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# Stunting

What (more) must we do about it in  
South Africa?

# Introduction

- An essential question is what countries should do to reduce stunting in their populations
- What inputs are required, and where and when should they be invested for highest returns?
- The broad spectrum of causal influences on stunting and their impact – through the mother as well as directly on the child – makes it extremely challenging to model expected returns from individual interventions to inform such decisions.
- Evidence from large-scale, focused stunting reduction programs is scarce and decisions must therefore rely on what is biologically plausible and evidence from research trials.

# What is stunting?

- Length/height for age less than two standard deviations of the WHO Child Growth Standards median

# Impact

- Greater risk for illness and premature death
- Delayed mental development
  - poorer school performance
  - reduced productivity in the work force
- Reduced cognitive capacity
- Greater propensity for developing adult obesity and chronic diseases
- Women of shorter stature
  - greater risk for complications during child birth
  - risk of delivering a baby with low birth weight
- Stunted growth can be passed on to the next generation

# Why does stunting matter?

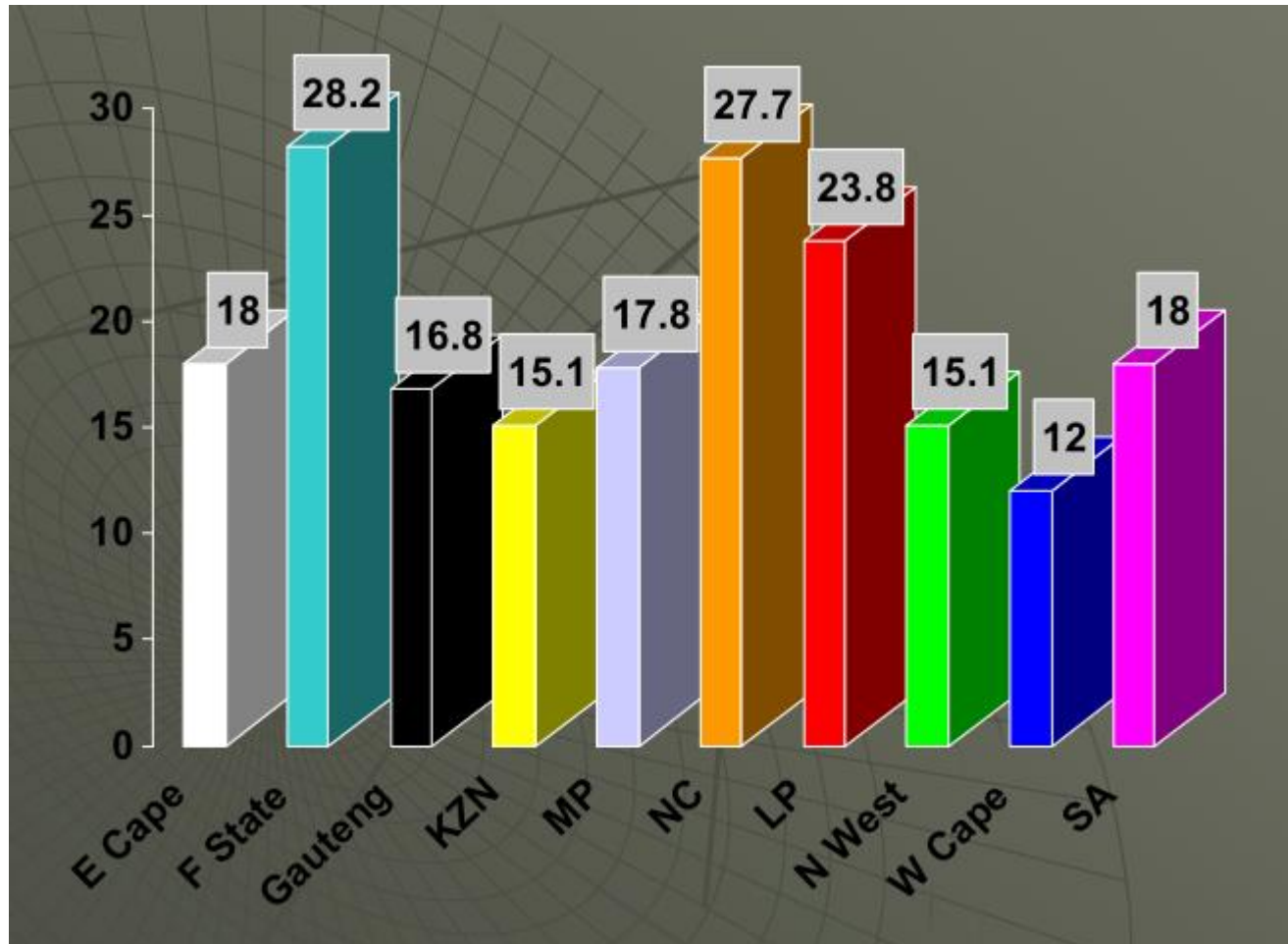
- Decreased maternal and childhood morbidity and mortality
- Improved cognition, growth, and neurodevelopmental outcomes
- Increased work capacity and productivity
- Economic development

- Nutrient deficiencies can affect neuroanatomy, neurochemistry and neurophysiology, with potentially long-term changes in form and function occurring if the deficiency changes the trajectory of brain development beyond a period when repair can occur (Georgieff 2007).

# Why Bafana won't win the World Cup

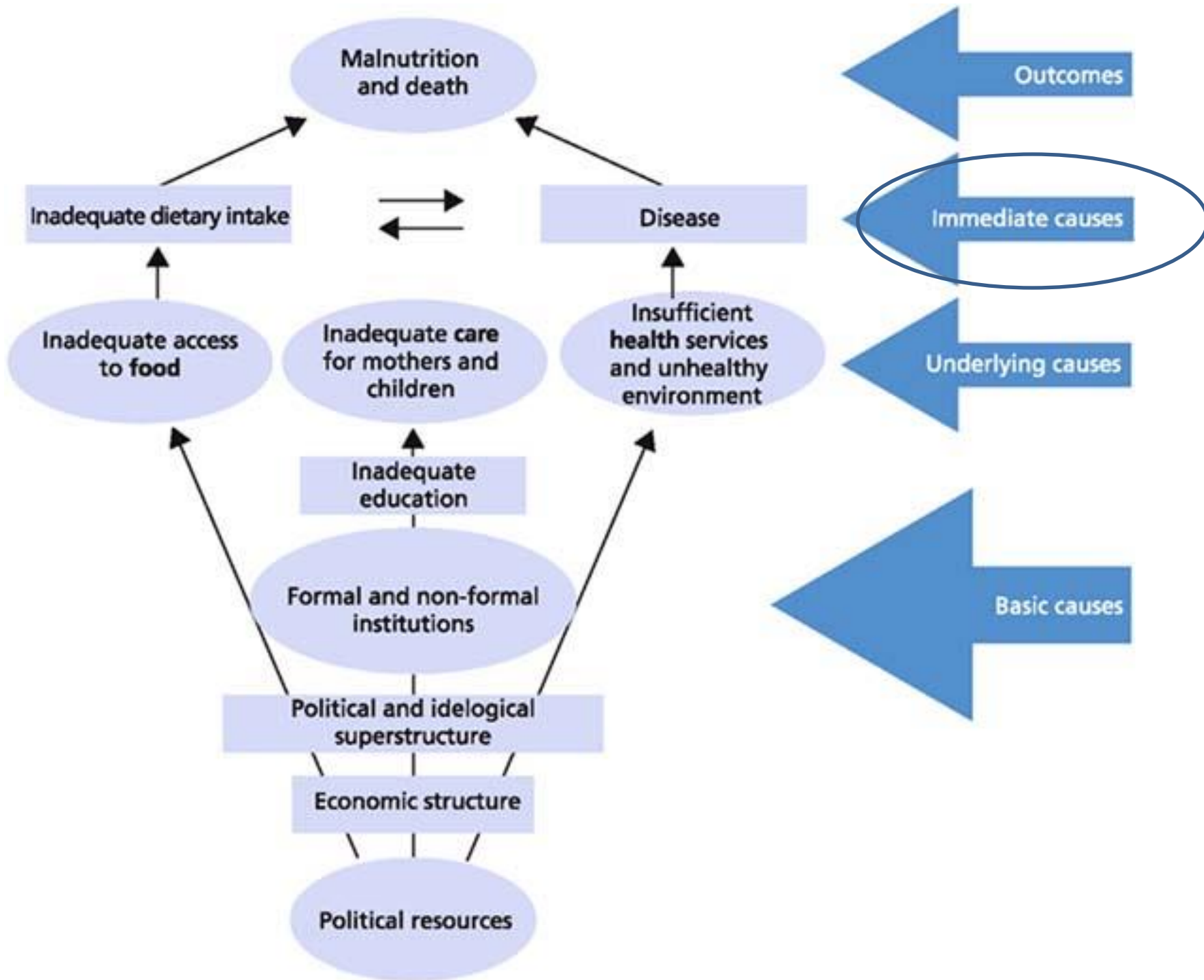


# How big a problem is stunting in SA?





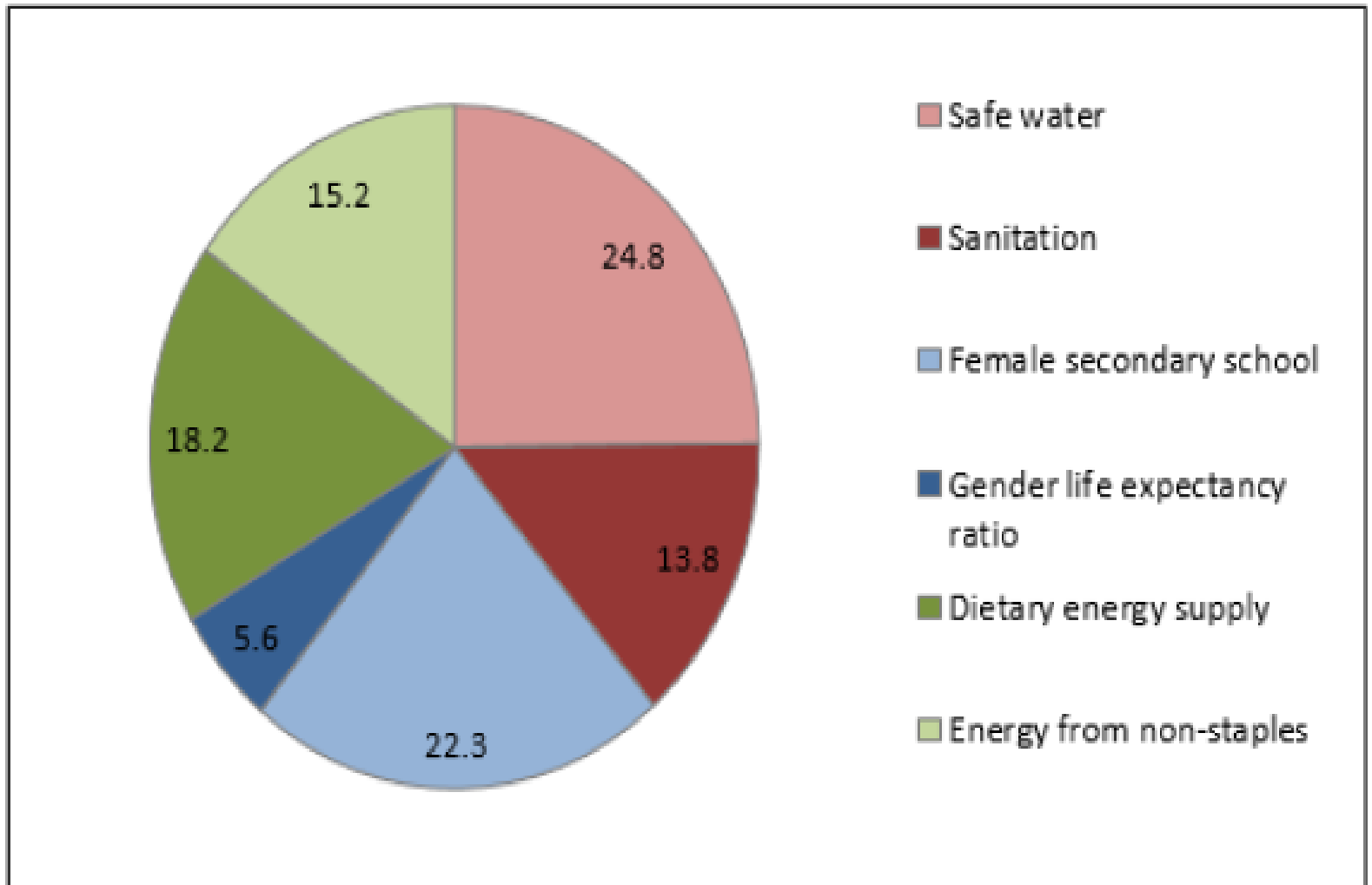
Why do children get stunted?



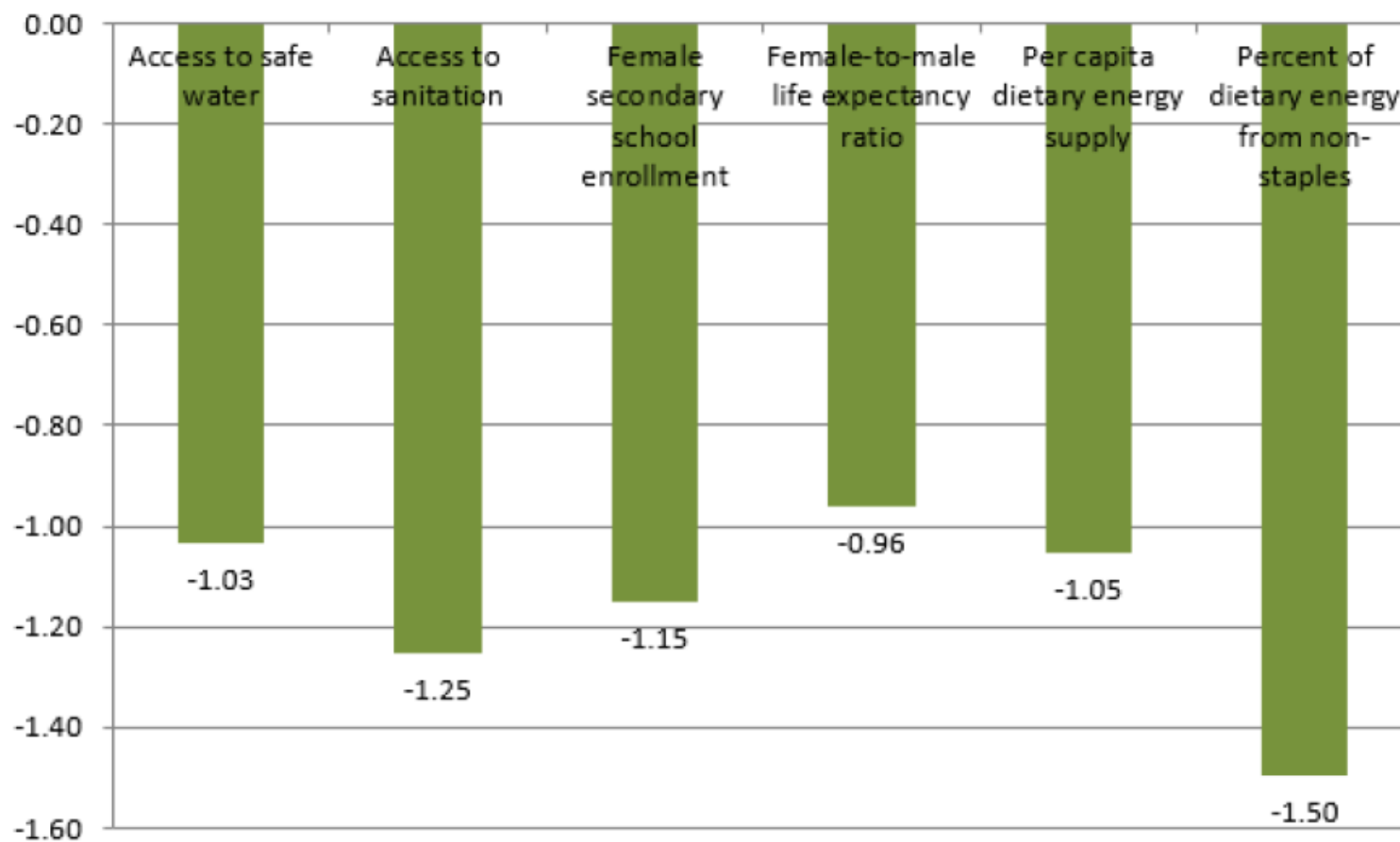
# So, what are the options?

- Nutrition-specific interventions directly address the immediate causes of child undernutrition, that is, inadequate dietary intake and poor health status
- Nutrition sensitive- address the underlying causes through programs with links to nutrition such as agriculture, food systems, early childhood development, schooling, social protection, and safety nets
- Address basic causes

**Figure 3b. Contributions of underlying determinants to total estimated reductions in stunting, 1970-2010 (percent)**

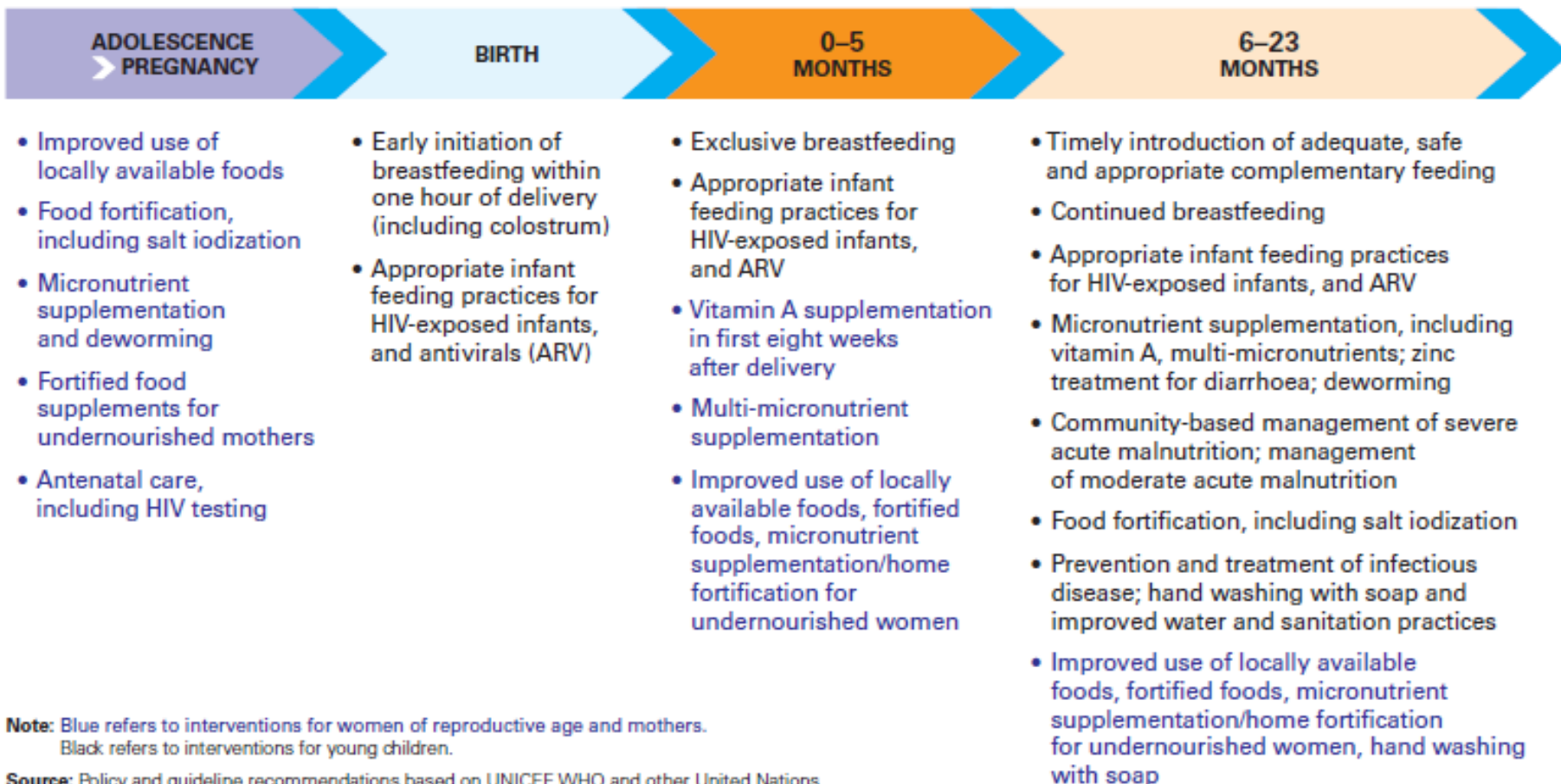


**Figure 2. Estimated reduction in prevalence of stunting due to a 10 percentage-point increase in determinant over its range**



Smith and Haddard, 2014

**FIGURE 18** Key proven practices, services and policy interventions for the prevention and treatment of stunting and other forms of undernutrition throughout the life cycle



**Note:** Blue refers to interventions for women of reproductive age and mothers.  
Black refers to interventions for young children.

**Source:** Policy and guideline recommendations based on UNICEF, WHO and other United Nations agencies, Bhutta, Zulfiqar A., et al., 'Maternal and Child Undernutrition 3: What works? Interventions for maternal and child undernutrition and survival', *Lancet*, vol. 371, no. 9610, February 2008, pp. 417-440.



## Maternal and Child Nutrition 2

# Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?

Zulfiqar A Bhutta, Jai K Das, Arjumand Rizvi, Michelle F Gaffey, Neff Walker, Susan Horton, Patrick Webb, Anna Lartey, Robert E Black, The Lancet Nutrition Interventions Review Group, and the Maternal and Child Nutrition Study Group

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Maternal undernutrition contributes to 800 000 neonatal deaths annually through small for gestational age births; stunting, wasting, and micronutrient deficiencies are estimated to underlie nearly 3·1 million child deaths annually. Progress has been made with many interventions implemented at scale and the evidence for effectiveness of nutrition interventions and delivery strategies has grown since *The Lancet Series on Maternal and Child Undernutrition in 2008*. We did a comprehensive update of interventions to address undernutrition and micronutrient deficiencies in

# Maternal nutrition

- **Iron or iron and folic acid supplementation**
- **Maternal multiple micronutrient supplementation** 11–13% reduction in low birth weight and SGA births
- **Addressing maternal wasting and food insecurity with balanced energy and protein supplementation** increased birth weight by 73 g (95% CI 30–117) and reduced risk of SGA by 34%



# Breastfeeding

## WHO recommends

- initiation of breastfeeding within 1 h of birth,
  - exclusive breastfeeding of infants till 6 months of age,
  - continued breastfeeding until 2 years of age or older.
- In general, exclusive breastfeeding has a significant impact on infant morbidity and survival, but there is little evidence to date of an impact on stunting based on randomised trials to promote exclusive breastfeeding (Bhutta *et al.* 2008; Black *et al.* 2013).

RESEARCH ARTICLE

Open Access

# Growth effects of exclusive breastfeeding promotion by peer counsellors in sub-Saharan Africa: the cluster-randomised PROMISE EBF trial

Ingunn Marie Stadskleiv Engebretsen<sup>1\*</sup>, Debra Jackson<sup>2</sup>, Lars Thore Fadnes<sup>1,3</sup>, Victoria Nankabirwa<sup>4,5</sup>, Abdoulaye Hama Diallo<sup>6</sup>, Tanya Doherty<sup>2,7</sup>, Carl Lombard<sup>8</sup>, Sonja Swanvelder<sup>8</sup>, Jolly Nankunda<sup>9</sup>, Vundli Ramokolo<sup>1,7</sup>, David Sanders<sup>2</sup>, Henry Wamani<sup>5</sup>, Nicolas Meda<sup>6</sup>, James K Tumwine<sup>9</sup>, Eva-Charlotte Ekström<sup>10</sup>, Philippe Van de Perre<sup>11,12,13</sup>, Chipepo Kankasa<sup>14</sup>, Halvor Sommerfelt<sup>1,15</sup>, Thorkild Tylleskär<sup>1</sup> and on behalf of the PROMISE EBF-study group

Feeding data and anthropometric measurements were collected at visits scheduled 3, 6, 12 and 24 weeks post-partum.

**No statistically significant differences were seen in the prevalence estimates for stunting between arms in any of the countries at any of the visits**

# Complementary feeding

- Complementary feeding for infants refers to the timely introduction of safe and nutritionally rich foods in addition to breast-feeding at about 6 months of age and typically provided from 6 to 23 months of age.

Complementary feeding is a complex set of behaviours, comprising

- timing of introduction
- food choices and dietary diversity
- preparation methods
- quantity
- feeding frequency
- responsiveness to infant cues
- and safe preparation and storage of foods

# Complementary feeding

- Overall, complementary feeding interventions have strong potential for a major impact on stunting, but the evidence to date is mixed (Bhutta *et al.* 2013a).
- The provision of complementary foods in food insecure populations was associated with significant gains in HAZ and WAZ whereas the effect on stunting did not reach statistical significance (RR 0.33, 95% CI 0.11–1.00, seven studies).

# Complementary feeding

- Educational interventions to improve complementary feeding practices are often effective at changing behaviours, but their impact on stunting has been less impressive.
- Increased energy density of complementary foods – mixed results
- Provision of complementary foods or a food product offering extra energy (with or without added micronutrients), alone or in combination with some other strategy such as education for caregivers

# Supplementation

Available options include:

- the provision of multiple micronutrients via supplements,
  - micro-nutrient powders,
  - fortified ready-to-use foods including lipid-based nutrient supplements.
- 
- Micronutrient powders are increasingly in use at scale in programmes to address iron and multiple micronutrient deficiencies in children. Sixteen randomised controlled trials to assess the effectiveness of micronutrient powders - improved haemoglobin concentration and reduced IDA by 57% and retinol deficiency by 21%. No evidence of benefit on linear growth.

# Fortification

- Foods can be fortified at three levels: mass or universal, targeted, and household.
- Biofortification of food crops (fortification of food at source) is rapidly advancing in technology with much success.
- Fortification strategies to increase bioavailability of key nutrients such as iron and zinc for children shows significant benefits on serum micronutrient concentrations, but no evidence of effects on stunting

# IMCI

- In Tanzania, implementation of IMCI was associated with significant improvements stunting in children between 24 and 59 months of age.
- Bangladesh- comparatively faster reduction in the prevalence of stunting in children aged 24–59 months
- Why? Better case management of infections, increased frequency of complementary feeding and possibly improved dietary quality.



# Community interventions

- Although there are examples of community interventions with a positive impact on reducing stunting (Penny *et al.* 2005; Ruel *et al.* 2008), there are few documented examples of successful programs at scale.

# What else?

- Conditional cash transfers - financial incentives have the potential to promote increased coverage of several important child health interventions, but the quality of evidence available was low.

# Development and evaluation of integrated interventions

- Integrated interventions that combine nutrition, infection control (including WASH), and care for mothers and children are likely to have a larger impact on stunting than any of these components alone.
- Such interventions should ideally tackle the entire ‘window of opportunity’, i.e. both the pre- and post-natal periods, but that has not yet been attempted in efficacy or effectiveness trials.

What choices for SA?

# One last point

- Stunting is never permanent

# Conclusion

Nutrition interventions alone are almost certainly insufficient, hence the numerous efforts under way to foster nutrition-sensitive development