**Introduction**

The South Asia region has made remarkable gains in child survival over the past two decades. Child deaths are now concentrated in the neonatal period because of the success in preventing and treating childhood illnesses (UN IGME, 2019; Hug et al., 2019). In comparison, the rate of decline in child malnutrition has been slow. High prevalence rates and burdens persist and the region remains home to over half of the world’s wasted children (25.1 million) and nearly 40% of the global stunting burden (56.1 million) (UNICEF, WHO and World Bank, 2020).

The prevalence of child wasting in the region (14.8%) is just below the World Health Organization (WHO)’s ‘very high’ threshold of 15%. Wasting increases the vulnerability of children to infectious diseases and death and raises the risk of stunting and its associated long-term consequences on development. These risks accumulate with the frequency, duration and severity of wasting episodes (Richard et al., 2014; Schoenbuchner et al., 2019). They are also greater for children who are wasted at birth or in early infancy (Mwangome et al., 2019), a period of life that has received relatively less attention in wasting prevention and treatment efforts.

The South Asia region also has the highest prevalence of low birth weight (LBW) in the world. More than one in four children (27%) have a birth weight of less than 2.5 kg and start their first days small and vulnerable (UNICEF & WHO, 2019). This unacceptably LBW prevalence may explain why child wasting is so widespread in South Asia. Compared to sub-Saharan Africa (the region with the second highest prevalence of LBW and wasting), South Asia has double the prevalence of LBW (14% vs. 27%) and double the prevalence of child wasting (6.9% vs. 14.8%). While such comparisons are simplistic, we believe they help to understand the epidemiology of and solutions to resolving child wasting in South Asia.

LBW can be traced to the poor nutrition and health status of women before and during pregnancy. In this views article, firstly we share evidence as to why maternal nutrition matters in wasting prevention efforts in South Asia and, secondly, we review the response to maternal nutrition in the region and identify the gaps and challenges in ongoing efforts. Lastly, we discuss and conclude the implications of our findings for child wasting prevention efforts in South Asia.

**Why maternal nutrition matters in child wasting prevention in South Asia**

Children are born small either because they are small for gestational age and/or because they are preterm. In South Asia, the proportion of small for gestational age newborns is about three times that of preterm newborns (Lee et al., 2013). Small for gestational age is often the result of intrauterine growth restriction and these newborns are particularly vulnerable to infections, poor linear growth and delayed neurodevelopment (Lee et al., 2017). Early growth failure also predisposes infants to persistent growth failure and increased mortality risks in early childhood (Mertens et al., 2020). Preterm delivery can be caused by poor maternal nutrition including calcium deficiency, iron deficiency and anaemia (Kumar & Kaur, 2017; Rahman et al., 2016).

Women’s nutritional status before and during pregnancy has a profound effect on fetal growth and development as well as the mother’s own health and wellbeing. Over the last two decades, the proportion of women affected by thinness (body mass index <18.5 kg/m2) and short stature (height <145 cm) has fallen in South Asia. However, thinness still affects one in five women in the region, with Bangladesh and India most affected, and one in ten women in the region have a short stature (Figure 1) (Goudet et al., 2018). In addition, overweight and obesity are rapidly rising concerns across all countries in the region, anaemia is a severe or moderate public health problem in seven out of eight countries and a range of micronutrient deficiencies persists in women including deficiencies of iron, zinc, iodine and vitamin A (Goudet et al., 2018; Harding et al., 2018a).

There is a large body of evidence that consistently links poor maternal nutrition and low birth weight (LBW) to child wasting in South Asian countries. Maternal thinness is a predictor of child wasting in Afghanistan, Bangladesh, India, Nepal, the Maldives and rural Pakistan and women who are shorter than 145 cm are also more likely to have wasted children in India and rural Bangladesh (Harding et al., 2018b). Analysis of pooled data from these six South Asian countries found that LBW increases the odds of wasting, severe wasting and concurrent wasting and stunting (Harding et al., 2018c). Maternal thinness and low stature also predict stunting in South Asian countries (Kim et al., 2017).

There are other aspects of women’s health status and lives that also adversely affect birth weight and child nutrition, including maternal infections (e.g., malaria, rubella, syphilis), low maternal education, adolescent pregnancy and short birth spacing (Kozuki et al., 2013a; Kozuki et al., 2013b; Robinson et al., 2000). Harding et al. (2018b) found that children whose mothers are illiterate are more likely to be wasted in India and Nepal but did not examine other maternal factors. Several of these factors reflect women’s low status and capacity to influence...
decisions that affect their wellbeing and health and that of their children – at what age to marry and have a first child, authority to access to healthcare, whether to take contraception and decisions regarding what food is purchased and consumed by women.

In South Asia, women’s status (i.e., their power relative to men) is particularly low because of deeply entrenched patriarchal values and social norms which contribute to discriminatory practices. In fact, the low status of women is believed to explain the ‘South Asia enigma’, that is, the relatively high prevalence of child under-nutrition in South Asian countries compared to sub-Saharan Africa despite the former’s more rapidly growing economy and per-capita income. This hypothesis was examined by IFPRI researchers who found that the low position of women in the family compared to men is one of the most important factors that explains the gap between the nutritional status of children in South Asia and sub-Saharan Africa (Smith et al., 2003). Not only is women’s power relative to men’s much lower in South Asia than in sub-Saharan Africa, this inequality has much higher costs in terms of child malnutrition than in sub-Saharan Africa. In other words, increasing women’s status will have a stronger influence on child nutrition in South Asia than in sub-Saharan Africa.

Although investments to improve women’s status and control over decisions are making progress, there is wide variation between countries in the region (Figure 2). In addition, adolescent pregnancy – which is linked closely with child marriage – remains highly prevalent in the South Asia region (Loaiza & Liang, 2013; Barjucharya, 2019), particularly in Afghanistan (20%) and Bangladesh (24%). However, in the region as a whole, adolescent pregnancy is not as high in South Asia (11%) as it is in sub-Saharan Africa (26%).

**Response to maternal nutrition in South Asia**

There is progressive recognition by national governments in South Asia of the impact of poor nutrition during the first 1000 days on national development and the costs of inaction (Aguayo & Menon, 2016). This has resulted in the development and implementation of multi-sector strategies and plans to scale up nutrition interventions. However, more attention is needed to protect nutrition during the 500 days between conception and six months when an infant is entirely dependent for its nutrition on its mother (Mason et al., 2014).

A recent review examined the status of policy and programme action on maternal nutrition interventions within the health system in the

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2 Data sourced from nationally representative surveys: Afghanistan National Nutrition Survey (NNS) 2013 and Afghanistan Demographic and Health Survey (DHS) 2015; Bangladesh DHS 2011 and 2014 and Bangladesh Low Birth Weight Survey 2015; Bhutan WHO Step Survey 2014 and Bhutan NNS 2015; India National Family and Health Survey (NFHS-4) 2016; Maldives DHS 2016-17; Nepal DHS 2016; Pakistan DHS 2017-18 and Pakistan NNS 2018; Sri Lanka DHS 2016.
3 Data sourced from nationally representative surveys: Afghanistan DHS 2015; Bangladesh DHS 2014, Bangladesh DHS 2017-18; Bhutan NNS 2015; India National Family and Health Survey (NFHS-3) 2016; Maldives DHS 2016-17; Nepal DHS 2016; Pakistan DHS 2017-18; Sri Lanka DHS 2016.

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**Table 1** Summary of the list of WHO nutrition recommendations on antenatal care (WHO 2016) and countries with policy or guidance on each recommendation (UNICEF, 2019)

<table>
<thead>
<tr>
<th>Category</th>
<th>Recommendation</th>
<th>Countries with policy or guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary interventions</td>
<td>In all contexts, counselling about healthy eating and keeping physically active during pregnancy is recommended for pregnant women to stay healthy and to prevent excessive weight gain during pregnancy</td>
<td>All except Pakistan</td>
</tr>
<tr>
<td></td>
<td>In undernourished populations, nutrition education on increasing daily energy and protein intake is recommended for pregnant women to reduce the risk of low birth weight neonates.</td>
<td>All except Maldives and Pakistan</td>
</tr>
<tr>
<td></td>
<td>In undernourished populations, balanced energy and protein dietary supplementation is recommended for pregnant women to reduce the risk of stillbirths and small for gestational age neonates.</td>
<td>All except Maldives and Pakistan</td>
</tr>
<tr>
<td>Iron and folic acid supplements</td>
<td>In all contexts, daily oral iron and folic acid supplementation with 30–60 mg of elemental iron and 400 μg (0.4 mg) of folic acid is recommended for pregnant women to prevent maternal anaemia, puerperal sepsis, low birth weight and preterm birth.</td>
<td>All countries</td>
</tr>
<tr>
<td></td>
<td>Intermittent oral iron and folic acid supplementation with 120 mg of elemental iron and 2800 μg (2.8 mg) of folic acid once weekly is recommended for pregnant women to improve maternal and neonatal outcomes if daily iron is not acceptable due to side-effects, and in populations with an anaemia prevalence among pregnant women of less than 20%.</td>
<td>No countries</td>
</tr>
<tr>
<td>Calcium supplements</td>
<td>In populations with low dietary calcium intake, daily calcium supplementation (1.5–2.0 g oral elemental calcium) is recommended for pregnant women to reduce the risk of pre-eclampsia.</td>
<td>All except Maldives, Pakistan and Nepal</td>
</tr>
<tr>
<td>Vitamin A supplements</td>
<td>Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem to prevent night blindness.</td>
<td>Nepal only</td>
</tr>
<tr>
<td>Restricting caffeine</td>
<td>For pregnant women with high daily caffeine intake (more than 300 mg per day), lowering daily caffeine intake during pregnancy is recommended to reduce the risk of pregnancy loss and low birth weight neonates.</td>
<td>Afghanistan, Bhutan, Maldives and Nepal</td>
</tr>
</tbody>
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**Figure 1** Women’s nutrition status and low birth weight in South Asia

**Figure 2** Gender equality, empowerment and service utilisation indicators for women in South Asia

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South Asia region (UNICEF, 2019) relative to the World Health Organization’s “Recommendations on Antenatal Care for a Positive Pregnancy Experience” (WHO, 2016). This includes a set of eight recommendations for improving maternal nutrition, two of which are applicable in all contexts (Table 1). The review found that the number of recommendations covered by national policies or programme guidance ranges from one to six in South Asia countries and that only daily iron and folic acid (IFA) supplementation is included in all countries. Policies and programme guidance on the two interventions that are specific to undernourished populations (nutrition education on increasing energy and protein intake and balanced energy and protein supplementation) are in place in all countries except the Maldives and Pakistan.

In 2020, WHO released new recommendations on antenatal multiple micronutrient supplements (MMS) “in the context of rigorous research” (WHO, 2020). These MMS are already recommended for pregnant and breastfeeding women to prevent and control micronutrient deficiencies in populations affected by an emergency (WHO, 2007). The article by Hurley and colleagues in this issue of Field Exchange discusses how MMS could contribute to national efforts to lower low birth weight (LBW) and wasting at birth.

Box 1: Common features of programme approaches that were effective in improving maternal nutrition intervention coverage in South Asia (Goudet et al., 2018)

- Use of formative research and client assessments to inform the design of programme approaches and actions
- Utilise community-based delivery platforms to increase women’s access to services
- Engage family members, as well as pregnant women, to influence behavioural change
- Take actions to improve the capacity, supervision, monitoring and motivation of front-line service providers to provide information and counselling
- Provide free access to micronutrient supplements

Barriers and enablers to the access and utilisation of maternal nutrition interventions vary by intervention and country and exist at the level of the individual (woman), her household and the health system (Goudet et al., 2018). Individual-level factors include a woman’s education level and knowledge, capacity to take decisions to access healthcare, self-efficacy to follow recommended practices, tolerance to the side-effects of micronutrient supplements and cultural beliefs. Household level factors include the support and encouragement of women by other family members to access antenatal care (ANC) and follow recommended practices, the husband’s education level and household wealth.

Health system bottlenecks and barriers to delivering maternal interventions act across all health system pillars and at all levels from national to community. However, they tend to be concentrated at the ‘down-stream level’ and relate to the demand for, supply of and quality of maternal nutrition interventions. They include health workforce constraints (management, training, supervision, motivation and distribution/density), supply chain breaks (especially for IFA and calcium supplements), service delivery and utilisation issues (availability of community-based services, quality of counselling, timing of first ANC visit and number of ANC visits) and information management (availability of routine data on coverage) (Goudet et al., 2018; UNICEF, 2019).

Because of these bottlenecks, the coverage of maternal nutrition interventions in the region continues to lag behind the utilisation of ANC services. The coverage of IFA supplements during pregnancy illustrates this point well. IFA supplementation has been a part of public health policy for several decades yet the proportion of women who received an iron supplement for at least 90 days during their previous pregnancy is less than 70% in Afghanistan, India, Maldives and Pakistan, and there is no data for Bangladesh and Bhutan (Figure 3). The proportion of women who take IFA supplements for at least 90 days is closely correlated but often lower than the coverage of at least four ANC visits. This indicates that access to and utilisation of antenatal care platforms is important, but insufficient, for ensuring effective coverage of IFA supplementation.

A recent systematic review examined the evidence on what works to improve the coverage of maternal nutrition interventions in the region (Goudet et al., 2018). The review focused only on micronutrient supplements as there was a lack of studies on other interventions. It found that actions to reach pregnant women with IFA and calcium supplements in their homes and communities, combined with information and counselling, can improve the access to and consumption of supplements. These effects are greatest if the design of programmes and approaches is based on formative research, engages influential family members, increases the capacities, supervision and motivation of frontline workers, provides services and supplements free of charge and ensures that the supply of supplements is uninterrupted (Box 1).

Despite a lack of global normative guidance on balanced protein energy supplementation during ANC, several countries have programmes for dietary supplementation that target pregnant and breastfeeding women through health or social safety programmes. In India and Sri Lanka, a monthly take home ration of fortified supplementary food is delivered to pregnant and breastfeeding women alongside health services. In Bangladesh, the food basket of social protection programmes includes fortified food for pregnant and breastfeeding mothers. In Afghanistan and Nepal, the national Integrated Management of Acute Malnutrition (IMAM) guidelines in Afghanistan and Nepal have provisions for the dietary supplementation of pregnant and breastfeeding women. However, there is no data or evidence on the coverage of these programmes or their effectiveness in improving maternal nutrition and birth weights – a major gap in a region with the highest prevalence of maternal thinness and LBW.

All of these analyses predate the COVID-19 pandemic. In all countries across the region, the lockdown and public health measures taken to halt the spread of the virus severely restricted the availability of, access to and utilisation of ANC and maternal nutrition services. However, by May and June 2020, most countries reprioritised and reintroduced these services, making a range of programmatic adaptations to allow service to continue and minimise risks to healthcare providers and their clients. For example, in Sri Lanka, relatives of pregnant women were permitted to collect their supplements during the height of the pandemic, in Afghanistan, nutrition counsellors were included in mobile health teams to ensure that nutrition counselling reached remote and hard to reach areas and in India, counselling services on healthy diets during pregnancy are being delivered remotely through social platforms.
media and voice over IP platforms. These examples demonstrate the resilience of the primary health-care system in South Asia and some of these adaptions, such as remote counselling, may offer long-term solutions to increasing access to services. However, there are significant threats ahead as further lockdowns may be introduced locally or nationwide and the economic downturn is impacting upon government budgets. Protecting essential maternal nutrition services from these threats is a priority.

Implications for child wasting prevention efforts

Within the continuum of the first 1,000 days from conception to two years, efforts to manage child wasting in the region have largely focused on enhancing access to the therapeutic care of severely wasted children. There has not been adequate attention to the prenatal factors that contribute to the high burden of small for gestational age, preterm birth and low birth weight (LBW) infants which are important risk factors contributing to the high prevalence and burden of child wasting in the region.

To improve women’s nutrition status at conception, it is essential to give greater attention to the nutrition needs of women before pregnancy. Preconception nutrition has been shown to improve fetal growth and reduce nutritional anthropometric deficits in early infancy in South Asia (Dhaded et al., 2020) but remains a neglected area of programming. These investments should be underpinned by efforts to improve adolescent nutrition, prevent adolescent pregnancies and address gender inequities and other social and health determinants of LBW.

While the health sector cannot solve all the underlying causes of poor maternal nutrition, it must ensure that women have, at the very minimum, access to quality maternal health and nutrition interventions during antenatal care (ANC). The adoption and implementation of relevant WHO nutrition recommendations is essential to ensure that ANC services support the nutritional needs of pregnant women. It is important to optimise health worker contacts with pregnant women to ensure the full package of nutritional assessments, nutrition counselling support, micronutrient supplementation and dietary supplementation for food insecure population groups reaches women. The Mathrupoor-na (‘complete motherhood’) programme in Karanataka state in India provides a good example of efforts to integrate a package of maternal nutrition services, including dietary supplementation, into existing service delivery platforms to reduce undernutrition among women and improve birth weights (Mahadevan et al., 2019). WHO now recommends a minimum of eight ANC contacts to reduce perinatal mortality and improve women’s experience of health and nutrition care during pregnancy. Community-based platforms can increase access to ANC in early pregnancy, the number of contacts and the coverage of maternal nutrition interventions.

Adolescent girls and women experiencing their first pregnancy and women at nutritional risk need special attention from ANC providers. Early identification (through screening and nutritional assessment) and referral and management of adolescent and women at nutritional risk (low stature, thinness and anaemia) should be part of routine nutritional care during pregnancy to promote optimal fetal growth and prevent adverse birth outcomes which predispose infants to high risks of child undernutrition. Criteria for women at nutritional risk should be included in the definitions of high-risk pregnancies in appropriate maternal health and nutrition guidelines. Pregnant women in undernourished populations will benefit from balanced energy and protein dietary supplementation to reduce small for gestational age neonates. The lack of global guidance on this issue remains an impediment to policy and programme action.

In addition, there is need to address the care gaps in early infancy for infants who are born too small. As underscored in the UNICEF and WHO low birthweight estimates report (UNICEF & WHO, 2019), better data is needed on LBW to track progress and identify high-risk babies to provide timely care and support at health facility and community level. In countries such as Bangladesh, which is severely affected by LBW (28%) and where over half of infants are born at home, innovative approaches are needed to ensure all newborns are weighed. Furthermore, the provision of essential newborn care and nutritional support for infants who are born with a LBW or become nutritionally vulnerable in early life and their mothers are fundamental to improving neonatal and infant survival and to the prevention of wasting in South Asia.

Actions beyond the health system are also needed, particularly to improve women’s diets. The food, health and social protection systems should combine actions to increase the availability, affordability and acceptability of nutritious foods (Torieles & Aguayo, 2019). The education system plays an important role in increasing girls’ access to primary and secondary education and there is need to continue to press for policy and societal actions to raise the age at marriage and first pregnancy.

Conclusions

In South Asia, the poor nutritional status of women is driving the high prevalence of low birth weight (LBW) and child wasting and stunting. While there has been progress – which the recent COVID-19 pandemic threatens to unravel – ‘short, thin, anaemic and young’ is a defining characterisation of the maternal undernutrition challenge in the region. The coverage of maternal nutrition interventions is still not at the level needed to transform the nutritional care of women before and during pregnancy and social and gender norms continue to constrain girls’ and women’s access to and control over resources.

Efforts to lower the unacceptably high prevalence and burden of wasting (and stunting) in South Asia will not be successful unless greater attention is given to (1) the nutritional care of adolescent girls and women before and during pregnancy, (2) the identification of infants who are born small and (3) provision of nutritional care to infants who are born small or become nutritionally vulnerable in early life and their mothers. This requires a continuum of care from preconception/pre-pregnancy to pregnancy and postpartum that is responsive to the underlying social, economic and gender inequities in access to quality healthcare in the region. It is essential that these maternal nutrition services are fully integrated into primary healthcare and that governments continue to prioritise these services to mitigate the impacts of the COVID-19 pandemic on women and their children. There is also a need to build the evidence base on the effectiveness of maternal nutrition intervention packages to prevent small for gestational age and LBW and on approaches to improve the care of infants who are born too small in South Asian countries.

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References


The global and regional context for wasting

Child wasting in early life adversely affects growth and development and increases the risk of mortality if left untreated.² For this reason, the Sustainable Development Goals (SDG) incorporated the World Health Assembly target to reduce the wasting prevalence to <5% by 2025 which was later extended to <3% by 2030.² However, progress has been slow globally and there has only been a modest reduction in the wasting prevalence between 2015 (7.4%) and 2019 (6.9%).⁴

Two thirds (66%) of the world’s wasted children – some 30.8 million – live in the Asia and Pacific region.³ Most of these children are concentrated in the eight countries of South Asia (25.1 million), however the burden in East Asia and Pacific is also substantial (5.7 million). In fact, the prevalence of wasting exceeds the threshold for a public health concern (>5%) in 70% of countries in Asia and the Pacific.⁴

The global nutrition community recognises that the response to wasting has been inadequate.⁴

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UN Global Action Plan (GAP) Framework for Child Wasting and the Asia and Pacific Region

By Harriet Torlesse, Roland Kupka, Warren T K Lee, Britta Schumacher and Angela de Silva

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