact on cognitive and social development. This in turn affects labour market prospects and earnings as an adult (Almond, Currie & Duque, 2018; McGovern et al., 2017).
- b. **The impact of stunting is long-term and without intervention can become intergenerational.** A premature or low birthweight baby born of a malnourished mother has a higher risk of dying in infancy. If the baby survives, there is a risk of developmental and health problems throughout childhood and into adult life. Undernutrition has been described as one of key mechanisms by which poverty – and its consequences – are transmitted intergenerationally (Nisbett, et al., 2014).
- c. **Stunting has relevance for inequality and social justice.** It can function as a poverty trap, further entrenching patterns of vulnerability and privilege.

Short to medium term interventions that work for stunting

Based on the review of the evidence, there is evidence to support two sets of stunting interventions for the complementary feeding age group for the short to medium term:

- a. **Nutrition education for caregivers and the wider community**, with a focus on appropriate complementary feeding practices.
 - Nutrition education is supported by systematic reviews and meta-analyses – as shown in Figure 1.
 - Based on the updated Paediatric Food-based Dietary Guidelines (PFBDGs) (Du Plessis et al, 2021) as well as recent research on the local accessibility and affordability of foods that will address nutrient deficiencies for South African children of this age group (Ryckman et al., 2021), the following summary feeding advice is suggested:
 - Caregivers are advised to feed children 6-24 months with breastmilk complemented with the following foods:
 - meat or chicken or fish or egg or beans or peanut butter every day, or as often as possible;
 - dark-green leafy vegetables (e.g. spinach and other indigenous green leaves) and orange-coloured vegetables and fruit (e.g. carrot, tomato, pumpkin, orange-flesh sweet potato, apricot, mango) every day;
 - either milk or maas or plain, unsweetened yoghurt every day.

Figure 1: Percentage reduction in stunting by nutrition interventions

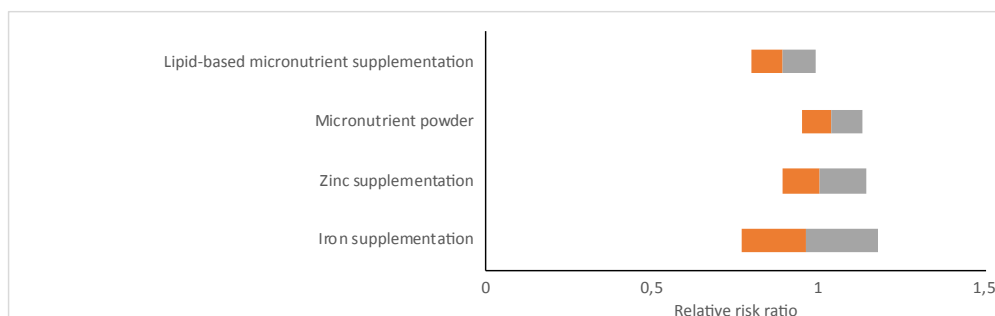


Source: Table 2 in Keats et al.(2021). The preventative SQ-LNS estimates are from Das, et al. (2019). The two impact estimates for complementary feeding education are from Lassi, et al. (2020).

- b. Providing preventative **Small Quantity Lipid Nutrient Supplement (SQ-LNS)** for at-risk children aged 6-24 months.
 - The promotion of SQ-LNS is supported by strong evidence, including systematic reviews and meta-analyses summarised in Figures 1 and 2. Figure 2 shows the relative risk estimates from meta-analyses of different types of interventions, comparing the probability of the outcome occurring for the treatment against the control group, thus the interpretation is with respect to 1, which represents no difference between the relative risk of the intervention and control group. The greater the distance from one, the larger the effect. Figure 1 shows that SQ-LNS has a substantial impact on stunting, while micronutrient powder, iron supplementation and zinc supplementation as single interventions did not.
 - Contrary to other supplements, SW-LNS also provides essential fatty acids, protein and energy.
 - SQ-LNS has been designed to be used as a preventative stunting intervention for at-risk groups of young children. However, it should be distinguished from other ready-to-use therapeutic food products targeting severely malnourished or wasted children.
 - SQ-LNS is a relatively new product and has not yet been included in WHO guidelines. However, South African studies have shown that LNS is acceptable and that it has an impact on child growth outcomes (Rothman, et al., 2015; Smuts, et al., 2019). SQ-LNS has been designed to prevent malnutrition and stunting and its application therefore calls for the targeting of a subpopulation of children considered to be at high risk of stunting.
 - This is a cost-effective strategy for reducing stunting. A recent study in Niger estimated that the incremental cost for supplying one child aged 6-23 months with SQ-LNS for a year was 30 US dollars (Hiebert et al., 2021).



Figure 2: Meta-analyses for efficacy of nutritional supplements vs control on relative risk of stunting among children under five in LMICs



Source: Tam et al. (2020). These estimates are for efficacy, which means that they compare the control group to those who adhered to the treatment protocol, i.e. those who took the supplements. This would be in contrast to effectiveness study where all those who were allocated to the treatment group would be included in the control/comparison group. The meeting point between the orange and grey is the median and the orange and grey bars represents the lower and upper confidence intervals.

Cost-effectiveness of nutrition interventions

Our recommended interventions for reducing stunting incidence among the complementary feeding age, overlap with many of the strategies included in a 2013 Lancet Maternal and Child Nutrition series review (Bhutta et al., 2013). However, the Lancet review strategies are not specific to the complementary feeding age group and are not tightly concentrated around efficacy in reducing stunting. Nevertheless, the package of 10 interventions (Box 1) are highly relevant in the promotion of early childhood development outcomes.

Box 1: Package of ten evidence-based nutrition interventions recommended by Bhutta et al. (2013)

- folic acid supplementation in pregnancy
- multiple micronutrient supplementation in pregnancy including iron-folate
- calcium supplementation in pregnancy
- energy-protein supplementation in pregnancy
- breastfeeding promotion
- vitamin A supplementation in childhood
- zinc supplementation in childhood
- complementary feeding education
- complementary food supplementation and
- severe acute malnutrition management

Albeit strong assumptions made, cost-benefit analyses by Galasso & Wagstaff (2019) and Desmond et al. (2021) substantially strengthen the case in support of investing in the package of ten nutritional interventions (Bhutta et al., 2013). This also implies that addressing stunting could yield significant social and economic returns for South Africa.

Investing in the package of 10 nutritional interventions yields significant social returns and improves per capita income. Galasso and Wagstaff (2019) estimated the expected economic value and the costs associated with scaling up the Bhutta et al. (2013) package of interventions over a period of 10 years in the 34 countries (including South Africa). The estimated rate of return to the investment in the package was 12% and the cost-benefit ratio ranged from 1:5 to 1:6. They found that, without childhood stunting of the workforce, the per capita income of the countries would have been between 5-7% higher.

Desmond et al. (2021) estimated the cost-benefit of scaling up the 2013 package of nutrition interventions to 90% coverage for a 2021 cohort of South African children. To capture the role of context, they estimated benefits with and without additional improvements in school quality and employment opportunities by socioeconomic

quintile. They found that scaling up the package reduced national stunting rates among two-year olds by 3.18 percentage points. The estimated cost of scaling up was US\$90 million (R1.4bn) and the present value of additional years of schooling was approximately US\$2 billion (R31bn). They found that, overall, a US\$1 investment in these interventions returned US\$18 in productivity in South Africa.

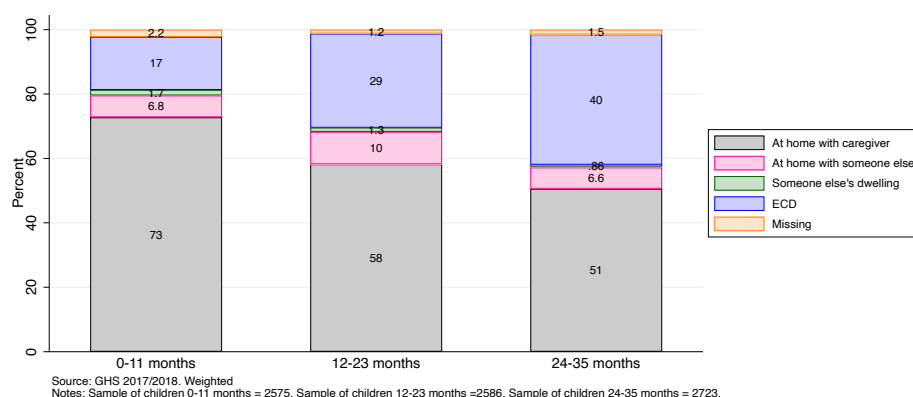
Complementary feeding education has been included in the 2013 package of recommended interventions, but the inclusion of SQ-LNS is new to the 2021 updated review. There have therefore not yet been costing estimates for the updated 2021 package of recommended interventions.

Role of ECCE programmes in addressing stunting

The main way to reach children aged 6-24 months in South Africa is via the network of primary health care clinics. However, patchy logistics, poor ICT infrastructure, a shortage of managerial skills, weak coordination and a shortage of trained nutritionists remain challenges for any national initiative delivered via a network of clinics. Against this background, could ECCE programmes play a supporting role in the fight against stunting? There are three compelling arguments in favour of such a role for the ECCE sector:

- Since stunting is a multi-dimensional problem, it would be appropriate to consider **cross-departmental collaboration**.
- Community-based approaches, such as community health worker home visits and mother-to-mother peer groups, can help widen and deepen the reach of efforts to scale up nutrition interventions** (Heidkamp et al., 2021). ECCE networks could plausibly fulfil a similar function: serving as a community base to encourage deeper community responsiveness and easier access.
- Partnership between ECCEs and public clinics in the fight against stunting could create synergistic coverage**. Public clinics have close to universal coverage of young children receiving immunisations, but coverage declines thereafter. By contrast, household surveys show that ECCE institutions' coverage is initially low but then rises with age, reaching almost 80% coverage when children are four and five years old (see Figure 3). ECCEs can make a direct contribution to improving nutrition and combating hunger and stunting via the food they provide to children under their care, and also via social and cognitive stimulation. However, for a large share of children who only start attending these institutions when they are older, this will be too late. ECCEs also have a potential additional role as a champion and a promoter of improved feeding and nutrition knowledge. Such a broader role for ECCE programmes would be in line with what the National Development Plan envisaged for the sector (NDP 2011:300).

Figure 3: Childcare arrangements during the day, children aged 0–35 months



Note: A very broad definition is used to measure ECCE access here for young groups. If respondents said yes to any of the following the child is considered to be attending ECCE: Grade R, pre-school or nursery school or Grade 00 or Grade 000, crèche or educare centre, or day-mother or 'gogo' or childminder, home or community playgroup, other (specify), school.

Supporting policies and reforms to complement stunting interventions

Since the review paper prioritised *evidence* on stunting, the focus falls overwhelmingly on interventions that are amenable to impact assessment. Despite being more difficult to measure the impact of larger supporting policies, we acknowledge the important contribution of policies such as

- a. post-pandemic social security reform,
- b. health care reform,
- c. improved service delivery (with a focus on water, sanitation and hygiene (WASH)),
- d. the necessary regulation to curtail advertisements that promote unhealthy foods for young children and
- e. programmes and policies that promote access to nutritious food and optimise the nutrient content of food.

We note that early childhood care or educational (ECCE) programmes have an important role to play in supporting the last two policies – both directly, through social and cognitive stimulation and better feeding, and potentially indirectly, by serving as champions, promoters and community-based contact points for complementary feeding education and nutritional supplements.

Further research and data required to improve stunting interventions

Very little research has been done on stunting, despite the seriousness of the problem (Casale et al., 2018). More research and better data could also help researchers to understand better the causes and identify solutions to this crisis.

- Beyond nutrition-specific interventions, **more research is needed on interventions** to limit repeated infections, social and cognitive under-stimulation, and air pollution could alleviate stunting issues.
- We urgently need **routine data** on breastfeeding, vitamin and mineral deficiencies, wasting, underweight and stunting to assess whether the recommended nutrition strategies are working and having the envisaged widespread impact on child growth and development. Easier and more rapid access to routine data can help government and NPO partners to identify and remove implementation glitches at an earlier stage, facilitating a greater responsiveness to community needs and better alignment to the vision of improving lives and reducing stunting. Such data can help boost implementation research on how to deliver evidence-based nutrition interventions at scale (Heidkamp et al., 2021).
- Routine data collection should occur alongside **more regular nutrition surveys**, and more **routine checks of nutritional deficiencies and child growth**.
- **Digitising of the Road to Health booklet information** should be a feasible and important step towards routine data collection but should not come at the expense of retaining physical Road to Health Booklets that enable mothers to track their children's growth and engage with the included educational material.

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