

# Field Exchange

Emergency Nutrition Network



## Special issue Child wasting in South Asia

Emergency Nutrition Network in collaboration with UNICEF Regional Office for South Asia

# Contents

## 3 Editorial

## Field Articles

- 13 Integration of essential nutrition interventions into primary health-care in Pakistan to prevent and treat wasting: A story of change
- 17 Wasting prevention and treatment - central to stunting reduction in Pakistan
- 22 Experiences of the Integrated Management of Acute Malnutrition (IMAM) programme in Nepal: from pilot to scale up
- 26 One UN for nutrition in Afghanistan - Translating global policy into action: A policy shift to tackle wasting
- 34 Integration of management of children with severe acute malnutrition in paediatric inpatient facilities
- 38 Managing at risk mothers and infants under six months in India – no time to waste
- 43 Supporting healthy growth in infants in low-resource settings in Mumbai, India
- 49 Community management of acute malnutrition in Rajasthan, India
- 53 Development and use of alternative nutrient-dense foods for management of acute malnutrition in India
- 57 Adaptations to CMAM programming in Cox's Bazar in the context of the COVID-19 pandemic
- 61 Integrating screening for acute malnutrition into the vitamin A supplementation campaign in the Rohingya camps during the COVID-19 pandemic
- 64 Delivery of maternal nutrition interventions at scale and mainstreaming into the health system in Bangladesh
- 98 Previous FEX articles of relevance for wasting in South Asia

## News

- 30 *Nutrition Exchange South Asia* issues on maternal nutrition and complementary feeding
- 31 South Asia Technical Advisory Group on Wasting
- 31 WFP win Nobel Peace Prize
- 32 What's new at ENN?
- 33 Tackling child wasting: A review of costing tools and an agenda for the future

## Views

- 7 South Asia and child wasting – unravelling the conundrum
- 92 Improving Maternal Nutrition in South Asia: Implications for Childhood Wasting Prevention Efforts
- 96 UN Global Action Plan (GAP) Framework for Child Wasting and the Asia and Pacific Region

## Research Snapshots

- 68 Integrating nutrition interventions into an existing maternal, neonatal and child health programme in Bangladesh
- 68 Factors influencing maternal nutrition practices in a large scale maternal, neonatal and child health programme in Bangladesh
- 69 The effect of the COVID-19 pandemic on the social, economic and health status of low-income populations in India
- 69 Severe wasting among Indian infants under six months of age
- 70 Burden of child and maternal malnutrition and trends in states of India 1990-2017
- 70 Effect of supplementation during pregnancy and lactation on the nutritional status of infants in Pakistan

- 71 Impact on birth weight and child growth of women's groups with and without transfers of food or cash during pregnancy in Nepal
- 71 Maternal profiles and social determinants of severe acute malnutrition among children under five years of age: A case-control study in Nepal
- 72 Aiming higher for maternal and child nutrition in South Asia
- 72 Birthweight and feeding practices are associated with child growth outcomes in South Asia
- 73 Factors associated with wasting among children under five years old in South Asia: Implications for action
- 73 Improving women's nutrition is imperative for the rapid reduction of childhood stunting in South Asia
- 73 Wasting in the wider context of undernutrition: An ENN position paper
- 74 Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality
- 74 Causes and consequences of child growth failure in low- and middle-income countries
- 75 Duodenal microbiota in stunted undernourished children with enteropathy
- 75 Early childhood linear growth failure in low- and middle-income countries
- 75 Development of complementary foods for moderately wasted children to improve gut microbiota status

## Research

- 76 Prevention of child wasting in Asia: Possible role for multiple micronutrient supplementation in pregnancy
- 81 Concordance between weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC) for the detection of wasting among children in Bangladesh host communities

## Research Summaries

- 85 Effectiveness of programme approaches to improve the coverage of maternal nutrition interventions in South Asia
- 86 The link between foetal and childhood nutrition and adult non-communicable disease: lessons from birth cohort studies in India
- 88 Child wasting and concurrent stunting in low- and middle-income countries

## Report Summaries

- 89 Growth faltering in early infancy: highlights from a two-day scientific consultation
- 89 Lives upended - how COVID-19 threatens the futures of 600 million South Asian children
- 90 Report of the South Asia 'Stop stunting: No time to Waste' conference
- 90 Report of the South Asia 'Stop stunting: Power of Maternal Nutrition' conference
- 91 Report of the South Asia 'Stop stunting: Improving Young Children's Diets' conference
- 91 Wasting in South Asia: Building the evidence on policy and programme response
- 91 Low birth weight estimates: Levels and trends 2000–2015





Dear readers,

A warm welcome to our 63<sup>rd</sup> edition of *Field Exchange*, focused on child wasting in South Asia. The idea for this issue came out of a meeting in New York back in 2018, convened by the UNICEF Regional Office for South Asia (ROSA) team who were feeling somewhat frustrated by the lack of attention and investment in wasting management – especially treatment – in the region. At ENN, we realised we were also guilty of neglecting South Asia; over the years, experiences from Africa have dominated the pages of *Field Exchange*. To begin to ‘right this wrong’, we embarked on this special edition on child wasting in South Asia, in partnership with the UNICEF ROSA team, to give a greater voice to those working in the region.

## The problem

The numbers should speak for themselves. Regional child wasting prevalence and burden is huge – 25.1 million wasted children (14.5%) of whom 7.1 million (4.5%) are severely wasted – twice as high as in sub-Saharan Africa.<sup>1</sup> On top of this, an increase in 3.9 million wasted children in South Asia is predicted as a result of COVID-19.<sup>2</sup> Even more worryingly, these figures are based on prevalence data and do not take into account incident cases, therefore underestimating the true number of children in need. Recent analyses of large longitudinal cohorts by the Knowledge Integration (KI) initiative of the Bill & Melinda Gates Foundation, summarised in this edition, found that wasting prevalence estimates may underestimate the number of children who have experienced wasting episodes by as high as seven-fold in South Asia (five-fold world-wide).<sup>3</sup> Work by UNICEF to update incidence correction factors is long overdue for release – until that time we remain in the dark about the true burden and costs of wasting worldwide. Based on prevalence figures alone, treatment coverage in the region is estimated to be less than 5% – and yet these numbers have not been enough to catalyse action. So, we set out to help bring attention to this crisis and to ask the question, why hasn’t there been more progress and what must we do about it?

## A word on terminology: wasting v acute malnutrition

For consistency, we’ve attempted to use the term ‘wasting’ rather than ‘acute malnutrition’ where possible in this issue to reflect what seems to be the direction of travel in the sector. This is on the basis of the fact that wasting is often not an ‘acute’ event. However, some authors opted to retain ‘acute malnutrition’ to align with nationally accepted terminology and we deferred to their judgement in that regard. Strictly speaking, ‘wasting’ is based on weight for height z-score (WHZ); in practice MUAC is often included but kwashiorkor excluded (a neglected form of undernutrition that affects much fewer children but carries a high risk of death). However, ‘wasting’ is increasingly being used as short-hand term for not only WHZ <-2 SD but also MUAC <125 mm and kwashiorkor.



## Overview of content

In close partnership with the UNICEF ROSA team, we focused on the countries with the highest burden of wasting – Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka. From here, we sought programme experiences and research on priority themes such as epidemiology of wasting and growth failure, low birth weight (LBW), management of ‘at risk’ mothers and infants under six months of age, integrated treatment and health system strengthening and links between humanitarian and development programming. As programmers wrote articles for this edition, COVID-19 hit the world; this became a cross-cutting theme and emerging adaptations and innovations to both research and programming are embedded in articles from India, Cox’s Bazaar (Bangladesh) and Nepal. Two regional groups – the Wasting in South Asia Technical Advisory Group<sup>4</sup> and the Asia sub-working group on wasting welcomed ENN to their tables, allowing us to listen and learn from their priorities and actions.

Nine months later, we have amassed a rich body of work for you to delve into. We have 12 field articles by authors delivering programmes in India, Bangladesh, Pakistan, Afghanistan and Nepal, two original research articles, three views articles and ‘bonus’ online content.<sup>5</sup> We have also summarised a selection of peer-reviewed papers that we felt most relevant to inform the policy and programming discourse, with an introductory editorial note to the ‘research snapshot’ section to give to you a steer on the content. We’ve also complemented our written word with ‘live’ voices in the form of podcasts from authors

in several countries and regional and global stakeholders closely engaged in the region.<sup>6</sup>

## The wasting conundrum

So, where should you start? We suggest you begin with the eloquent reflections on child wasting in the region by Harriet Torlesse and Minh Tram Le from UNICEF ROSA where they try to “unravel the wasting conundrum” in South Asia. Their overview of wasting gets to the heart of helping us to understand why we are in such a predicament on child wasting in South Asia and identifies critical areas for attention and action. Setting the scene, they describe how wasting in the region is not a ‘humanitarian’ problem; the region is certainly affected by emergencies but most wasted children in South Asia live in development settings. Furthermore, wasting (and stunting) persists despite economic growth – with the exception of Afghanistan, all South Asia countries are classed by the World Bank as middle-income. What stands out from the region is how fundamental maternal nutrition and health, LBW and early infant growth experiences are to immediate and subsequent growth failure burden, causes and consequences.<sup>7</sup> The UNICEF ROSA team’s vision for “reimagined care” for wasted children in South Asia has four components: 1) government leadership and ownership of the prevention and treatment of wasting at its core, 2) preventive actions central to national

<sup>1</sup> UNICEF, WHO & World Bank (2020). *Levels and Trends in Child Malnutrition: Key Findings of the 2020 Edition of the Joint Child Malnutrition Estimates*. Geneva: World Health Organization.

<sup>2</sup> Headey, Derek et al. & Standing Together for Nutrition consortium (2020). Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality. *Lancet (London, England)*, 396(10250), 519–521. [https://doi.org/10.1016/S0140-6736\(20\)31647-0](https://doi.org/10.1016/S0140-6736(20)31647-0)

<sup>3</sup> Research summary in this edition “*Child wasting and concurrent stunting in low- and middle-income countries*”

<sup>4</sup> News article in this edition “*South Asia Technical Advisory Group on Wasting*”

<sup>5</sup> Megan W. Bourassa, Filomena Gomes and Gilles Bergeron (2020). Thiamine Deficiency Remains an Urgent Public Health Problem. *Field Exchange* 63, October 2020. [www.ennonline.net/fex/63/thiaminedeficiency](http://www.ennonline.net/fex/63/thiaminedeficiency)

<sup>6</sup> [www.ennonline.net/mediahub](http://www.ennonline.net/mediahub)

<sup>7</sup> Research snapshots in this edition “*Early childhood linear growth failure in low- and middle-income countries*”, “*Child wasting and concurrent stunting in low- and middle-income countries*” and “*Causes and consequences of child growth failure in low- and middle-income countries*”

efforts that prioritise maternal health and nutrition, 3) strengthened health system integration and continuum of care to prevent and treat all wasted children and 4) development of an evidence base on the epidemiology of wasting in South Asia and effective models of care. The challenge is how to put this vision into practice.

So why has wasting achieved so little attention? One reason may be the prioritisation of stunting prevention in the region which has fuelled a neglect of wasting and, in doing so, reinforced a siloed approach to both forms of undernutrition. This is despite strong evidence that wasting and stunting are connected in terms of causes, may concurrently affect a child and have severe consequences for survival.<sup>8</sup> Pooled analysis of 18 longitudinal cohorts (10,854 children) from 10 low- to middle-income countries in South Asia, sub-Saharan Africa and Latin America found that concurrent wasting and stunting was most prevalent in South Asia, with peak prevalence at ages 12-18 months.<sup>3</sup>

On a positive note, there are signs of growing awareness that failing to address wasting may actually be a key factor in the persistently high rates of stunting in the region, as reflected in articles from Pakistan<sup>9</sup> and Afghanistan.<sup>10</sup> They describe policy development, commitment for collective UN and government action and early stage operational planning to align wasting and stunting preventive and treatment interventions. While this has not yet translated into convergence in these countries, the authors describe political will, policy frameworks and programming opportunities to do so. It remains that the complexities of multiple ministries being responsible for different interventions, along with devolved governance, make coordination and alignment easy in principle but challenging in practice. We have much still to learn on 'how' to connect prevention and treatment across the spectrum of undernutrition and what it takes for ministries, departments and administrative structures to do so. We look forward to the learning that we hope will be generated from those countries championing new ways forward. The current UNICEF-led development of country-led Road Maps for Action for the UN Global Action Plan (GAP) on Child Wasting<sup>11</sup> offers a great opportunity to do just that, as is happening in Afghanistan (see below)<sup>10</sup> and the South Asia region.<sup>12</sup> This also speaks to a key role for the next phase of the Scaling up Nutrition (SUN) Movement for regional and country-centric action to support governments in translating national

multi-sectoral nutrition ambitions to connect wasting and stunting into workable plans and to capture the rich learning from doing so.

### Short, thin, anaemic and young

A recurring theme in this edition is the need for more focus on interventions to boost maternal nutrition and health. A review of the evidence on maternal nutrition in the region by Torlesse and Murira<sup>13</sup> highlights multiple bottlenecks in the health system that result in low coverage of maternal iron and folic acid (IFA) supplementation (the most common maternal nutrition intervention), gaps in global guidance on dietary supplementation in pregnancy and limited evidence on what is needed and what works in different settings. The authors describe how poor action on maternal nutrition and health fuels the high prevalence of infants with LBW – infants who are more likely to be born wasted and/or stunted and/or underweight and are at higher risk of death, even after they 'catch up' in growth. This is particularly pertinent in South Asia since the highest levels of wasting occur at birth and in the first three months of life.<sup>3</sup> Adolescent girls who become mothers too early are more likely to give birth to babies that are too small, compromising their own health and that of future generations.<sup>14</sup> Torlesse and Murira conclude that "short, thin, anaemic and young" is a defining characterisation of the maternal undernutrition challenge in the region. There is immediate action we can and should take. Multiple micronutrient supplementation (MMS) in pregnancy shows real promise to improve foetal growth and so prevent LBW (especially related to prematurity)<sup>15,16</sup> and hence reduce the number of babies being 'born wasted and/or stunted'. While many argue there is strong evidence to support a transition from IFA to MMS, WHO recommendations continue to adopt a cautious approach due to concerns regarding the risk of use in populations that are not micronutrient deficient and therefore state that countries with a high prevalence of nutritional deficiencies may choose to adopt MMS. In practice, this makes for a protracted process with many governments unclear how to do this, or not keen to embark on what may still be perceived as 'going against' WHO recommendations. To help on the 'how' of putting WHO recommendations into practice, an article in this edition by Hurley et al summarises key evidence and shares experiences of scaling up MMS use in healthcare systems in Indonesia and Bangladesh using a phased approach.<sup>15</sup> Further interesting

examples of programming on maternal nutrition include a field article by Dalal et al that targets pregnant women and at risk infants in Mumbai<sup>17</sup> and a field article by Ash et al that explores the mainstreaming of maternal nutrition into the government health system in Bangladesh.<sup>18</sup>

### Scale, sustainability, simplicity

With any intervention, scale and sustainability should be considered from the outset to maximise the likelihood of success<sup>19</sup> – the simpler the approach, the better the chances of success. Over the years, we have featured many articles in *Field Exchange* that describe short-term pilot programmes, without explicit consideration of the potential to scale and sustain. We have also learned that scale up takes a long time. What is notable in many of the articles we feature in this special edition is the consideration given both to integration and to leveraging existing systems and services from the outset. Given this, failure to scale up treatment in the region may partly reflect a reticence to take on treatment when there is no clear vision or plan on how it can be sustained. Having said that, we have some good examples of countries on pathways to scale up of treatment in India,<sup>20,21</sup> Pakistan<sup>9</sup> and Nepal<sup>22</sup> where government leadership and buy-in from the outset has been a key enabling factor that worked towards embedding into existing systems and services. In Pakistan, partners capitalised on the Government's signing of the Astana Declaration on Universal Health Coverage and successfully advocated to include community-based management of acute malnutrition (CMAM) in the public health system; costing, capacity building and plans for rollout are now underway. We also feature promising pathways to scaled up care: complicated wasting case management is being integrated into in-patient paediatric care in India,<sup>23</sup> health workers in India are providing home-based care for children born LBW<sup>24</sup> and programmers in Afghanistan<sup>10</sup> and India<sup>21</sup> are actively exploring approaches to manage nutritionally at-risk infants under six months and their mothers at community level. In India, a vision to "reorganise the health system" to facilitate a continuum of care for newborn and small infants beyond the neonatal period identifies the need for trials on impact and cost-effectiveness and testing for potential to scale up into existing delivery systems.<sup>24</sup>

Simplified approaches to wasting treatment are an active area of programming and research being carried out with the aim of facilitating scale-

<sup>8</sup> Wells JCK, Briend A, Boyd EM, et al. (2019). Beyond wasted and stunted-a major shift to fight child undernutrition. *Lancet Child Adolesc Health* 3(11):831-4. Epub 2019/09/16. doi: 10.1016/S2352-4642(19)30244-5. PubMed PMID: 31521500.  
<sup>9</sup> Field article in this edition "Wasting prevention and treatment-central to stunting reduction in Pakistan"  
<sup>10</sup> Field article in this edition "One UN for nutrition in Afghanistan - Translating global policy into action: A policy shift to tackle wasting"  
<sup>11</sup> www.childwasting.org  
<sup>12</sup> Views article in this edition "UN Global Action Plan (GAP) Framework for Child Wasting and the Asia and Pacific Region"  
<sup>13</sup> Views article in this edition "Improving Maternal Nutrition in South Asia: Implications for Childhood Wasting Prevention Efforts"  
<sup>14</sup> Salam, R. A., Faqqah, A., Sajjad, N., Lassi, Z. S., Das, J. K., Kaufman, M., & Bhutta, Z. A. (2016). Improving Adolescent Sexual and Reproductive Health: A Systematic Review of

Potential Interventions. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 59(4/5), S11-S28. https://doi.org/10.1016/j.jadohealth.2016.05.022  
<sup>15</sup> Research article in this edition "Prevention of child wasting in Asia: Possible role for multiple micronutrient supplementation in pregnancy"  
<sup>16</sup> https://micronutrientforum.org/goalkeepers/mms-stakeholder-alignment-consultation/  
<sup>17</sup> See field article in this edition entitled "Supporting healthy growth in infants in low-resource settings in Mumbai, India"  
<sup>18</sup> See field article in this edition entitled "Delivery of maternal nutrition interventions at scale and mainstreaming into the health system in Bangladesh" and research snapshots entitled "Integrating nutrition interventions into an existing maternal, neonatal and child health programme in Bangladesh" and "Factors influencing maternal nutrition practices in a large scale maternal, neonatal and child health programme in Bangladesh"

<sup>19</sup> Management Systems International (2016). Scaling Up – From Vision to Large-Scale Change A Management Framework for Practitioners Third Edition.  
<sup>20</sup> See field article in this edition entitled "Community management of acute malnutrition in Rajasthan, India."  
<sup>21</sup> Field article in this edition "Managing at risk mothers and infants under six months in India - no time to waste."  
<sup>22</sup> See field article in this edition entitled "Experiences of the Integrated Management of Acute Malnutrition (IMAM) programme in Nepal: from pilot to scale-up"  
<sup>23</sup> See field article in this edition entitled "Integration of management of children with severe acute malnutrition in paediatric inpatient facilities"  
<sup>24</sup> Growth faltering in early infancy: highlights from a two-day scientific consultation. *Field Exchange* 63, October 2020. www.enonline.net/fex/63/growthfalteringscientificconsultation



up.<sup>25</sup> Simplification of process/indicators/protocols feature in several articles in this edition, such as simpler, reduced dosage schedules in Afghanistan to economise on ready-to-use therapeutic food (RUTF) and so reach more children and use of mid-upper arm circumference (MUAC) in both Cox's Bazar in Bangladesh<sup>26</sup> and India<sup>21</sup> as an adaptation to COVID-19. Simplifications are not necessarily straightforward – use of MUAC in screening in Cox's Bazar as part of a vitamin A supplementation campaign successfully helped to identify many children in need of treatment. However, expanded MUAC criteria (to try to capture excluded low weight for height (WHZ) children) led to an overwhelming rise in admissions to targeted supplementary feeding programmes that is now under review by the Nutrition Sector in Cox's Bazaar.<sup>27</sup> In India, a technical consultation concluded that weight-for-age z-score (WAZ) could “operationally simplify” community-level assessment to identify infants under six months at highest risk of death;<sup>24</sup> WAZ was also used as a criterion to identify both infants and children for in-patient wasting treatment in New Delhi.<sup>23</sup> Given that WAZ captures concurrent wasted and stunted children,<sup>28</sup> LBW infants<sup>29</sup> and infants under six months of age<sup>30,31</sup> at higher mortality risk and is measured in growth monitoring programmes throughout the region, this is a direction of travel we would do well to watch and learn from globally. Which indicators best identify children at risk and for which types of care remains the subject of much international research and recurring (often frustrated) debate. The current update of WHO guidelines on the prevention and treatment of wasting in infants and children through 2021<sup>32</sup> provides a critical opportunity for long overdue progress and clarity.

### The cost of treatment

Like many other regions, the shortage of financial resources to sustainably cover the cost of services, including ready-to-use therapeutic food (RUTF) supply and to meet both development and humanitarian needs, is another key barrier to scaled up management of child wasting. By virtue of its ‘non-emergency status’, the region has not drawn the same level of donor support to address wasting as in sub-Saharan Africa where much funding has been secured through UN agencies and short-term ‘humanitarian’ financing. While short-term funding has significant drawbacks, it has catalysed treatment programming and continues to significantly subsidise service delivery in fragile contexts. That's not to say the South Asia region is unaffected by emergencies – it is and, in fact, progress on com-

munity-based treatment of wasting in Pakistan, Nepal, Afghanistan and India (Bihar) all began as emergency responses dependent on humanitarian funds channelled through UN agencies and non-governmental organisations (NGOs). In Nepal, increasing allocations of domestic resources to wasting treatment has been critical in the transition from a programme that was humanitarian-dependent to one that is now nationally driven. In Pakistan, community-based management of acute malnutrition (CMAM) has been included at policy level as part of an essential package of interventions within the public health system that is now being costed to inform stepped rollout. However, Afghanistan continues to rely on short-term emergency funds with considerable shortfalls that are a fundamental barrier to scaled up treatment. Sustainability of funding is also identified as a key challenge to the further scale-up of POSHAN-II, an integrated CMAM programme, successfully implemented across 20 districts of Rajasthan in India. The authors of an article on this subject in this issue<sup>20</sup> consider that the success of a government-funded programme will depend on a robust management information system, a trained healthcare workforce, a strong reporting mechanism and significant resources and supply-chain management for Energy-dense nutrition supplements (EDNS) (the RUTF equivalent used). In their regional wasting overview,<sup>33</sup> Torlesse and Le Min conclude that allocation of domestic funding is critical to address wasting but, given the burden of care in the region, the problem is too immense for governments to handle alone. They therefore call for the development community to step up in terms of financial assistance and technical support.

Ultimately, to advocate for much greater investment to treat wasting in the region, we need to be able to say how much it will cost. We struggled to get a clear answer to this question, even where some degree of scale-up had been achieved. Work is now underway by UNICEF to generate costing guidelines based on a synthesis of existing data and tools and drawing on country experiences, including in South Asia, which should reflect and feed into broader costing tools being used at country level.<sup>34</sup> However, the challenges of answering ‘how much’ remain many; costs are embedded within health system costs (such as staffing) and ‘hidden’ in multiple budgets and even estimating direct costs is rife with difficulties. Estimates become guestimates and are context dependent, making comparisons between countries difficult and global projections even more so.

The high costs of treatment reinforce the need to prevent wasting in the first place. Findings of a sociocultural study amongst a selection of those children enrolled in the POSHAN-II programme identified LBW and poor maternal nutrition as important drivers of severe wasting in their caseloads; the authors call for urgent action on multiple strategies on adolescent and maternal nutrition and health to reduce LBW and more operational research to identify links between CMAM and interventions such as the landmark Maternal and Child Health Integrated Programme (MCHIP) in India.<sup>20</sup> Given this, it is worth reading the article by Rupal et al on an innovative programme by a grassroots organisation to target high risk (LBW) infants with high quality, skilled, sustained breastfeeding support in the slums of Mumbai.<sup>17</sup> Operational data suggests they reduced the subsequent burden of wasting and stunting relative to community prevalence. In Afghanistan, prevention has been agreed as critical to reduce caseloads, catalysed by the increasingly unsustainable costs of treatment.<sup>10</sup> Here, all UN agencies have committed to a ‘One UN for Afghanistan’ strategy that addresses both prevention and treatment and is consistent with the government-led Afghanistan Food Security and Nutrition Agenda (AFSeN-A) Strategic Plan. The development of an Operational Roadmap in Afghanistan for the Global Action Plan on Child Wasting is being used as the opportunity to translate existing intent into programming action throughout 2020.

### The ready-to-use therapeutic food (RUTF) question

Nutrition is never without its controversies wherever you go in the world and South Asia is no exception. One area of debate that has significantly hindered scale up of treatment is around RUTF. Sanctioned by government for use in just three countries of the region (Afghanistan, Pakistan and Nepal) where it was introduced on the back of humanitarian programming, barriers to wider national endorsement relate to the financial costs linked to sustainability and scale, cultural acceptance of the product and the availability of local alternatives in existing services. Regional research on this front continues by icddr,b in Bangladesh<sup>35</sup> while an article in this issue from India by Achakzai et al describes experiences of testing an alternative formulation for wasting treatment based on a locally adapted product.<sup>36</sup> In the India experience, both milk protein content and observed weight gain do not meet current global standards/benchmarks. The authors reflect that, to achieve scale, compromise

<sup>25</sup> ENN Simplified approaches to the treatment of wasting Technical Brief. July 2020. [https://www.ennonline.net/attachments/3621/Tech-Brief-31Aug2020\\_Simplified-approach.pdf](https://www.ennonline.net/attachments/3621/Tech-Brief-31Aug2020_Simplified-approach.pdf)

<sup>26</sup> See field articles in this edition entitled “Adaptations to CMAM programming in Cox's Bazar in the context of the COVID-19 pandemic” and “Integrating screening for acute malnutrition into the vitamin A supplementation campaign in the Rohingya camps during the COVID-19 pandemic”

<sup>27</sup> See field article in this edition entitled “Integrating screening for acute malnutrition into the vitamin A supplementation campaign in the Rohingya camps during the COVID-19 pandemic” and research article entitled “Concordance between weight-for height z-score (WHZ) and mid-upper arm circumference (MUAC) for the detection of wasting among children in Bangladesh host communities”

<sup>28</sup> Growth faltering in early infancy: highlights from a two-day scientific consultation. *Field Exchange* 63, October 2020. [www.ennonline.net/fex/63/growthfalteringsscificconsultation](http://www.ennonline.net/fex/63/growthfalteringsscificconsultation)

<sup>29</sup> Myatt M, Khara T, Schoenbuchner S, et al. (2017). *Children who are both wasted and stunted (WaSt) are also underweight and have a high risk of death. Action Against Hunger Research for Nutrition*; Paris 2017.

<sup>30</sup> Mwangome, M., Ngari, M., Bwahere, P. et al. (2019). Anthropometry at birth and at age of routine vaccination to predict mortality in the first year of life: A birth cohort study in BukinaFaso. *PLoS one*, 14(3), e0213523. <https://doi.org/10.1371/journal.pone.0213523>

<sup>31</sup> Lelijveld N, Kerac M, McGrath M, Mwangome M and Berkley J A. (2017). *A review of methods to detect cases of severely*

*malnourished infants less than 6 months for their admission into therapeutic care.* ENN, The Child Acute Illness and Nutrition Network and LSHTM.

<sup>32</sup> <https://www.who.int/news-room/articles-detail/call-for-authors-scoping-review-guideline-prevention-treatment-of-wasting-infant-children>

<sup>33</sup> Views article in this edition “South Asia and child wasting – unravelling the conundrum”

<sup>34</sup> See news article in this edition entitled “Tackling child wasting: A review of costing tools and an agenda for the future”

<sup>35</sup> Visit <https://www.icddr.org/> under Research

<sup>36</sup> See field article in this edition entitled “Development and use of alternative nutrient-dense foods for management of acute malnutrition in India”



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is needed between the ideal and the real; it is arguably better to reach more children with a financially viable programme with lower but 'acceptable' outcomes. This (and similar points raised in global conversations in the context of WHO guideline development on the milk protein content of RUTF) does raise the question of whether there is a need to re-examine benchmarks and standards for how we assess 'what works' and is 'good enough', where the priority is to provide the most children in need with an acceptable standard of care. It remains that, in the region, the lack of contextual evidence around RUTF use and formulations continues to stifle policy and programme action and, ultimately, the treatment of wasted children.

## New focus, stakeholders and narrative

When it comes to the management of child wasting in South Asia, the scope and task at hand looms large. Everything is important but we need to prioritise. For South Asia, the many voices from the region help to spotlight areas where action is urgently needed. In South Asia, the poor nutritional status of women is driving the high prevalence of LBW and child wasting and stunting. What happens in utero and in the early months of life no doubt also has implications for the success of subsequent treatment, child risk and outcomes. Across the world, wasting programming typically intervenes from six months of age and takes no account of growth trajectory

to that point – it should be no surprise then that infants don't all recover at the same pace or that they retain excess mortality risk and fail to thrive when they are 'cured' of this wasting episode. Perhaps this is part of the jigsaw of the 'failure to respond' and relapse of children.<sup>37</sup> We have neglected and continue to neglect the health and nutrition and standing of women; indeed, you could argue that the burden of child wasting is a marker of their neglect by the international health and nutrition system and that child under-nutrition is part of that collateral damage.

We need to infiltrate these long-term development approaches for stunting reduction with a wasting agenda. Some of the largest stunting prevention programmes are in the South Asia region but, despite considerable overlap between wasting and stunting, wasting is seldom looked at in terms of outcomes. If we are to engage the development community and incite them to pay proportionate attention to child wasting in South Asia, we need to change our narrative. Changing our narrative to one that focuses on 'risk' rather than 'body-size' is paramount to breaking down silos between wasting and stunting and to clearer, simpler advocacy.<sup>38,39</sup> Wasting management is really about degrees of prevention – preventing children's nutrition status from deteriorating in the first place in response to an insult (primary prevention), preventing decline in children with greater or combined vulnerabilities (or lack of successful primary prevention) and, finally, dealing more intensively with those children at greatest risk to prevent death (failed secondary intervention). Treatment is ultimately about heightened, targeted, timely and increasingly sophisticated preventive actions across the lifecycle. The earlier the intervention, the lower the cost per child; a 'win-win' in both financial and human terms.

## Regional experiences, global relevance

Many of our readership are not sitting in South Asia; you may well question if this content is relevant for you. We assure you it is. Please take the time to delve into this rich body of learning. South Asia offers a wealth of capacity and opportunities to think and do things differently, and to help to drive innovative approaches that may not only inform policies and programmes to prevent

and treat wasting in South Asian countries but in other regions too. At ENN, we've learned a lot from this experience; our reflections here have drawn on ENN colleagues and will help to inform our relevant workstreams – wasting and stunting concurrence, management of at risk mothers and infants under six months, adolescent nutrition and the humanitarian/development nexus – as well as our future priority directions.

*We conclude with warm and deep thanks to Harriet Torlesse and Minh Tram Le for such a great working partnership and commitment to our joint effort, to UNICEF for supporting this endeavour and to all the individuals who somehow made the time to take pen to paper or chat with us in podcasts to share their experiences and learning. Throughout this process, we were continually impressed with the responsiveness and capacity of individuals within the region which we know is just the tip of its rich human capital. We hope this edition marks the beginning of regular contributions to Field Exchange from the South Asia region so that we continue to learn from each other. We welcome your feedback and comments – use our online forum for questions (en-net), letters to the editor or just email informal feedback and suggestions to the team.*

Enjoy!

Marie McGrath (Field Exchange Editor)

Chloe Angood (Field Exchange Sub-editor)

*With thanks to Jeremy Shoham (former Field Exchange Co-Editor), Tanya Khara (Technical Director) and Emily Mates (Technical Director) for their review of this editorial. Despite wanting to quietly depart, we couldn't let this edition go without marking the recent departure of Jeremy Shoham, our longstanding Field Exchange Co-Editor. See inside our back cover for warm thanks on behalf of the Field Exchange editorial team and the Field Exchange readership.*

<sup>37</sup> See Guidance to improve the collecting and reporting of data on relapse in children following treatment in wasting programmes, CORTASAM/No Wasted Lives, 2020, [www.nowastedlives.org/documents-relapse-statement](http://www.nowastedlives.org/documents-relapse-statement) and Schaefer et al (2020). Relapse and regression to severe wasting in children under the age of 5 years after exit from treatment: A theoretical framework. *Maternal and Child Nutrition* 2020. Pending publication.

<sup>38</sup> See news article in this edition entitled "What's new at ENN?"

<sup>39</sup> Kerac M et al. Severe Malnutrition: thinking deeply, communicating simply. *Commentary. BMJ Global Health* 2020. Pending publication.

## Media Hub Podcast list

An interview with Victor Aguayo, UNICEF Chief of Nutrition <https://www.enonline.net/mediahub/podcast/fex63aguayo>

Reflections from Zulfi Bhutta on child wasting in South Asia <https://www.enonline.net/mediahub/podcast/fex63bhutta>

Reflections from Bob Black on Child Wasting in South Asia <https://www.enonline.net/mediahub/podcast/fex63black>

Reflections from Purnima Menon on Child Wasting in South Asia <https://www.enonline.net/mediahub/podcast/fex63menon>

An interview with Dr. Andrew Mertens, UC Berkeley School of Public Health, on recently published papers on growth failure <https://www.enonline.net/mediahub/podcast/fex63mertens>

An interview with Britta Schumacher, Senior Regional Nutrition Advisor with World Food Programme Regional Bureau for Asian Pacific, on WFP's role and regional approaches for wasting management. <https://www.enonline.net/mediahub/podcast/fex63schumacher>

Insights on wasting management from Kedar Raj Parajuli, Chief of the Nutrition Section, Family Welfare Division, Department of Health Services,

Ministry of Health and Population Nepal <https://www.enonline.net/mediahub/podcast/fex63parajuli>

Thoughts on Pakistan's approach to wasting management from Dr Baseer Khan Achakzai, Nutrition Director for the Ministry of National Health, Service, Regulation and Coordination, Pakistan. <https://www.enonline.net/mediahub/podcast/fex63achakzai>

Reflections on wasting from Dr. Bawary, Integrated Management of Acute Malnutrition (IMAM) Officer, Ministry of Health Afghanistan <https://www.enonline.net/mediahub/podcast/fex63bawary>



## South Asia and child wasting – unravelling the conundrum

By Harriet Torlesse and Minh Tram Le



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Rewati, an adolescent mother with Purnima, her newborn baby (Nepal)

UNICEF/ROSA/RogerLemoyne2015

### Background

Each annual release of the Joint Malnutrition Estimates by United Nations Children’s Fund (UNICEF), World Health Organization (WHO) and World Bank Group confirms the same situation. That the epicentre of the global wasting crisis lies in South Asia. That the number of wasted (25.1 million) and severely wasted (7.7 million) children in South Asia is more than double the next highest region of sub-Saharan Africa (UNICEF, WHO and World Bank, 2020). And that this is not just a function of population size - the prevalence of child wasting (14.8%) and severe wasting in South Asia (4.5%) are also double the prevalence in sub-Saharan Africa (Figure 1).

And yet these numbers are failing to provoke the scale and quality of response needed from national governments and the development and humanitarian community. There has been virtually no progress in reducing the prevalence of child wasting in South Asia in the last 10 years,

and less than 5% of severely wasted children in South Asia are accessing treatment – one of the lowest coverage levels of any child health or nutrition intervention in the region.

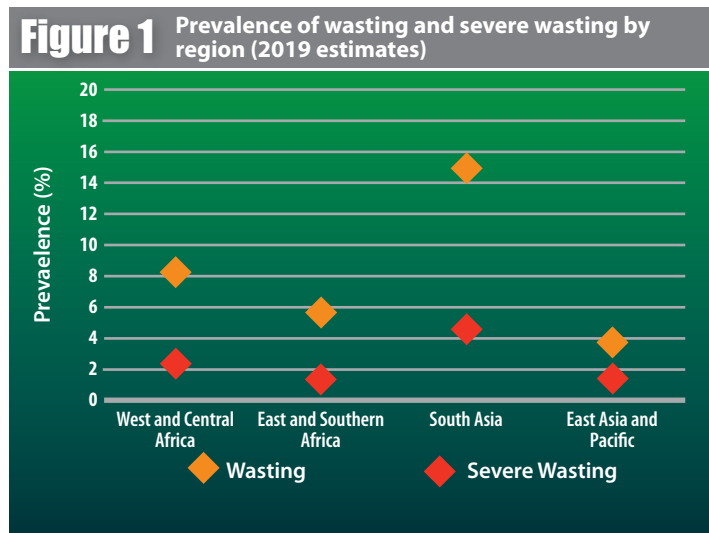
The high prevalence of child wasting, combined with the lack of access to treatment services, have far-reaching consequences for child survival, growth and development in the region. Severely wasted children are up to 11 times more likely to die than well-nourished children, and those who survive may experience poor linear growth, stunting and associated developmental delays, with consequences for human capital and economic growth (UNICEF, 2019). In fact, it is likely that the high prevalence of wasting explains in part why the prevalence of stunting (33.2%) is also higher in South Asia than any other region.

With the COVID-19 pandemic posing even greater threats to children’s nutrition in South Asia (Robertson et al, 2020; Headey et al, 2020), there is a critical need to rethink and recharge

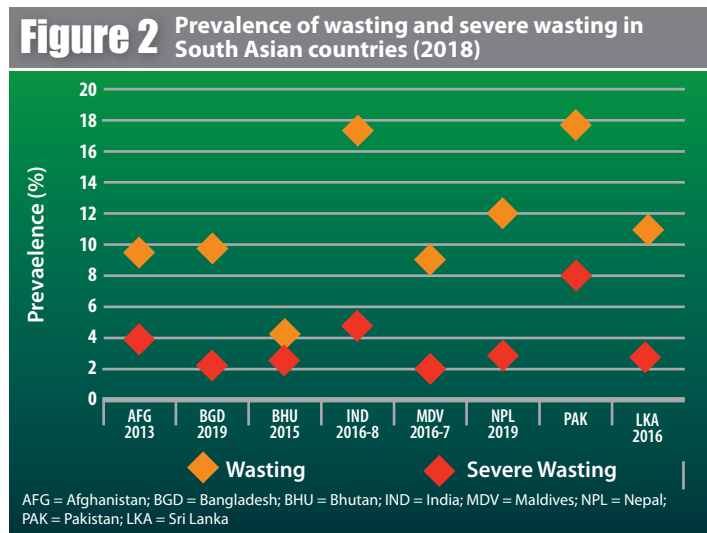
the response to the wasting challenge in the region. This requires a more nuanced understanding of the context-specific drivers of wasting, the barriers and bottlenecks that are holding back progress, and the opportunities to make better use of the resources that are available and that could be mobilised. This article examines the context of child wasting in South Asia, the current status of the policy and programme response in countries, the immense challenges brought on by the COVID-19 pandemic, and what is needed to transform progress.

### Child wasting in South Asia

Until the advent of the COVID-19 pandemic, the high prevalence of wasting persisted against a backdrop of relatively strong economic growth in South Asian countries; albeit with widening inequalities and inequities. The World Bank classifies only Afghanistan as a low-income country, the Maldives as upper-middle income and all other countries in the region as lower-middle income. Some countries in the region



Source: UNICEF, WHO and World Bank Joint Malnutrition Estimates, 2020 edition.



Source: Afghanistan National Nutrition Survey (NNS) 2013, Bangladesh Multiple Indicator Cluster Survey (MICS) 2019, Bhutan NNS 2015, India Comprehensive National Nutrition Survey 2016-7, Maldives DHS 2016, Nepal MICS 2019, Pakistan NNS 2017-8, Sri Lanka DHS 2016; South Asia UNICEF, WHO and World Bank Joint Malnutrition Estimates, 2020 edition.

are affected by conflict and recurrent natural disasters; however, the overwhelming majority of wasted (and stunted) children live in a development context.

Almost all of South Asia's wasted children are in five countries: India, Pakistan, Bangladesh, Afghanistan and Nepal. The national wasting prevalence hovers just below 10% in Afghanistan, Bangladesh and the Maldives, exceeds 10% in Nepal, and exceeds 15% in Pakistan, Sri Lanka and India (Figure 2). No country is on track to achieve the World Health Assembly target to maintain wasting below 5% by 2025 or below 3% by 2030 (Development Initiatives, 2020). In fact, the 2020 Global Nutrition Report found that there is "no progress or a worsening situation" in Afghanistan, India, Sri Lanka, the Maldives and Pakistan.

The context of child wasting in South Asia has several unique characteristics compared to other regions where the wasting prevalence is also high, such as sub-Saharan Africa. They include the very high prevalence and incidence of wasting at birth and in early life, the more prolonged periods of wasting that children experience in the first two years of life, the higher prevalence of concurrent stunting and wasting, and the relatively low post-neonatal mortality rate. It is important to understand these issues, because they influence the policy discourse on wasting prevention and treatment in the region.

The prevalence of wasting in South Asia is higher at birth than any other time in early childhood, which suggests that poor maternal nutrition and/or health are key drivers of wasting in the region (Ashorn et al, 2018). South Asia has the highest prevalence of low birth weight (27%) in the world; almost double that of sub-Saharan Africa (14%), the next highest region (UNICEF and WHO, 2019). One in five women are thin (body mass index <18.5 kg/m<sup>2</sup>) and one in 10 women has a short stature (<145 cm) (Goudet et al, 2018), both of which are risk factors for child wasting in South Asian countries (Harding et al, 2018b). This is also much higher than in sub-Saharan Africa. In East and Southern Africa, an estimated 12.5% of women are thin and only 2.5% have a short stature, while in West and Central Africa 11% of women are thin.<sup>1</sup> Adolescent pregnancy is common in South Asia (11%), particularly in Afghanistan (20%) and Bangladesh (24%), although it is not as high as in sub-Saharan Africa (26%).<sup>2</sup>

Two recent studies examined longitudinal datasets of child wasting and stunting from South Asia, Africa and Latin America (Mertens et al, 2020a and 2020b). They found that South Asia has the highest prevalence of wasting at birth (19% in South Asia, compared to 8% in Africa), and the highest prevalence and incidence of wasting at all ages up to 24 months. Seasonality had a larger influence on wasting at birth in South Asia than in Africa. In fact, mean weight-for-length z-score at birth varied by almost a full standard deviation, depending on the month a child was born. This suggests that there are

seasonal influences on food security in South Asia that impact on intrauterine growth restriction or preterm birth. In both South Asia and sub-Saharan Africa, the longitudinal analysis found that the highest incidence of wasting occurred in the first three months of age, even after excluding episodes of wasting at birth. Children who were wasted in their first six months of life were more likely to suffer wasting and stunting in later life. Early wasting also increased the risk of death by 24 months, with "persistent" wasting under six months of age (defined by the authors as at least 50% of child measurements wasted), severe underweight under six months of age, and concurrent wasting and stunting most strongly associated with death.

These findings call for much greater attention to preventing wasting at birth and during the first six months of life in order to reduce the prevalence and caseload of wasting and its associated mortality and development risks. South Asia outperforms all other regions on exclusive breastfeeding; however, the stakes are high for the 43% of infants less than six months old who are not exclusively breastfed, particularly those born small or preterm. In addition, only 40% of newborns in South Asia benefit from early initiation of breastfeeding (compared to 52% in sub-Saharan Africa)<sup>3</sup> at a time of life when they are most vulnerable to wasting. By two years of age, the longitudinal analysis found that half (50%) of children in South Asia had experienced at least one wasting episode, compared with only 28% in Africa. One of the likely contributing factors is the poor quality of children's diets in South Asia: only 12% of children aged 6-23 months consume diets that meet minimum acceptable standards.<sup>4</sup>

The same analysis revealed a higher proportion of children who were "persistently" wasted in the first two years (7% vs. 2%) in South Asia, and the highest proportion of concurrent wasting and stunting in this region, peaking at 7-8% in children 18-24 months (2% in Africa). Concurrent wasting and stunting is a highly vulnerable state that carries a similar mortality risk to severe wasting (McDonald et al, 2013; Myatt et al, 2018). In the past there has been a tendency to address wasting and stunting in isolation – often with wasting considered a humanitarian problem and stunting a development concern. However, it is apparent that these two conditions are closely related, with repeated or prolonged periods of wasting resulting in linear growth failure and stunting.

Wasting and stunting share several common predictors in South Asian countries (maternal undernutrition and poor health, low birth weight, and poor diets in infancy and early childhood) and often affect the same child (Harding et al, 2018b; Torlesse and Aguayo, 2018). Indeed, low birth weight is a predictor of being concurrently wasted and stunted in South Asia, while in India poor complementary feeding is also associated with the co-occurrence of stunting and wasting (Harding et al, 2018b). These findings call for integrated programming that brings the wasting and stunting agendas together to address both

forms of undernutrition across the lifecycle.

Some researchers argue that the mortality risks of severe wasting may be lower in South Asia than other regions because post-neonatal mortality rates are relatively low in the region, despite the high prevalence of wasting and severe wasting (UNICEF, 2018). However, the analysis of longitudinal data by Mertens et al (2020b) found that early growth failure, persistent wasting and concurrent wasting – all common conditions in South Asia – were associated with increased mortality.

More research is needed to understand the relationship between mortality and wasting in South Asia, how it is affected by the context, and its implications for policies and programming. What is clear is that the mortality risks are not low enough to ignore, and even if more children survive wasting and severe wasting in South Asia, there are potentially long-term deleterious consequences for linear growth, cognition and learning.

Studies in India have also reported that severely wasted children without medical complications respond more slowly to treatment than in Africa (Prost et al, 2019); perhaps because they are younger, have more severe wasting episodes, or have different body morphologies which mean that weight-for-length cut-offs capture different severities of wasting across different populations (Post et al, 2001). These findings may reflect regional differences in wasting aetiology, but also require further investigation.

## Policy and programme response to child wasting in South Asia

Nutrition is currently high on the political agenda in South Asia and most countries are implementing multi-sector national nutrition plans to meet global nutrition targets. However, wasting has not attracted sufficient attention in the design and implementation of these plans, as is evident in the slow progress to prevent wasting and the very low coverage of services to treat severely wasted children. In countries that are members of the Scaling Up Nutrition (SUN) Movement (Afghanistan, Bangladesh, Nepal, Pakistan, Sri Lanka and selected states in India), this may stem from the primary focus of the movement on stunting reduction. Indeed, there has been a tendency in some countries to separate, rather than integrate and align, efforts to address stunting and wasting.

In addition, South Asia has not attracted the same level of donor support or non-governmental organisational presence to address wasting as sub-Saharan Africa. The transition of South Asian countries to middle-income status, and

<sup>1</sup> Unpublished estimates prepared by UNICEF East and Southern Africa Regional Office (does not include data from South Sudan, Somalia and Angola) and UNICEF West and Central Africa Regional Office.

<sup>2</sup> Percentage of women aged 20-24 years who gave birth before 18 years of age. Data available from <https://data.unicef.org/topic/child-health/adolescent-health>

<sup>3</sup> UNICEF database on infant and young child feeding available from: <https://data.unicef.org/resources/dataset/infant-young-child-feeding/>

<sup>4</sup> See preceding footnote.



the concentration of donor support to humanitarian crises in sub-Saharan Africa and the Middle East, may partly explain why South Asia's immense wasting challenge has received disproportionately low attention from donors and the global nutrition community. While this could be viewed as an opportunity to build strong government leadership and ownership of the wasting agenda in South Asia, unresolved questions on how countries can afford to deliver interventions at scale, particularly for wasting treatment, is a drag on progress.

Here we describe the current policy and programme response in the six countries with the highest wasting burdens (Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka). We focus predominantly on the treatment of wasting (Table 1 and Box 1), because preventive actions have received relatively more attention by governments and partners in most country contexts (with the possible exception of Afghanistan and Pakistan), thanks to the global, regional and country efforts to reduce stunting. That said, we recognise that the prevention of wasting should be the first priority in order to lower the number of children requiring treatment, and because children who recover from wasting have a higher risk of poor growth and neurocognitive development (Black et al, 2013). In particular, the evidence calls for intensified action in South Asian countries to improve the nutrition of women and their infants during the 500 days between conception and six months postpartum. There is also need to improve complementary feeding, as practices in the region

**Table 1** National policies and strategies to care for severely wasted children

	AFG	BGD	IND	NPL	PAK	SLKA
<b>Integration into the health system</b>						
Care of wasting in national health policy	Yes	Partially	Yes	Partially	Yes	Partially
Costed plan for care of wasting	Yes	Partially	Yes	Partially	Yes	Partially
National guidelines for care of wasting	Yes	Partially	Yes	Partially	Yes	Partially
National guidelines incorporate WHO 2013 recommendations	Yes	Partially	Yes	Partially	Yes	Partially
National guidelines for care of wasting include infants < 6 months of age	Yes	Partially	Yes	Partially	Yes	Partially
Pre-service training curriculum on management of wasting	Yes	Partially	Yes	Partially	Yes	Partially
RUTF on essential medicine list	Yes	Partially	Yes	Partially	Yes	Partially
Performance indicator on treatment services in routine information system	Yes	Partially	Yes	Partially	Yes	Partially
<b>Management services</b>						
Inpatient care of severe wasting	Yes	Partially	Yes	Partially	Yes	Partially
Outpatient care of severe wasting	Yes	Partially	Yes	Partially	Yes	Partially
Community-based case management of severe wasting	Yes	Partially	Yes	Partially	Yes	Partially
RUTF used for outpatient treatment	Yes	Partially	Yes	Partially	Yes	Partially
Management of 'at risk' infants <6 months of age at community level	Yes	Partially	Yes	Partially	Yes	Partially
Outpatient management of moderate wasting with supplementary food	Yes	Partially	Yes	Partially	Yes	Partially
	Yes	Partially	Yes	Partially	Yes	Partially

AFG = Afghanistan; BGD = Bangladesh; IND = India; NPL = Nepal; PAK = Pakistan; SLKA = Sri Lanka.

are very poor and better diets could reduce the incidence of wasting after six months. Maternal nutrition is further explored in this edition of *Field Exchange*<sup>5</sup> and in a recent edition of the ENN publication *Nutrition Exchange*<sup>6</sup> which examined actions to improve the diets of young children in South Asia.

Only three countries (Afghanistan, Nepal and Pakistan) have national policies and guide-

lines for the treatment of wasting that are largely in line with the 2013 WHO recommendations (WHO, 2013), including the use of ready-to-use therapeutic foods (RUTF) to treat uncom-

<sup>5</sup> See views article in this edition entitled "Improving Maternal Nutrition in South Asia: Implications for Childhood Wasting Prevention Efforts".

<sup>6</sup> *Nutrition Exchange South Asia: Young Children's Diets in South Asia*. June 2020, Issue 2. Available from: [www.ennonline.net/nex/southasia](http://www.ennonline.net/nex/southasia)

## Box 1 Treatment of severe wasting in South Asian counties

**Afghanistan:** Child wasting is a priority in the National Public Nutrition Strategy and the Afghanistan Food Security Nutrition agenda. The community-based programme for the management of child wasting is part of the Basic Package of Health Services (BPHS) and Essential Package of Hospital Services (EPHS). While ready-to-use therapeutic food (RUTF) procurement remains reliant on humanitarian funding, the treatment of severe wasting is otherwise well integrated into the health system, and this has enabled significant scale-up of services (coverage of up to 50% of severely wasted children). The country is currently working on the simplification of the national protocol and will pilot the use of 'family MUAC' (mid-upper arm circumference) and reduced dosage of RUTF in selected provinces in response to shortages of funding for RUTF.

**Bangladesh:** Bangladesh has national guidelines for both facility and community-based management of severe wasting. However, only inpatient services are provided at facility level as treatment with commercial RUTF is not permitted (except for the Rohingya response in Cox's Bazaar) and no alternative has been identified. As a result, the coverage of treatment services remains persistently low. Researchers in Bangladesh are seeking to test the effectiveness of locally prepared RUTF recipes that comply with World Health Organization (WHO) specifications. Given the high prevalence of low birth weight and wasting in early life, the country has piloted an innovative approach for the management of

infants and mothers at risk of wasting at community level.

**India:** In India the inpatient management of child wasting is provided in nutrition rehabilitation centres (NRCs), following the 2013 guideline on facility-based management of severe acute malnutrition. More recently, there has been experience in integrating inpatient management of child wasting in inpatient paediatric services, which could be a more scalable approach. A draft guideline for the community-based management of acute malnutrition (CMAM) was developed in 2017, but as yet has not been released. There are ongoing scientific and policy debates on the aetiology of wasting in India and how best to manage severe wasting (including opposition by some coalitions to the use of commercial RUTF to treat severe wasting) that have not been resolved. This lack of consensus is delaying the introduction and scale-up of services to manage severe wasting at community level. However, 13 out of 29 states are expanding or planning to expand the management of wasted children from NRCs to communities, using different approaches and strategies, including local alternatives to RUTF in some states.

**Nepal:** Community-based management of acute malnutrition (CMAM) was introduced in Nepal in 2008 in response to the floods in Terai. Since then, the country has gradually scaled up coverage by including CMAM in its first (2013-17) and second (2018-22) Multi-Sectoral Nutrition Plans. The scale-up of the CMAM programme in Nepal is a positive

example of how the management of child wasting has been transformed from a humanitarian to a development programme, integrated into health services, but with the capacity to expand in the event of emergencies. The programme is owned and led by the government, with technical support provided by the national coordination group on nutrition composed of UN agencies and non-governmental organisations. Currently, the programme covers 28 out of 77 districts, but only reaches an estimated <5% of Nepal's severely wasted children.

**Pakistan:** Pakistan's 2013 guidelines on CMAM are currently under revision. The country introduced the CMAM approach during the 2005 emergency response to the Azad Kashmir earthquake. Since then, Pakistan has been working to expand from a humanitarian-focused programme to development programming for the prevention and treatment of child wasting. This involves integrating services into the health system, a process that is still underway, and ensuring appropriate linkages with national initiatives to reduce stunting.

**Sri Lanka:** Sri Lanka has a national guideline for the management of severe wasting that includes community-based management with RUTF (BP100). However, the outpatient treatment of severe wasting has only been decentralised to the district-hospital level. Only paediatricians are authorised to prescribe therapeutic food, which restricts access, particularly for severely wasted children living far from district hospitals.

## Box 2 Programmatic adaptations to services to prevent and treat COVID-19 in South Asian countries

- Use of 'family MUAC' or 'mother's MUAC' to enable family members to screen their children for acute malnutrition using mid-upper arm circumference tapes.
- Increase the spacing of beds for children in inpatient settings.
- Reduce the frequency of outpatient follow-up visits for children with severe wasting.
- Provide counselling to women and caregivers on dietary intake during pregnancy, breastfeeding and complementary feeding through remote mechanisms (e.g., WhatsApp and phone helplines).
- Orient and train health workers on programmatic adaptations through WhatsApp and other remote platforms.
- Preposition supplies of nutrition commodities to mitigate against supply-chain breaks.

plicated cases of severe wasting at community level. The programmes in these three countries began as humanitarian responses and are at various stages of integrating treatment into routine health services, but coverage is severely constrained by a lack of funding, particularly for RUTF. Afghanistan is largely dependent on short-term humanitarian funding (Food for Peace, United States Government (FFP/USG)), and this has enabled the country to achieve up to 50% coverage of children with severe wasting – the highest in the region but still far short of universal coverage. Further, this coverage is fragile, as attempts to leverage multi-year and/or development funding have not been successful. Ideally, the funding for procurement of RUTF should be included in the government's Basic Health Service Package (BHSP) in Afghanistan; however, concerns regarding the size of the budget line has meant there has been no agreement to date. In Pakistan, both FFP/USG (for humanitarian needs only) and the government fund RUTF, although the programme is severely underfunded and coverage is therefore very low (<5%). In Nepal, the government now has a budget line for RUTF and is poised to take over financial support from the European Union and UNICEF, but again the needs outstrip financial resources and coverage remains below 5%. None of these three countries has included RUTF in its essential medicines list, and the funding gaps to bring these services to scale have not been quantified, although work is underway to address these gaps.<sup>7</sup>

Both India and Bangladesh have inpatient services to treat severe wasting. However, neither country has fully adopted WHO recommendations on the management of severe wasting, including the treatment of uncomplicated cases at community level using RUTF formulations that meet WHO specifications. In Bangladesh, the reliance on inpatient treatment severely constrains access to treatment as the opportunity costs of inpatient care are high, particularly for vulnerable families. The one exception is the response to the Rohingya crisis in Cox's Bazaar, where community-based management of severe wasting with RUTF is in place. In India, some states are implementing community-based management of severe wasting using a range of nutrition products that are financed by the government and (in a few states) by philanthropic foundations.<sup>8</sup> In addition, take-home rations (for children aged 6-35 months) or mid-day meals (for children aged 3-6 years) are provided

by the government-financed Integrated Child Development Services (ICDS) in India; children who are severely underweight receive a double ration (de Wagt et al, 2019). Sri Lanka has both inpatient and outpatient management of severe wasting, also largely funded by government, but services are only provided up to the district level, again constraining access to treatment.

Public officials and academics in Bangladesh and India raise a number of concerns regarding global recommendations on how child wasting is managed. One is on RUTF, including the cost of managing severely wasted children with RUTF at scale; the cost-effectiveness, given the relatively low post-neonatal mortality rate; the suitability of the product for South Asian children, in particular its nutrient content and cultural appropriateness; the existence of alternative food products, such as the food rations provided by the ICDS in India, that cater to severely underweight children; the relatively stronger health-service platforms in countries (compared with sub-Saharan Africa) that enable children to be detected and referred to inpatient care if needed; and the epidemiology of wasting (which, the officials and academics argue, calls for a rebalance of efforts to prevent maternal malnutrition and infant wasting in the first six months). We do not examine these arguments in this article, except to say that there is an urgent need to convene the academic community to build a stronger evidence base that can objectively inform policies and programmes to treat severe wasting in South Asia and to inform the global normative guidance; which, as acknowledged by WHO (2013), is largely based on evidence from sub-Saharan Africa.

It is important to balance the policy discourse on wasting in the region, which should encompass much more than the 'product' used to treat severe wasting. In the context of South Asia, we must examine the continuum of care from pregnancy to child to bring down the numbers of wasted children requiring treatment, and from the early detection of wasting to treatment and prevention of relapse. We are currently missing opportunities to identify wasted children because some countries in the region are not using mid-upper arm circumference (MUAC) as a screening tool and instead rely on weight-for-height only, which is challenging to measure at community level. Recent evidence that weight-for-age may identify children at high risk of death (Mertens et al, 2020b) is encouraging as

growth monitoring is implemented in all countries. Community-based systems and services to treat wasting are still often delivered vertically and in isolation from interventions that prevent stunting and wasting, and more integrated approaches are needed. In some countries, such as Afghanistan, services to manage moderate wasting are not systematically linked to services treating severe wasting. Elsewhere, there is often a lack of services to aid the recovery of moderately wasted children, including caregiver counselling, and prevent deterioration to severe wasting. It is essential to address the disjoint in approaches and design services in a way that enables a comprehensive, child-centred approach across the continuum of care from prevention to treatment.

For infants less than six months of age, countries across the region have integrated the care of low-birth-weight infants into neonatal services at health facilities. A greater concern is the continuity of care when these infants are discharged into the community (or for children born at home) and the early identification and care of infants who are or who become nutritionally vulnerable in early infancy. All six countries have national guidelines for the inpatient care of wasting in infants less than six months of age, but no country currently has national programmes to manage nutritionally at-risk infants and their mothers at community level. However, India is providing home-based care for children born with low birth weight,<sup>9</sup> and Afghanistan, Bangladesh and India are actively exploring how to introduce programmes to manage nutritionally at-risk infants and their mothers at community level. Outstanding issues are how best to identify these nutritionally vulnerable infants and how to ensure their mothers receive support, given the service entry point is often centred on paediatric care.

Many of these issues were raised during the regional conference convened by the South Asia Association for Regional Cooperation (SAARC) and UNICEF on "Stop Stunting – No Time to Waste" in 2017.<sup>10</sup> This landmark event brought together countries from across South Asia to discuss and agree actions to scale up the care and treatment of severely wasted children. The conference concluded with a Call to Action<sup>11</sup> to guide policy and programming action to reduce child wasting, which was endorsed by the SAARC Ministers of Health later the same year. The central premise of this Call to Action is that the prevention of wasting and stunting is the priority in all contexts, development and humanitarian, given the very high prevalence

<sup>7</sup> See news item in this edition entitled "Tackling child wasting: a review of costing tools and an agenda for the future".

<sup>8</sup> See field article in this edition entitled "Community management of acute malnutrition in Rajasthan, India".

<sup>9</sup> See field article in this edition entitled "Managing at risk mothers and infants under six months in India – no time to waste".

<sup>10</sup> [http://stopstunting.org/regional-events/regional\\_conference-2017](http://stopstunting.org/regional-events/regional_conference-2017)

<sup>11</sup> See Call to Action in the report summary in this edition entitled "Report of the South Asia 'Stop stunting: No time to Waste' conference".



and burdens in the region and costs of these conditions to children, families and nations. But, when children become wasted, it is essential that they are identified early and treated, which is best achieved through a combination of community-based treatment for those without medical complications and facility-based treatment for those with medical complications.

This Call to Action remains relevant and we expect it to be reflected as the region and high-burden countries move forward under the Framework for Action of the United Nations Global Action Plan on Wasting<sup>12</sup> (hereafter referred to as the “GAP Framework”) to develop country Roadmaps for Action towards the Sustainable Development Goal target on wasting. These country Roadmaps for Action will be developed under the leadership of national governments and will identify a set of priority actions needed to accelerate progress on the prevention and treatment of wasting. These actions should be integrated into broader, multi-sector national nutrition policies, strategies and plans at the earliest opportunity to ensure appropriate linkages with actions to prevent all forms of malnutrition.

### Child wasting and COVID-19

Since early 2020, the COVID-19 pandemic has upended the lives of millions across the region (Ingram, 2020). The massive loss of jobs and income, combined with disruptions in the production, transportation and sale of affordable foods, have severely impacted the ability of vulnerable households to feed their families. For example, a study conducted among urban poor households in Bangladesh in April 2020 found that 75% experienced a fall in income, 28% experienced a fall in food expenditure, and 24% were no longer able to consume three meals a day (PPRC & BIGD, 2020). Social protection systems are unable to meet the growing needs of impoverished families, which are likely to persist for many months following the removal of lockdown measures.

The impact on child wasting is deeply concerning. Estimates released in July 2020 suggest that, in the absence of timely action, an additional 6.7 million children will become wasted globally, an increase of 14.3%, and more than 10,000 children will die each month as a result. (Headey et al, 2020). Worryingly, the authors predict that South Asia will be most affected – of the predicted additional 6.7 million wasted children, 3.9 million (58%) will be in South Asia. It is challenging to obtain actual data on nutritional status at this time as these measurements require physical contact with a child; however, Afghanistan has continued to measure children at health facilities and recorded a 13% increase in number of wasted children between January (690,000) and May (780,000) alone.<sup>13</sup>

Overwhelmed health systems have struggled to continue providing essential services to prevent and treat wasting and to reassure families to use them. In countries across the region, preventive nutrition services (e.g., nutritional care

of women during antenatal care, support and counselling on breastfeeding and complementary feeding, and vitamin A supplementation) were often the first to be deprioritised following lockdown measures. A study conducted in nine hospitals in Nepal found that the percentage of newborns who were breastfed within one hour of birth decreased by 3.5% during the early weeks of lockdown (Ashish et al, 2020). Fear of the contagion meant that some women in maternity facilities and isolation centres were separated from their breastfeeding infants, severely compromising the initiation and continuation of breastfeeding. Wasting treatment services were closed or considerably reduced to free up staff time and space to treat COVID-19 patients. For example, by May 2020 data from routine information systems showed that inpatient admissions for severe wasting were over 40% lower in Afghanistan and 75% lower in Bangladesh compared to May 2019, and outpatient services ground to a halt in Nepal.

However, by June 2020, most countries were reversing the downward trend in admissions for severe wasting. Country, regional and global nutrition communities have truly come together to identify pragmatic solutions to enable the delivery of essential nutrition services to continue. Ministries of health across the region reprioritised and resumed essential nutrition services as soon as measures were in place to do so as safely as possible. Many have adapted global guidance on the nutritional care of children in the context of the COVID-19 pandemic to their country contexts, including guidance on the treatment of wasting. They have introduced a range of programmatic adaptations to enable the continuation of services to prevent and treat wasting while minimising the risks of COVID-19 transmission (Box 2).

While essential nutrition services have since been able to resume in most settings, they are not yet back to prior capacity. Thousands of children have slipped into wasting as a result of the indirect impacts of the pandemic and have missed out on treatment when they needed it most. As countries continue to grapple with the pandemic, and the threat of further lockdown measures and economic hardship continues, it is essential that governments and their partners take action to prevent more children from becoming wasted, and to treat those that do.

In July 2020 the heads of UNICEF, the Food and Agriculture Organization (FAO), the World Food Programme (WFP) and WHO issued a global Call for Action to protect children’s right to nutrition in the face of the COVID-19 pandemic. They identified actions that should be taken and tracked immediately to protect children’s right to nutrition. These included actions to:

- Safeguard and promote access to nutritious, safe, and affordable diets;
- Invest in improving maternal and child nutrition through pregnancy, infancy and early childhood;
- Reactivate and scale up services for the early detection and treatment of child wasting; and

- Expand social protection to safeguard access to nutritious diets and essential services.

The challenge now is to realise these actions in practice. This will require substantial investments from governments, donors, the private sector and the United Nations at a time of economic downturn, when the mismatch between needs and financial resources (of both donors and governments) is likely to be considerable. There is, therefore, an urgent need to contextualise this Call to Action according to each country setting in the region to focus resources on actions most likely to mitigate the impact of the pandemic on children’s nutrition.

### Reimagining care for wasted children in South Asia

The response to wasting in South Asia is clearly not commensurate with the magnitude of the problem. Global normative guidance on the treatment of severe wasting has been adopted in Afghanistan, Nepal and Pakistan, but the shortage of financial resources to cover the cost of RUTF and meet both development and humanitarian needs sustainably is a key barrier to scale. Meanwhile, there are no national programmes to treat severe wasting at community level in Bangladesh, India and Sri Lanka. In these countries, there are aspects of the global normative guidance for community-based management of acute malnutrition that some stakeholders consider inappropriate for their country contexts; yet evidence-based alternatives have not been identified. While there has been relatively greater emphasis on preventive interventions, the prevalence and incidence of wasting remains persistently high in early life because too many mothers are thin, short and young, and there is insufficient care for nutritionally vulnerable infants. This failure to prevent wasting and treat those who become wasted is robbing the opportunities of this generation’s children to survive, grow, develop and thrive.

At the same time, South Asia offers a wealth of capacity and opportunities to think and do things differently, and to help drive innovative approaches that may not only inform policies and programmes to prevent and treat child wasting in South Asian countries, but benefit other regions, too.

**Government leadership and ownership of the prevention and treatment of child wasting** should be at the core of all efforts. Government leadership is critical in all contexts – development and humanitarian – and at all levels. We must do more to bring leaders’ attention to the harmful consequences of inaction on wasting and to the potential returns on investing public resources. However, countries should not address wasting in isolation. Instead, they should ensure that actions to prevent and treat wasting (including those identified in country Roadmaps for Action

<sup>12</sup> See views article in this edition entitled “UN Global Action Plan (GAP) Framework for Child Wasting and the Asia and Pacific Region”.

<sup>13</sup> [www.unicef.org/press-releases/unicef-comment-malnutrition-afghanistan-geneva-palais-briefing](http://www.unicef.org/press-releases/unicef-comment-malnutrition-afghanistan-geneva-palais-briefing)

as part of the operationalisation of the GAP Framework) are embedded in multi-sector nutrition strategies and plans.

The challenges are too immense for governments to act alone; nor can they rely on humanitarian funding to treat children, given its short-term horizon and failure to cater to the needs of the majority of wasted children who live in a development context. **The development community should also pay proportionate attention to South Asia** in terms of technical assistance and funding to unravel the most pressing challenges. This includes leveraging the global health as well as nutrition communities. A crucial step in leveraging financial resources for wasting prevention and treatment is to understand the costs involved.

**Preventive actions should be positioned at the centre of national efforts to reduce the number of wasted children.** Greater priority must be given in South Asia to improving the nutritional and health care of women before and during pregnancy to prevent low birth weight and for their own health and wellbeing; to strengthening the nutritional care for low-birth-weight infants and their mothers, both at facility and community level; to improving breastfeeding and complementary feeding practices in the first two years of life; and to identifying and referring children who become wasted. The health system plays a primary role in delivering these nutrition interventions, but convergent actions by the food, social protection and water and sanitation systems are also needed to improve the access of vulnerable households to safe, nutritious and affordable diets and the capacity of caregivers to care for their children during the

crucial early years. We still have much to learn on how to deliver services that prevent wasting, so preventive actions should be coupled with knowledge generation to iteratively learn what works and how.

We must **strengthen the integration of the care of wasted children into the health system across a continuum of care that spans the prevention and treatment of moderate and severe wasting.** For some countries, this needs to begin with policy consensus on evidence-based approaches to treat wasting at community level. In all contexts, interventions to prevent and treat wasting should be considered a part of the essential healthcare package and be appropriately reflected in policies, plans, budgets, health workers' pre-service training, supply-chain management, and health management information systems.

Finally, we need to **continue to build the evidence base on the epidemiology of child wasting in South Asia and on effective models of care across the prevention and treatment continuum.** We must clearly define and target the evidence gaps that are stifling policy and programme action. In particular, implementation research is needed to examine the effectiveness of alternative models and innovative approaches to care for wasted children that build on existing systems and service-delivery platforms and which have genuine potential for scale. There is also a need for open forums to discuss the evidence and its interpretation, and to drive consensus-based and evidence-driven policy and programme decisions.

We truly believe that there is immense need and potential for research and the ongoing

evidence debates in South Asia to contribute to both regional and global efforts to optimise and innovate sustainable and scalable approaches to care for children with wasting. To this end, the UNICEF Regional Office for South Asia (ROSA) has formed a Technical Advisory Group (TAG), comprising leading regional and global experts, to examine the existing evidence from South Asia and to help address the evidence gaps that are blocking solutions for South Asia's children.<sup>14</sup> The TAG will also advise on the implications of new evidence for the design of policies and programmes in South Asia, and global operational and normative guidance.

As countries continue to grapple with the COVID-19 pandemic and its knock-on effects on livelihoods, income and services, we must accept that business cannot continue as usual for South Asia's wasted children. The crisis may, in fact, be the long overdue catalyst that forces national government and development partners to rethink how we focus resources to prevent and treat child wasting in South Asia. Now, more than ever, we must identify what will be most impactful at a time of multiple needs and how to effectively reach the region's most vulnerable children, and greatly enhance our efforts to secure both domestic and external financial resources. It is time to bring greater visibility to child wasting in South Asia and to build the commitment of national and international actors to more purposefully resolve the challenges that are holding back progress.

<sup>14</sup> See news article in this edition entitled "South Asia Technical Advisory Group on Wasting".

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## Integration of essential nutrition interventions into primary healthcare in Pakistan to prevent and treat wasting: A story of change

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Children at a supplementary feeding programme, Pakistan

## PAKISTAN

**What we know:** Child wasting levels remain extremely high in Pakistan and coverage of wasting treatment services is low.

**What this article adds:** Community-based management of acute malnutrition (CMAM) was first implemented in Pakistan in 2005 as an externally funded, standalone intervention in response to the Azad Kashmir earthquake, and later in response to subsequent crises in Punjab and Sindh provinces. In 2010 the Government of Pakistan (GoP) developed national CMAM guidelines (updated in 2015), used to guide CMAM programming in priority districts, co-funded by GoP and external partners from 2011 onwards. The programme was delivered through a government health service delivery platform, but was vertical with its own workforce, supply chain and information management system. In October 2018 external partners capitalised on the GoP's signing of the Astana Declaration on Universal Health Coverage and advocated for inclusion of a package of essential nutrition-sensitive actions (including CMAM) in the public health system. This approach has been accepted by the GoP and the essential nutrition package is being costed to inform resource allocation for stepwise rollout. Plans are being made to develop the capacity of the health workforce (including lady health workers – Pakistan's cadre of community health workers) to deliver services and integrate CMAM supplies and data into the routine supply chain and information systems.

## Background

Pakistan is the sixth most populous country in the world (Statistics PBo, 2018), with an estimated 39% of the population affected by poverty (GoP, 2018). Child undernutrition remains a persistent public health problem, contributing to high child mortality rates (currently 74 deaths per 1,000 live births) and hampering socio-economic development. A cost-of-hunger study carried out by the Government of Pakistan (GoP) and World Food Programme (WFP) in 2017 revealed that Pakistan is losing USD7.6 billion annually as a result of the costs of malnutrition, corresponding to 3% of gross domestic

product (GDP). The rates of wasting (acute malnutrition) and stunting (chronic malnutrition) in children under five years old remain very high in Pakistan, at 17.7% and 40.2% respectively (GoP and UNICEF, NNS 2018). While a very slow but downward trend is observed for prevalence of stunting among young children, prevalence of wasting has shown a steady upward trend over the last three decades, increasing from 12.5% in 1990 to current levels of 17.7% (Figure 1). The prevalence of severe wasting or severe acute malnutrition (SAM) has also increased, from 5.8% in 2011 to 8.0% in 2018 (GoP and UNICEF, NNS 2011, 2018).





Mothers receiving a cash-based transfer in Pakistan

WFP/Houman Hadad

Child undernutrition in Pakistan has multiple complex causes. An important driver at individual level is maternal undernutrition, which is a major cause of high levels of low birth weight (LBW) in the country (around 20%). Maternal undernutrition is reflected in prevalent anaemia, (42.7%), vitamin A deficiency (22.4%), vitamin D deficiency (54%), wasting (14.4%), and overweight and obesity (38%) among women of reproductive age (GoP and UNICEF, 2018), as well as low uptake of iron and folic acid (IFA) supplementation among pregnant women (32.9%). Early marriage and low maternal education are also associated with child undernutrition (Khan et al, 2019). Sub-optimal infant and young child feeding (IYCF) practices are also highly prevalent, with only half of infants under six months exclusively breastfed and less than one in 20 (3.5%) infants over six months receiving complementary foods that meet the requirements of a minimum acceptable diet. Other underlying causes of undernutrition in Pakistan include food insecurity (58% of households are estimated to be food-insecure (GoP MPDR, 2018), inadequate care, inadequate access to and utilisation of social basic services, and widespread poverty.

To increase the coverage of child wasting treatment and thereby contribute to the reduction of child morbidity and mortality, the GoP adopted and began implementing Community-based Management of Acute Malnutrition (CMAM) from 2005. CMAM was initially implemented as a standalone emergency nutrition intervention, later evolving into a government-owned intervention that is now being integrated into primary healthcare for countrywide roll-out. This article describes the evolution of this process, key enablers, barriers and lessons learned.

### Evolution of the approach to wasting treatment in Pakistan *CMAM as a donor-funded, standalone emergency response*

Over the last 15 years Pakistan has endured several major, unprecedented disasters; some natural (earthquakes, floods and droughts) and others man-made (widespread militancy and resulting operations), with devastating impacts on food and health systems. In 2005 an earthquake in Pakistan-administered Azad Kashmir

and adjacent Khyber Pakhtunkhwa led to floods in Jhal Magsi Balochistan and internal displacement into Khyber Pakhtunkhwa province. To tackle resulting high levels of wasting, Pakistan implemented its first CMAM programme. Core elements of the programme included community screening, inpatient care for complicated cases of SAM, and outpatient management of uncomplicated SAM and moderate acute malnutrition (MAM) through use of ready-to-use therapeutic food (RUTF) and ready-to-use supplementary food (RUSF) respectively. The primary aim of this decentralisation of treatment was to rapidly increase the coverage of wasting treatment services beyond levels achieved through facility-based programming alone. This was a vertical, standalone, life-saving emergency response that was mainly dependent on external donor funding and humanitarian agencies.

Between 2005 and 2011 CMAM programming was implemented in response to multiple emergency situations in Pakistan; all as donor-funded, vertical, life-saving responses. This included the response to the monsoon flash floods and riverine in 2010 and 2011 in Punjab and Sindh provinces, devastating one third of the country and resulting in widespread displacement, disruption of social services, livelihoods and agriculture, and inflicting vast infrastructural damage. The Nutrition Cluster was rapidly established at provincial and district levels to coordinate the nutrition response in affected areas and CMAM was implemented by externally funded non-governmental organisations (NGOs) and United Nations (UN) agencies, partially delivered through available government health service delivery structures.

The success of the nutrition emergency response in averting a significant number of deaths brought the spotlight on the CMAM approach in Pakistan. To avoid the suspension of nutrition services post-emergency and continue building on the gains made during the crisis, the Government of Pakistan (GoP), with support from the United Nations Children's Fund (UNICEF), World Food Programme (WFP), World Health Organization (WHO) and NGOs, developed Pakistan-specific CMAM guidelines in 2010 (updated in 2015). The purpose of the guidelines was to provide a framework to guide the management of acute

malnutrition. However, implementation of the guidelines was mainly limited to emergency response, and wasting treatment (as with other nutrition interventions) was not integrated into the routine package of health services.

### *CMAM as a government-funded vertical programme*

In 2012, the GoP initiated CMAM in selected emergency and non-emergency districts based on results of the 2011 National Nutrition Survey (NNS), district population size and availability of funds from the government and external donors (mainly World Bank). In the provincial nutrition projects (PC1) developed for 2016–2019, CMAM covered all 36 districts in Punjab, nine districts in Sindh, seven districts in Balochistan and several districts in Khyber Pakhtunkhwa. Punjab has since extended its CMAM programme to the entire province, alongside a stunting prevention programme in selected districts of south Punjab. Similarly, Sindh has continued CMAM programming through an accelerated action plan (AAP) covering 12 districts, 10 of which include CMAM programming supported with funds from the European Union Programme for Improved Nutrition in Sindh (PINS). CMAM programming has also continued and has been extended in Khyber Pakhtunkhwa and is in the process of extension (through renewal of the PC1) in Balochistan. In this model the identification of children with wasting is the entry point for all nutrition services, including infant and young child feeding (IYCF) promotion, micronutrient powder supplementation and SAM treatment.

In this system, CMAM continued to be implemented as a vertical programme, located 'under the same roof' as health services within each province, but with separate staff (management staff and a separate cadre of nutrition assistants), supply chain and information management system not integrated within existing government systems. Challenges to this way of working included a fragmented information system, weak supply and logistics management, and reliance on short-term funding grants, resulting in a lack of sustainability. Programme coverage therefore remained limited; in 2019 around 265,000 children were treated countrywide for SAM and 157,000 children were treated for MAM, with an overall coverage of around 5%.

### *Opportunity to mainstream nutrition-specific interventions into Pakistan's routine package of primary healthcare services*

In October 2018 the GoP fully endorsed the Astana Declaration on public healthcare revitalisation<sup>1</sup> and initiated actions to revisit the primary healthcare approach to drive universal health coverage. This provided a unique opportunity to leverage health service delivery platforms to deliver nutrition services. Nutrition partners,

<sup>1</sup> In 2019 countries around the world agreed to the Declaration of Astana, vowing to strengthen their primary healthcare systems as an essential step towards achieving universal health coverage. [www.who.int/docs/default-source/pri-mary-health/declaration/gcphc-declaration.pdf](http://www.who.int/docs/default-source/pri-mary-health/declaration/gcphc-declaration.pdf)



**Box 1** Primary healthcare system in Pakistan

The primary healthcare model in Pakistan was first envisaged in the sixth five-year plan of the Government of Pakistan (GoP) (1983-1988). Since that time there has been considerable investment in the primary healthcare system. Now, a strong infrastructure for primary healthcare exists, managed through provincial governments, with a network of community health workers, community midwives, basic health units (BHUs) and rural health centres (RHCs). There are currently over 14,351 government health institutions in Pakistan, including 1,279 hospitals; 5,671 dispensaries; 686 RHCs, 5,527 BHUs, 747 maternal child health centres and 441 TB clinics.<sup>2</sup>

Lady health workers (LHWs) are a cadre of frontline health workers who provide services in their communities, supervised and supported by lady health supervisors, who provide services at health facilities. Hired and placed locally, the primary responsibilities of LHWs are to provide basic promotive, preventive and curative services in their communities, including family planning and maternal and child health services. LHWs receive training, support, medical supplies and pay from their closest public health facilities.

Under the 18th amendment to the constitution, the GoP has devolved many ministries to the provinces, including health and population welfare. This provides the provinces with opportunities for strategic planning as well as resource allocation and management at provincial level. Despite having a strong primary healthcare network, until now nutrition programmes have not been incorporated into the system but have worked vertically as standalone programmes, with their own workforces, supply chains and information management systems, in spite of being delivered in the same health facilities.

including the World Bank, UNICEF, WHO, and WFP, seized this opportunity to advocate to the government for the mainstreaming of wasting treatment and prevention services through the inclusion of selected nutrition-specific interventions into the routine package of services delivered at primary healthcare level. As a result, it was agreed that a 'minimum essential nutrition package' (which included wasting treatment services and key prevention and promotion services, including IYCF counselling, vitamin A supplementation, deworming and multiple micronutrient supplementation (MMS) for children and pregnant and lactating women) would become part of the Universal Health Benefits Package, delivered routinely through the government health system by the existing health workforce. Along with this, it was decided that nutrition supplies would be integrated into the health commodities logistics management system, nutrition indicators would be incorporated in the Health Management Information System (HMIS), and oversight of nutrition services would be enhanced, to enable programme sustainability.

**Process of integration**

The process of integrating the minimum essential nutrition package into the primary healthcare system

**Box 2** Disease Control Priority Approach (DCP3)

**Disease Control Priorities 3** provides a periodic review of the most up-to-date evidence on cost-effective interventions to address the burden of disease in low-resource settings. DCP3 defines a model concept of essential universal health coverage with 218 interventions that provide a starting point for country-specific analysis of priorities. Assuming steady-state implementation by 2030, essential universal health coverage in lower-middle-income countries would reduce premature deaths by an estimated 4-2 million per year.

<http://dcp-3.org/>

in Pakistan is being guided by the Disease Control Priority approach (DCP3) (Box 2), with support from a Technical Group led by the Government of Pakistan (GoP) Ministry of Health with input from United Nations Children's Fund (UNICEF). Pakistan is the first country to adopt the DCP3 and is being supported to do so with technical assistance from Liverpool University in the UK.

**Costing and resource allocation**

A cost-effectiveness analysis for the proposed package, including the minimum essential nutrition package and key health and water, sanitation and hygiene (WASH) interventions, was carried out by the Ministry of National Health Services, Regulation and Coordination (MoNHSR&C). To support the process, the Nutrition Section of the MoNHSR&C, with technical support from UNICEF, is facilitating the development of a nutrition investment case for each of the four provinces of Pakistan. Optima Nutrition<sup>3</sup> is being used to guide investment in nutrition for higher impact. This will inform advocacy for the allocation of the necessary resources to implement the management of wasting at scale in Pakistan through the primary healthcare system.

**Development of workforce capacities**

Currently, nutrition services are largely delivered by nutrition assistants at health-facility level. They are a special cadre of staff who are not on government payroll and are recruited as project staff when resources allow and laid off when financial support ends. This arrangement is far from sustainable. There is an opportunity to utilise Pakistan's army of community lady health workers (LHWs) more proactively to provide nutrition services to rapidly increase coverage in a far more sustainable way. This approach of delivering nutrition services through LHWs has been evolving in Pakistan over the last seven

<sup>2</sup> [www.pbs.gov.pk/content/health-institutions-beds-and-personnel](http://www.pbs.gov.pk/content/health-institutions-beds-and-personnel)

<sup>3</sup> Optima Nutrition is a quantitative tool that can provide practical advice to governments to assist with the allocation of current or projected budgets across nutrition programmes. <http://optimamodel.com/>

years and has now been integrated into the federal PC-1, currently being finalised, which is set to boost the coverage of nutrition services through LHWs from 60% to 80%.

To enable this approach in-service training will be required for LHWs, as well as other cadres of facility-level health staff, including health service managers. The first round of training is targeted at district-level managers; the second round is with nutrition assistants. The district-based nutrition assistant (facility-based) will then engage LHWs for a simplified version of training. A huge challenge will be the provision of quality training for such a large number of individuals. Due to the COVID-19 pandemic, rather than using a face-to-face approach, GoP and UNICEF are currently exploring options for online nutrition training. Similar plans are also being considered for pre-service health training. The quality of such training curricula has been a challenge in the past and will be an important area of focus going forward. Sufficient graduate and postgraduate human resources will also be required for the coordination and management of nutrition-service implementation. This will require advocacy for the inclusion of nutrition in the curricula of medical schools and tertiary institutions.

**Integration into government supply chain and information systems**

Local production of lipid-based specialised nutrient supplements (ready-to-use therapeutic food (RUTF) and ready-to-use supplementary food (RUSF)) for the treatment of MAM and SAM are now at advanced stages of production and are being used in the implementation of CMAM programming. To sustain local production, the GoP has passed a bill for tax exemption on imported raw materials used in RUSF production; efforts are being made to obtain similar exemption for RUTF production. This will



A programme that improves access to water through construction of wells, Pakistan

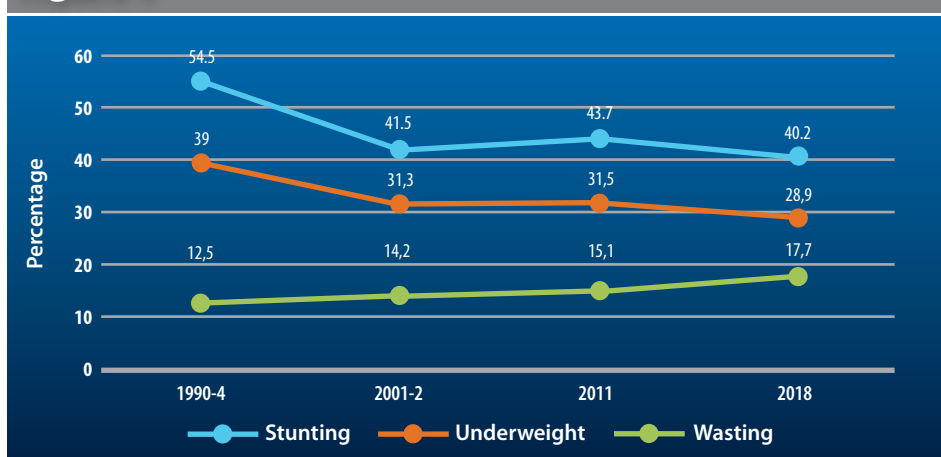
WFP/Aruman Haddad

increase the cost-effectiveness of the programme and pipeline sustainability, and will enable the expansion of production. Efforts are also underway to include imported multiple micronutrient supplementation (MMS) tablets and sachets in the essential drugs list. In addition, key prioritised nutrition indicators are currently being integrated within the existing District Health Information System (DHIS), which will fully streamline nutrition information and reporting within the government health information system.

### Institutional arrangements

In recent years there has been greater political commitment to tackle widespread undernutrition in Pakistan, leading to the development of the Pakistan Multi-Sectoral Nutrition Strategy (PMNS) 2018-2025. The PMNS aims to link and coordinate sector nutrition strategies in all four provinces of the country and optimise federal support for nutrition-specific and nutrition-sensitive programming. The Ministry of National Health Services, Regulation and Coordination is the lead ministry responsible for the delivery of nutrition-sensitive interventions in this strategy. Wasting treatment and prevention strategies are implemented through the health sector (supported by the Nutrition Section in the Planning and Development Division of the Ministry of Health). The PMNS target, in line with the Sustainable Development Goals, is to reduce and maintain childhood wasting to <5% in Pakistan by 2025, or at least to achieve a reduction in child wasting of 0.5% per year between 2018 and 2025. In emergencies, management and resource allocation is the responsibility of the National Disaster Management Authority,

**Figure 1** Childhood malnutrition trends in Pakistan



Source: 1990-4 NHS; 2001-2 NNS; 2011-NNS; 2018-NNS

which must work closely with the primary healthcare network for the delivery of surge support. Ongoing efforts to mainstream nutrition into primary healthcare through the universal health coverage approach, if successfully completed, will offer the opportunity to bring these efforts to scale to reach wasting reduction targets. Current programme coverage remains low, with less than 10% of children with SAM having access to treatment. A huge effort is required to increase coverage through a stepwise approach, starting with a focus on the areas of the country at high risk of polio; after which the focus will expand to districts with high burdens of SAM, followed by expansion to the whole country. Opportunities to integrate these efforts with ongoing social protection schemes and wasting

prevention programmes in Pakistan are being explored and leveraged.

### Conclusions

Work has been ongoing for several years to transition nutrition programming in Pakistan from emergency-driven, vertical programming to a systematic, developmental approach to address malnutrition through the primary healthcare system. Continuous advocacy and sensitisation of policymakers have driven change towards the full, nationwide integration of nutrition services into the primary healthcare system. While accepted at policy level, these changes are yet to be rolled out in practice. The immediate next step is to add wasting management to the health function of the Government's Five-Year Plan (2018-23) and National Action Plan (2019-23) and to advocate for the allocation of adequate financial resources, based on the nutrition investment case, to implement the minimum essential package of nutrition services. This government-led approach is key to enabling full coverage of wasting prevention and treatment services to meet national wasting reduction targets.

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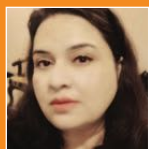
Child being screened for malnutrition in Pakistan

WFP/Rem Skallerud



# Wasting prevention and treatment - central to stunting reduction in Pakistan

By Saba Shuja, Eric Alain Ategbo, Yasir Ihtesham and Khawaja Masood Ahmed



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A mother feeds her child with RUTF in Sham ki Bhattian, Lahore District, Punjab province, Pakistan



WFP/Paida Taifq

## PAKISTAN

**What we know:** Both wasting and stunting remain highly prevalent in Pakistan despite national targets to meet the Sustainable Development Goals. There is growing evidence and recognition that wasting and stunting are interlinked.

**What this article adds:** Stunting reduction has been prioritised in Pakistan. Coverage of wasting treatment services in Pakistan is low (below 5%) which likely contributes to resistant stunting levels. Efforts are underway to integrate wasting treatment within primary healthcare services to catalyse scale-up. The Multi-Sectoral Nutrition Strategy 2018-2025 guides sector-specific action at federal and provincial levels (health, social protection, water, sanitation and hygiene (WASH), education, agriculture and livelihoods). Provincial interventions to address stunting and wasting are often siloed with variable coverage but have good potential to more closely align. There is strong political commitment and growing action to integrate wasting prevention and treatment with stunting reduction strategies in Pakistan. At federal level, a new five-year initiative to 2025 has been launched to tackle stunting with an integrated wasting management component targeting 35% of Pakistan's poorest population. To accelerate progress, a comprehensive national and provincial level nutrition review is being planned to inform a national nutrition policy and programming approach to guide a more holistic, harmonised response across the life cycle and all forms of malnutrition.

### Context

The high prevalence of all forms of malnutrition among vulnerable groups is a major concern in Pakistan. Undernutrition (both stunting and wasting), overweight/obesity and micronutrient deficiencies, either in isolation or in combination, have a marked effect on young children and women of reproductive age across the country. Globally, Pakistan is home to the highest number of stunted children after India and Nigeria. Over 40% of Pakistan's children under five years of age are stunted (12 million children) and 17.7% are wasted with 2.5 million children under five years of age estimated to be severely wasted (Government of Pakistan (GoP), 2018). Pakistan is one of the first countries in the world to nationally adopt the global Sustainable Development Goals (SDGs) to achieve a 40% reduction in stunting in children under five years of

age and to reduce and maintain childhood wasting below 5%. However, progress is slow and Pakistan is far from achieving these targets – since 2001 there has been a marginal decline in the prevalence of stunting (an average annual reduction rate of around 0.4%) and an increase in the prevalence of wasting (17.7% in 2018) compared to 1990 levels (12.5%) (GoP, 2018).

### The links between wasting and stunting

Evidence of wasting as a direct cause of stunting and the relationship between both manifestations of undernutrition is currently being explored globally (Wasting-Stunting Technical Interest Group (WaSt TIG), 2018). Growing evidence suggests that wasting is a direct cause of stunting, with studies showing that periods of wasting during childhood increase the risk of later stunting

(Richard et al, 2012; Schoenbuchner et al, 2018). There is also evidence that growth in height slows down in wasted children until their weight gain recovers (Briend et al, 2014). The risk of death for children concurrently wasted and stunted is high comparable to that of severely wasted children (WaSt TIG, 2018), making this a problem of particular concern.

An estimated 5.9% of children under five years of age in Pakistan are concurrently wasted and stunted (Government of Pakistan (GoP), 2018) with the prevalence of concurrent wasting and stunting highest in rural areas (6.8%), among children of mothers without any education (7.7%) and households within the poorest wealth quintiles (10.7%). Concurrent wasting and stunting is also slightly more prevalent among boys (6.5%) compared to girls (5.4%). In terms of geographical spread, the highest prevalence of concurrent stunting and wasting is in Sindh province (10.0%) followed by Balochistan (6.5%), Punjab (4.3%) and Khyber Pakhtunkhwa (3.7%).

Different analyses reveal several common predictors of wasting and stunting in Pakistan, including poor maternal nutrition (underweight or low stature) and poor water or sanitation (Kim et al., 2017; Harding, Aguayo and Webb, 2018). The age distribution of wasting and stunting differs but there are common drivers and both conditions may already be present at birth and persist concurrently in the first year of life. The high prevalence of concurrent stunting and wasting among the districts with high rates of maternal underweight (body mass index (BMI) <18.5 kg/m<sup>2</sup>) suggests that maternal factors play a major role in early infant growth failure and that integrated strategies for prevention and management should target pregnancy and early infancy (GoP, 2018).

Pakistan has very high levels of undernutrition among women of reproductive age. According to the National Nutrition Survey 2018, 42.7% of women are anaemic and uptake of iron and folic acid (IFA) supplementation is low (GoP, 2018).<sup>1</sup> Furthermore, 14.4% of women are underweight and overweight and obesity have increased from 28% in 2011 to 38% in 2018. In Pakistan, infant and young child feeding practices are also suboptimal. Less than half of mothers (45%) practice early initiation of breastfeeding and only around half (48%) of infants aged less than six months are exclusively breastfed. Only one in every three infants age 6-8 months is fed complementary food and only 3.6% of children 6-23 months receive complementary foods that meet the requirements of a minimum acceptable diet (GoP, 2018).

These data point to a continuum of undernutrition throughout the lifecycle in Pakistan with a close association between undernutrition in women and their offspring. This is reflected in the high prevalence of low birth weight (LBW) in the country at 20%, whereby in-utero origins of undernutrition result in many infants being born wasted and stunted which is then exacerbated by poor infant and feeding practices after birth. Notably in Pakistan, more than half of all

childhood stunting and wasting is apparent by six months of age and the bulk established by 24-36 months of age (GoP, 2018).

### Low coverage of wasting treatment in Pakistan as a driver of stunting

Despite provincial community-based management of acute malnutrition (CMAM) programmes to manage severe wasting in Pakistan, the coverage of treatment services remains below 5%. This is largely due to CMAM programming being, until recently, emergency-driven with short term and unpredictable funding and a lack of integration of wasting treatment services into the routine health system, particularly in development settings. Efforts are now underway to address this by implementing wasting treatment services through an existing cadre of government health workers (Lady Health Workers (LHWs)). This is explored fully in another article in this issue of *Field Exchange*.<sup>2</sup>

Another contributing factor to the low investment in wasting management in Pakistan has been the global drive to scale up multi-sectoral nutrition programming to reduce levels of stunting through the Scaling up Nutrition (SUN) movement. While this has helped put stunting reduction high on the national political agenda in Pakistan, it has also somewhat 'divided' interests, contributing to a separation in national policy-making and programming for stunting and wasting and with stunting (nutrition-sensitive programming) and wasting (nutrition-specific programming) falling under separate government entities.<sup>3</sup> This separation has been exacerbated by the historical impression that wasting is a short-term problem that is quickly reversible with the right treatment when, in reality, many children in Pakistan face repeated or persistent episodes of wasting in their early years which contribute to an increased risk of stunting and death. Given the close link between wasting and stunting in Pakistan, this failure to provide treatment to the majority of wasted children most likely contributes to the high prevalence of stunting in the country.

It is increasingly understood that wasting treatment and prevention are essential components of efforts to promote the healthy growth and development of children in Pakistan. Both wasting and stunting should therefore be viewed through a single lens and wasting treatment and prevention included as a component of stunting prevention in all contexts where wasting exists – both humanitarian and development – to achieve stunting and mortality reduction.

### Strategies and programmes to address stunting in Pakistan

Pakistan has developed strategies for stunting reduction (as well as wasting management, maternal and adolescent nutrition) at both the federal and provincial levels under the overarching strategic framework of the Pakistan Multi-Sectoral Nutrition Strategy (PMNS) 2018-2025. This strategy was designed to double the current average annual reduction rate (AARR) in stunting

from 0.5% to 1% and therefore reduce the prevalence of stunting from 40% in 2018 to 33% by 2025. All provinces in Pakistan have developed, and are implementing to some extent, a multi-sectoral response in line with this strategy. The sectors involved usually include health, agriculture, fisheries and livestock, education, population welfare, water, sanitation and hygiene (WASH) and social protection. Specific actions by sector and plans within the provinces are described below.

**Health sector:** Selected nutrition interventions, including iron and folic acid (IFA) supplementation for pregnant women, child deworming, vitamin A supplementation, treatment of severe acute malnutrition (SAM), promotion of infant and young child feeding (IYCF) and multiple micronutrient powders (MNP) are currently delivered through the government health service delivery platform as a routine package of services for women and children. This is delivered through time-bound provincial nutrition projects (PC-1), delivered vertically through a specific cadre of staff in parallel with the primary healthcare system. Current work to integrate this system fully within the primary health care system (delivered through Lady Health Workers (LHWs)) is ongoing.<sup>4</sup> Full integration into public healthcare is essential to ensure national coverage of wasting treatment and prevention and in order to have a meaningful impact on levels of stunting.

**Social protection:** The Benazir Income Support Program (BISP) under EHSAAS is the biggest federal nutrition-sensitive social protection scheme in Pakistan, launched in 2008, targeting 5.7 million of the poorest and most vulnerable of Pakistan's population. The BISP is a nationwide conditional cash transfer programme that aims to improve the health and nutrition situation in Pakistan through the reduction of stunting. Families receiving cash grants are encouraged to improve their dietary intake through nutrition counselling (although the nutrition counselling component is so far quite weak). Early efforts are underway to link this service with the public healthcare system and service delivery platform, delivered through LHWs. Recently, a health and nutrition conditional cash transfer programme, Ehsas Nashonuma, was launched to address stunting in children under 23 months of age in high burden districts, implemented through health facilities. This is funded by the Government of Pakistan (GoP) with implementation through the World Food Programme (WFP).

**WASH sector:** Federal and almost all provincial multi-sectoral stunting alleviation strategies in-

<sup>1</sup> Around 32.9% women received IFA during pregnancy. Of those who received IFA, 67.2% did not take them, 22% continued IFA until 90 days or more, 5.8% continued for less than 60 days and 5% for 60-89 days.

<sup>2</sup> See article entitled, "Integration of essential nutrition interventions into primary healthcare in Pakistan to prevent and treat wasting: A story of change"

<sup>3</sup> Nutrition-specific programming is under the Ministry of Health Services, Regulation and Coordination (MoNHSR&C)

<sup>4</sup> See article in this edition entitled, "Integration of essential nutrition interventions into primary healthcare in Pakistan to prevent and treat wasting: A story of change"



**Figure 1** General nutrition rules and markers - Government of Khyber Pakhatunkhwa, Pakistan

# GENERAL RULES/MARKERS



- 

Does the **project targets vulnerable group/s** - The interventions must be designed in way that the benefit reaches the most vulnerable groups such as (Adolescent girls, PLWs, children under the age of 6-24 months and 6-59 months)

**1**
- 

Does the project have **conditional vouchers? Does the condition have any link with food preferably fortified food or any other nutrition activity?** E.g. attending nutrition session by the mothers of school children or sending their girl child to school?

**8**
- 

Does the project has any **nutrition objective** - There should be an objective linked with addressing and reducing malnutrition. For example, "reduction in maternal Iron deficiency anaemia"

**2**
- 

Does the project **invest in women** to safeguard and strengthen the capacity of women to provide for the food security, health, and nutrition of their families?

**9**
- 

Do **social protection schemes ensure gender sensitive distribution?** The evidence suggests that women spend more on food having better impact on nutrition.

**3**
- 

Does the project have **nutrition sensitive interventions?** (e.g. homestead animal rearing, promotion of fruits and vegetables or drying of fruits and vegetables to minimize the seasonal effect and increase food diversity)

**10**
- 

Does the project has any **link with the prevalence rate of malnutrition?** For example, some districts have high rates of malnutrition and food insecurity.

**4**
- 

Does the project increase **access to year-round availability of high-nutrient foods?**

**11**
- 

Does the project has **nutrition sensitive interventions and ensures gender sensitive distribution?** The evidence suggests that women spend more on food resulting better impact on nutrition.

**5**
- 

Does the project have any **nutrition target**- The project/activities must have some nutrition targets to achieve?

**12**
- 

Does the project has **food based social protection schemes? And is it fortified food?** (e.g. Iron fortified flour & edible oil with additional vitamins).

**6**
- 

Does the project **improve nutrition knowledge** among rural households to enhance dietary diversity?

**13**



clude water, sanitation and hygiene (WASH) interventions and mainly focus on hygiene promotion, access to and use of safe water and the promotion of Open Defecation Free (ODF) villages using the Community-Led Total Sanitation (CLTS) approach. In provinces such as Sindh and Punjab, provincial WASH sector plans also include objectives such as a reduction in diarrhoea prevalence and improvement of safe hygienic feeding practices. However, the scale of implementation of these programmes is currently limited to specific geographic areas.

**Agriculture and livelihoods to boost food access:** Nutrition-sensitive interventions such as the promotion of kitchen gardening, fruit tree plan-

tation, agriculture, fisheries and livestock are included in the multi-sectoral nutrition strategy and reflected in sectoral plans. The role of livelihood and food-based approaches needs strengthening and synergies identified and established to enable and sustain complementarity.

**Education sector:** The education sector is collaborating with the health sector to target adolescent girls and school-aged children with nutrition interventions. According to the National Guidelines on Adolescent Nutrition and Supplementation and National Adolescent Nutrition Strategy, all adolescent girls should receive weekly iron folic acid (WIFA) tablets. This strategy is included in national and some provin-

cial nutrition programming and a pilot programme is currently being implemented in one district to assess its effectiveness, challenges and bottlenecks.

To ensure that different sectors include stunting reduction into their planning process, the Scaling up Nutrition (SUN) Secretariat of Khyber Pakhtunkhwa (KP) province has developed general nutrition markers (Figure 1) and sector-specific nutrition markers (Figure 2) for the Government of KP to use when assessing projects submitted for consideration for funding. This is so far being used in KP but there are plans to expand the use of the nutrition markers to other provinces.

**Figure 2** Sector-specific nutrition markers – Government of Khyber Pakhtatunkhwa, Pakistan

**FOLLOWING ARE SECTORS SPECIFIC NUTRITION MARKERS:**

**01 AGRICULTURE & FOOD SECTOR**

- 👉 Is there any provision of storing, pickling, curing, drying of vegetable/fruits etc. linked to decrease seasonal effect or food diversity in PC-I/project?
- 👉 Is there any component of training/skill improvement/modern method of farming to boost and diversify foods for community members in PC-I/project?
- 👉 Is there any fortified food components/items included in the PC-I/project?
- 👉 Is there any special focus to the areas which are food insecure and malnutrition is high in PC-I/project?

**02 EDUCATION SECTOR**

- 👉 Is there provision of safe drinking water for the school children with the objective to link it with health and nutrition?
- 👉 Any WASH facility available in the proposed project with the objective to link it to nutritional outcome.
- 👉 Is there any provision in the PC-I to include nutrition relate chapter/chapter in school curricula?
- 👉 Is there any provision for school meal/milk/fortified food and vitamins supplement program for malnourished children especially middle/high schoolgirls (adolescents)?
- 👉 Is there any school deworming program linked to improve nutrition status of school children?

**03 LOCAL GOVERNMENT & RURAL DEVELOPMENT/ PUBLIC HEALTH ENGINEERING DEPARTMENT**

- 👉 Any water testing labs proposed in the PC-I/project?
- 👉 Any sanitation component proposed in the PC-I/project?
- 👉 Does this PC-I/project promote nutrition friendly social mobilization in society at Union Council/Village Council, level with focus on health hygiene and importance of the locally available foods?

**04 SOCIAL SECTOR**

- 👉 Is there any component of nutrition related items e.g. health, hygiene & nutrition education included in the PC-I/project for adolescent girls in the proposed project for the social welfare centres?
- 👉 Is there any component of social safety nets (e.g. cash transfer, subsidies on fortified foods etc.) in the PC-I/project for marginalized people such as pregnant and lactating women, adolescent girls and other malnutrition population?





## Opportunities to link stunting and wasting reduction initiatives

Although provincial multi-sectoral strategies and plans exist to address the management of both wasting and stunting, the post-devolution scenario has resulted in the fragmentation of strategies across various programmes, projects and geographic areas. An integrated full package of interventions to address wasting and stunting simultaneously in all contexts does not yet exist. Owing to the clear demonstration of the concurrence of wasting and stunting in the National Nutrition Survey 2018, there is now understanding among national decision-makers and programmers that it is high time to rectify this issue and proactively identify opportunities to optimise efforts to treat and prevent wasting as part of ongoing stunting programming. Opportunities to integrate stunting and wasting programming exist at provincial level and some progress is being made, as described in Box 1.

At federal level, a provincial nutrition project (PC1) was initiated in 2020 for the next five years entitled, "Tackling Malnutrition Induced Stunting in Pakistan". This started as a stunting prevention initiative but, as a result of ongoing

discussions with the provinces and considering the high prevalence of wasting in the country, a strong wasting management programme has been integrated within it. This PC1 will reach around 35% of Pakistan's population, targeting the most poor, underprivileged and hardest to reach populations in Pakistan, at a cost of around USD2 billion over five years.

In order to accelerate the progress made to date, a comprehensive national and provincial level nutrition review is being planned. The intention is for this to inform the development of a consensus-based national nutrition policy and standardised nutrition programming approach to guide a more holistic, harmonised response that encompasses all major determinants and manifestations of malnutrition. This will be steered by the Ministry of National Health Services, Regulation and Coordination (MoNHSR&C) and the Ministry of Planning, Development & Reform (MPD&R) with technical support from UNICEF. Key to success will be a clear approach to improve the nutritional status of pregnant women and adolescent girls, the effective coordination and engagement of stakeholders, central oversight and effective monitoring. An ideal platform to provide this is the Pakistan National Nutrition Coordination

Council (PNNCC) of the Prime Minister's Secretariat. Currently, the Provincial Directorate Health General from each province and MoNHSR&C report progress on nutrition programming to the PNNCC which makes this a natural coordination platform. The Ministry of Finance and Planning Commission must be engaged to ensure adequate financing of nutrition initiatives at federal and provincial/regional levels.

## Conclusions

Pakistan is confronted with a triple burden of wasting, stunting and childhood overweight and obesity. The country must move away from the vertical programming that addresses each manifestation of malnutrition separately towards the management of all children who are not growing well. Decision-makers must consider the full range of compromised growth and develop programmes that address both wasting and stunting at scale, also expanding this to encompass the reduction of childhood overweight and obesity. A national nutrition policy, informed by data from the National Nutrition Survey, is yet to exist in Pakistan but is crucial to accelerate progress. Another important strand is the integration of wasting management within the Primary Health Care (PHC) system to rapidly scale up and increase the coverage of wasting treatment services country-wide. Such efforts must be linked with multi-sectoral stunting reduction strategies to optimise efforts to address the multi-faceted causes of both manifestations of undernutrition within the country.

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### Box 1 Current initiatives and opportunities to integrate wasting and stunting programming at provincial level

In **Punjab**, a provincial nutrition project (PC1) is in place covering nutrition-specific interventions including the management of severe acute malnutrition (SAM), infant and young child feeding interventions and the delivery of multiple micronutrient supplements (MMS) to children and pregnant and lactating women. This is delivered through the Integrated Reproductive, Maternal, Newborn & Child Health and Nutrition (IRMNCH&N) Programme, the largest programme delivering nutrition services in all districts in the province. Separate to this, the Chief Minister's Stunting Reduction Programme (encompassing a similar set of nutrition-specific interventions and nutrition-sensitive interventions spanning WASH, education, social protection and food security) is implemented in the seven districts of Southern Punjab with the highest levels of stunting in the province. Very little coordination and linkage can currently be observed between these two flagship programmes in the province.

In **Khyber Pakhtunkhwa**, the integration of health services delivery is being rolled out across 25 districts through an existing PC1. This integrates maternal nutrition and child health services, the Lady Health Workers (LHW) programme, wasting treatment and the expanded programme of immunisations. However, coverage is only around 20% owing to the lack of human and financial resources to enable scale. Recently, a multi-sectoral nutrition programme was implemented in Khyber Pakhtunkhwa, named KP SPRING. The objective of this programme is to reduce stunting in the southern part of the province with a target coverage of around 50%. The programme includes a range of nutrition-specific interventions (infant and young children feeding (IYCF) counselling, MMS and zinc for children, iron and folic acid (IFA) for pregnant women and nutrition counselling) and nutrition-sensitive interventions involving the following government departments: agriculture, livestock and fisheries, population welfare, education, public health engineering, local

government and rural development and social welfare. This programme has a weak integration with the ongoing wasting treatment programme (integrated into health service delivery) given the narrow cross-over in terms of geographic location.

In **Sindh**, a ten-year multi-sectoral Accelerated Action Plan (AAP) for Reduction of Stunting and Malnutrition comprises both nutrition-specific and nutrition-sensitive interventions and is being implemented through eight sectors. In districts where the AAP is being implemented, approximately 58% of health facilities operate an Outpatient Therapeutic Programme (OTP) for the treatment of severely wasted children. Coverage of the World Food Programme implemented Targeted Supplementary Feeding Programme (TSFP) services for the treatment of moderately wasted children and pregnant and lactating women in the province is estimated to be only 3.6%.

In **Balochistan**, emergency and drought nutrition responses exist in 13 districts with almost 13% of health facilities providing services to treat SAM and to promote and support IYCF. Since December 2019 there has been no active PC1 for nutrition and therefore almost no government-funded nutrition programming in the district. Partner-driven stunting reduction programme initiatives exist in a few geographical locations. Funds for both wasting and stunting reduction programmes are external and emergency driven.

**Gilgit Baltistan** has recently approved a community-based nutrition PC-1 for all districts encompassing mostly preventive nutrition interventions.

In addition to the PC-1 programmes in each province, there are donor funded nutrition programmes currently operating in Sindh, KP and Balochistan with varied coverage.

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Child in Chapagaun village, Lalitpur, Nepal, 2015



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## Experiences of the Integrated Management of Acute Malnutrition (IMAM) programme in Nepal: from pilot to scale up

By Karan Courtney Haag, Anirudra Sharma, Kedar Parajuli, and Anju Adhikari



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## NEPAL

**What we know:** Despite falls in the prevalence of stunting in children, wasting remains a persistent problem in Nepal, a country prone to emergencies.

**What this article adds:** A combination of a persistently high wasting prevalence, advocacy efforts by United Nations (UN) agencies and development partners and the need to respond to severe and recurrent humanitarian crises catalysed an initial pilot Community-based Management of Acute Malnutrition (CMAM) programme in Nepal in 2009 to test delivery models within existing health services. Ten years later, a sustainable scale up of the integrated management of acute malnutrition (IMAM) has been achieved through a government owned and managed approach enabled by a strong policy framework (embedded within the Multi-sectoral Nutrition Plan), national and devolved governance architecture, commitment and dedicated financing and services integrated within a well-developed community health system. The Ministry of Health and Population (MoHP) now funds 90% of the IMAM programme. Technical and financial assistance from United Nations agencies, bilateral donors and non-governmental organisations (NGOs) have enabled the evolution of the IMAM programme. Owing to its success, IMAM was scaled up to cover 38 of 77 districts across the country with capacitated and skilled government health workers delivering care. Surge capacity to emergencies is embedded as part of emergency preparedness. Ongoing challenges being addressed include the supply chain management of ready to use therapeutic food (RUTF), case identification, treatment coverage (low at 15%) and the management of moderate wasting.

### Context

Improving the nutritional status of children under five years of age is a major challenge in Nepal. The prevalence of stunting in children has steadily decreased over the past 16 years from 57% in 2001 (Nepal Demographic Health Survey (NDHS) 2001) to 32% in 2019 (Multiple Indicator Cluster Surveys (MICS) 2019). However, the prevalence of wasting has remained almost the same, currently standing at around 12% nationally (Figure 1). An estimated 3% of children under five years of age are severely wasted, equivalent to 54,000 children (MICS, 2019). The high national prevalence of wasting masks geographic, ethnic, socio-economic and age disparities across Nepal's seven provinces that are reflected in varying wasting levels, from 17.6% in Karnali Province in the far west to 4.7% in Bagmati Province in central Nepal.

Nepal's malnutrition crisis is the result of multiple causes and factors including household socio-economic status, sub-optimal breastfeeding practices, recurrent childhood illnesses, poor complementary feeding practices and underlying poor sanitation and environmental conditions. These issues are exacerbated by the impact of severe and recurrent humanitarian

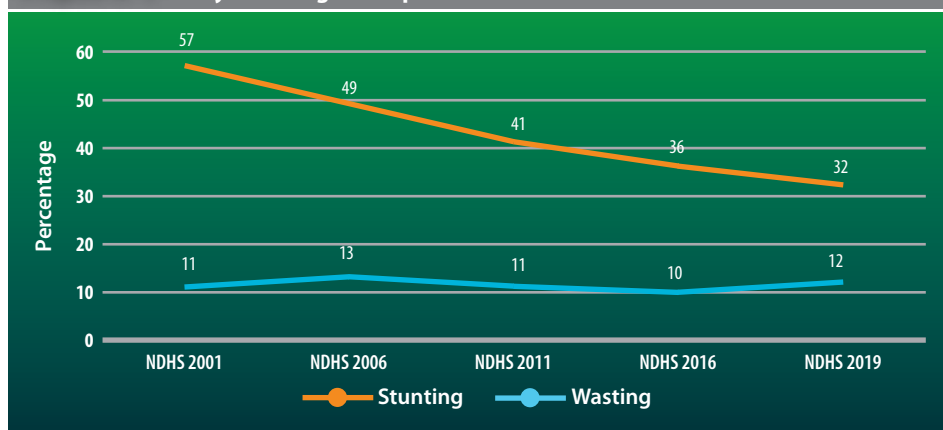
crises in the country including annual floods in the southern provinces and districts of Nepal and topographic challenges in other parts of the country that lead, for example, to lack of access to essential services in hilly and mountainous areas.

Prior to the introduction of community-based management of acute malnutrition (CMAM) in Nepal, the treatment of acute malnutrition was carried out mainly in Nutrition Rehabilitation Homes (NRHs) established since 1998 by the Nepal Youth Opportunity Foundation (NYOF),<sup>1</sup> an international non-governmental organisation (INGO), managed by the Ministry of Health and Population (MoPH) and staffed by government health workers. Assistance to families of wasted children focused mainly on caregiver counselling on hygiene, feeding practices and balanced diet and treatment with therapeutic milk (prepared according to the World Health Organization (WHO) recipe) and nutrient-dense food. Severely wasted children were treated as inpatients at NRHs where they and their caretaker were expected to stay for a minimum of four weeks. This posed difficulties for caretakers in terms of care for other chil-

<sup>1</sup> <https://www.nepalyouthfoundation.org>



**Figure 1** Trends in the prevalence of wasting and stunting among children under five years of age in Nepal



dren and work responsibilities, leading to a high default rate. In addition, the NRHs could not address severe wasting on a large scale due to their limited number (14) and the low capacity of each NRH nutrition unit (10 to 20 beds).

In March 2007, the WHO, the World Food Programme (WFP), the Standing Committee on Nutrition (SCN) and United Nations Children's Fund (UNICEF) released a joint global statement in support of CMAM which recognised that large numbers of severely wasted children could be treated in their communities without being admitted to a health facility or a therapeutic feeding centre. This gave impetus to the Government of Nepal to implement CMAM programming, the evolution of which is described in this article.

### Building the evidence for CMAM in Nepal – pilot study and evaluation 2009-2012

UNICEF and the Ministry of Health and Population (MoHP) in Nepal carried out a study in 2008 to assess the feasibility of implementing CMAM (known as Community Therapeutic Care at that time). The study confirmed that there was sufficient capacity in Nepal to pilot a CMAM programme within the existing health system through government hospitals, health post staff and female community health volunteers (FCHVs) in collaboration with the national and district health authorities. The pilot programme was subsequently approved for implementation by the Government of Nepal in 2008 and included in the National Emergency Nutrition Policy.

The purpose of the pilot was to evaluate the integration of CMAM programming within the existing government health system in the three different agro-ecological zones of the country (terai in the south and the hill and mountainous regions). Five pilot districts were selected across the three zones due to their high prevalence of wasting (>10%), widespread poverty, hospital infrastructure and existing capacity for Community Based Integrated Management of Childhood Illness (CBIMCI). A baseline nutrition survey was undertaken in all five pilot districts

by Action Contre la Faim (ACF) and Concern Worldwide.<sup>2</sup> Three different operational models to treat severe wasting were then tested in the five pilot districts. In model one, Concern Worldwide, an international non-governmental organisation (INGO), provided technical and financial assistance to government health personnel to implement the CMAM programme in one district. In model two, UNICEF provided direct financial support and technical assistance to the central government who, in turn, allocated funds to two districts for implementation of the CMAM activities. In model three, a local non-governmental organisation (NGO) supported the capacity development of district and provincial health officers with remote technical support from UNICEF and the Ministry of Health and Population (MoHP). The pilot was funded by the government, the UK Department for International Development (DFID), UNICEF, the European Union (EU) and the Central Emergency Response Fund.

By the end of the pilot, 75 outpatient therapeutic centres (OTCs) had been established in the five pilot districts. Most of the OTCs were located in a room or building in a primary health centre (PHC), hospital or health post (HP) and, in a few cases, OTCs were implemented in a sub-health post (SHP). OTCs were staffed by existing government health workers who were trained on the CMAM protocol. These were typically nurses who were seconded from their normal work posts and services and who provided services free of charge to the programme. Ready to use therapeutic food (RUTF) was used to treat severely wasted children without complications, sourced by development partners and managed by the MoHP outside of the health supply chain system.

In 2011, UNICEF supported the MoHP to conduct an evaluation to assess the performance of the CMAM pilots (UNICEF, 2012). The evaluation demonstrated good performance with respect to Sphere indicators in all five pilots. As of June 2011, out of 5,609 discharged children, 86% recovered, 0.2% died and 9% defaulted (Table 1). The average length of stay was 49 days and the average weight gain was 4.8g/kg/day. Treatment coverage was not calculated. The evaluation found that model two, direct support from UNICEF to the government, was the most cost-efficient modality and the model that fostered strongest government ownership of the programme. The lessons and recommendations from the pilot evaluation were used by national stakeholders, United Nations agencies, donors and NGOs to advocate for the allocation of resources for the scale up of CMAM in areas of Nepal with high wasting burdens.

### Integration of CMAM into Primary Health Care Services

#### Policy framework

The success of the pilot was the trigger for the introduction of Nepal's CMAM programme across six out of seven provinces across the country, selected on the basis of their nutritional vulnerability. At this point, the programme was transformed into the Integrated Management of Acute Malnutrition (IMAM) – a term that encompasses the intention to further integrate facility and community-based approaches as well as prevention and treatment services. In 2013, national IMAM guidelines were developed by the Ministry of Health and Population (MoHP) and the IMAM programme was included in the country's first Multi-sectoral Nutrition Plan (MSNP-I, 2013-2017). This was a significant step forward, reflective of the government's increasing commitment to the programme and the nutrition agenda and recognition of the need to embed CMAM programming within wider treatment and prevention services. In 2018, the second edition of the MSNP (MSNP-II, 2018-2022) was finalised and approved which also prioritised IMAM for the health sector. The MoHP is the overall lead ministry for nutrition specific interventions within the MSNP, including CMAM programming, and is accountable to the High-Level Nutrition and Food Security Steering Committee which sits within the National Planning Commission. The National Health Policy, National Health Sector Strategy and IMAM guidelines are other important policy and technical documents that drive the IMAM programme in Nepal.

**Table 1** Total severe acute malnutrition (SAM) treatment in Nepal (2009-2018)

Facilities	Admission	Discharged	Recovered*	Deaths*	Defaulter*	Other discharged*
Outpatient (OTC)	82,923	66,439 (80.1%)	55,274 (83.2%)	176 (2.6%)	7,214 (10.9%)	3,755 (5.7%)
Inpatient (NRH)	17,076	17,076 (100%)	16,588 (97.1%)	7 (0.04%)	0	481 (2.8%)
<b>Total</b>	<b>99,999</b>	<b>83,515</b>	<b>71,862</b>	<b>183</b>	<b>7,214</b>	<b>4,236</b>
<b>%</b>		<b>83.5</b>	<b>86.0</b>	<b>0.2</b>	<b>8.6</b>	<b>5.1</b>

\* % of discharged

<sup>2</sup> Nutrition Anthropometric Survey, Mugu, Achham, Kanchanpur ACF, 2008; Nutrition Survey Report, Jajarkot, Sustainable Development Initiative report to Concern, 2008.

### Accountability and funding

At provincial level, the Ministry of Social Development (MoSD) is responsible for implementing nutrition specific interventions developed by the MoHP and health facilities are responsible for implementation at municipal level. However, since the federalisation of Nepal, all three tiers of government (federal, provincial and local) are independent, therefore the MoSD is not accountable to, nor does it report to, the MoHP for this implementation.

The IMAM programme was initially funded by development partners, including UNICEF. However, the MoHP now funds 90% of the programme and the UK's Department for International Development (DFID) and the World Bank support the remaining 10%. Government funds include the procurement and management of therapeutic food and milks within the health system's supply chain, staffing, training of the government health workforce and information management. UNICEF, the United States Agency for International Development (USAID) and Action Contre la Faim (ACF) provide ad hoc support for capacity development activities on request from the MoPH and UNICEF has supported ready to use therapeutic food (RUTF) procurement when the government process has been delayed or constrained. A five-year costed action plan for nutrition is currently being developed by the MoHP which will inform the exact costs of the IMAM programme.

### CMAM implementation modality

IMAM is delivered through the government health system as a part of a comprehensive set of nutrition interventions, integrated within the basic package of health services. At municipal level, IMAM is delivered at government health facilities through a separate room or desk alongside other child health and nutrition programmes, all of which serve as platforms for identifying children with moderate or severe wasting. Children attending a health facility for growth monitoring and infant and young child nutrition counselling or for the integrated management of childhood illnesses (IMCI) are screened using weight for height and, if severe wasting is indicated, are referred for treatment in either an outpatient therapeutic centre (OTC) or a Nu-

trition Rehabilitation Home (NRH) depending on whether complications are present. When a child is identified as moderately wasted, their caregiver is given nutrition counselling.

Female community health volunteers (FCHVs) also screen children using mid-upper arm circumference (MUAC) during the biannual vitamin A campaigns, distribution of micronutrient powders and during village-level mothers' groups and nutrition education activities. When children are referred to a health facility for nutrition assessment and subsequent treatment, those who are not yet included in the government's universal child cash grant are identified and referred for registration.

### Performance indicators

Since 2012, the IMAM programme has expanded and is now implemented in 38 out of 77<sup>3</sup> districts through 500 OTCs located in health posts and 21 NRHs located within hospitals. Figure 2 shows the increase in admissions of severely wasted children to OTCs between 2009 and 2018 as the programme expanded into new districts and the number of OTCs increased. The increase in admissions was also due, to some degree, to increased social mobilisation efforts and media campaigns promoting the services as well as the increased capacity of health workers to identify and treat severely wasted children. The drop in admissions in 2015 shown in Figure 2 is likely due to the immediate disruption in services caused by the earthquake that occurred resulting in the loss of healthcare infrastructure and reduced capacity for service provision. OTC indicators between 2009 and 2018 show high performance including an average recovery rate of 83%, a low death rate of 0.26% and a defaulter rate of 10.9%, well within Sphere standards.

### Barriers and bottlenecks

The continued high prevalence of wasting indicates that there is a need to give greater priority to actions to prevent children from becoming wasted. Currently there is more emphasis on the treatment of wasting and very little is understood about actions to prevent it within the Nepal context.

Despite the successful scale-up of the IMAM programme in Nepal, there are barriers to

coverage and quality of services that still need to be addressed. Active case finding through the health system is weak with screening linked to two mass vitamin A campaign events per year, the reach of which is limited and constrained by topography and access issues. Outside of the vitamin A campaigns, FCHVs are not systematically or routinely screening children for wasting, for example at the time of admission for other child related issues. This is a missed opportunity for the detection and referral of children in need of treatment. On the demand side, caregiver recognition of wasting is very low. Parents and caregivers often do not recognise the signs of wasting among their children, nor do they know about the associated increased risk of morbidity or mortality. Weak case finding and low demand by caregivers results in poor early detection and referral and health seeking for treatment.

Another barrier to improved treatment is weaknesses in the government supply chain management system. Stock outs at health facility level of RUTF or therapeutic milks are too frequent and the loss of stock due to expiry is linked with low detection rates and treatment defaulting. The MoHP is set to address these bottlenecks by first revising the national guidelines to include 'family MUAC' or 'mother-led MUAC' to enable caregivers to screen their own children for wasting and hence trigger early detection and care seeking. Supply chain issues are systemic and will require increased financial and human resource investment by MoHP to resolve. Another barrier is the lack of treatment for children with moderate wasting. Currently, caregivers of children identified as moderately wasted are counselled on feeding, hand washing, sanitation and hygiene practices. The MoHP is currently considering a change to the national IMAM guidelines to include a treatment option that would also encompass moderately wasted children, either through the provision of supplementary food and/or a change to a simplified wasting management protocol. This would help to prevent children with moderate wasting slipping into severe wasting.

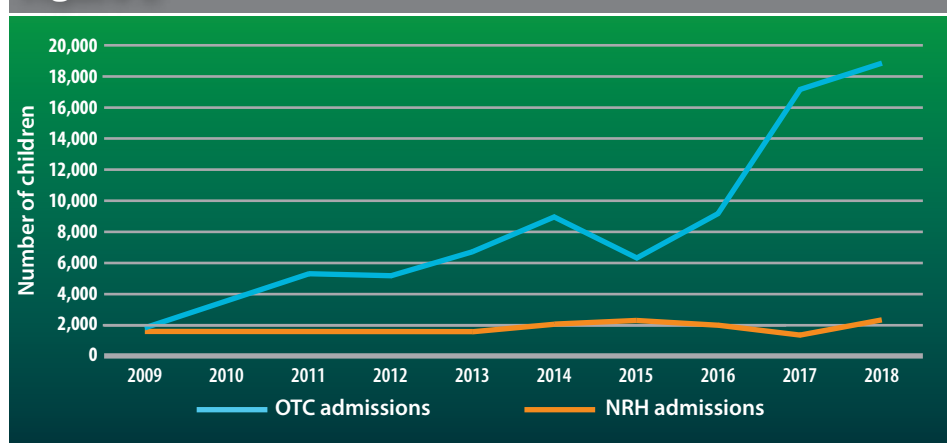
More recently, the MoHP with support from development partners, has adapted the national IMAM protocol in light of the restrictions imposed as a result of the COVID-19 pandemic. Adjustments include follow up visits having been extended from one week to two weeks and the MoHP is considering including family-MUAC in the revised version of the guidelines.

### Lessons learned implementing IMAM in Nepal

The following are some of the lessons learned and factors contributing to the success of the IMAM programme in Nepal and areas that require more attention:

**National policy framework:** The IMAM programme is included in national policy and plans, including in the first Multi-sectoral Nutrition Plan (MSNP-I, 2013-2017) and its successor,

**Figure 2** Admissions to OTCs and NRHs between 2009 and 2018



<sup>3</sup> The number of districts in Nepal increased from 75 to 77 in 2017 due to federalisation





A health worker uses a MUAC tape to screen a child for wasting, Nepal, 2015

MSNP-II, 2018-2022, as a high priority programme. Similarly, it is reflected in the national health policy and national health sector strategy and implementation is supported by national IMAM guidelines. The most recent National Nutrition Strategy and the Ministry of Health and Population (MoHP) five-year costed action plan also includes the IMAM programme. These policy documents form the foundation on which the programme is managed and implemented in Nepal.

**Well-established nutrition governance architecture and financing commitment:** After the formulation of MSNP-I in 2013, nutrition governance architecture was established at all levels of government. Nutrition and food security steering committees and coordination committees at federal, provincial and local government levels are responsible for planning, budgeting and ensuring funds are allocated for nutrition programmes. Without these, the IMAM programme would not have received the funding necessary for it to evolve.

**Well-established community health system:** In every ward of local government, there is at least one health facility consisting of five to eight health workers. In each community, there is one mothers' group led by a female community health volunteer (FCHV). These health workers, mothers' groups and FCHVs have the knowledge and skills to support community-based nutrition programmes including IMAM. The FCHVs screen children for wasting using mid-upper arm circumference (MUAC) and facilitate and strengthen the referral linkages between village and health facility.

**Commitment and ownership of different tiers of governments:** Local governments across Nepal have declared their commitment to eliminate all forms of maternal, adolescent and young child malnutrition through a multi-sectoral approach. Provincial and local governments have included nutrition programmes with budget allocation in their annual work plans and budgets so they can realise their respective commitments for universal coverage of essential nutrition services including the IMAM programme. While UNICEF continues to provide technical assistance, the Government of Nepal has since allocated domestic resources for the procurement of ready to use therapeutic food (RUTF), capacity de-

velopment of healthcare providers and a commitment to fulfill its scale up plan for sustainable continuity of the programme.

**Procurement and supply of RUTF:** For the last five years, the MoHP has gradually assumed responsibility for procuring RUTF and therapeutic milks using domestic resources, with development partners no longer providing this support. Despite this positive step to full government ownership, the allocated budget from government is not yet sufficient to meet 100% of the needs of severely wasted children in Nepal. There is an intention by MoHP to include RUTF in the Essential Medicine list in Nepal which may facilitate increases in allocated funds to meet the full need. Additionally, there are times when MoHP requests UNICEF to fill supply gaps that arise due to lengthy delays in the government's procurement processes. This requires further attention. Since local production is not financially feasible in Nepal, supplies are currently imported from India.

**Technical assistance to MoHP:** The technical and financial assistance provided by UNICEF, the European Union, DFID, ACF and Concern Worldwide to the MoHP over the past decade has helped to guide and steer the evolution of the IMAM programme and take a health system strengthening approach. Partners to the MoHP are still supporting in-service training of healthcare providers, capacity development of FCHVs, technical guidance for supply chain management, programme monitoring and reporting and periodic programme reviews and, most recently, the revision of the national IMAM guidelines.

**Coverage gaps:** Whilst there has been good progress in scaling up the IMAM programme to 38 out of 77 districts in Nepal and the establishment of outpatient therapeutic centres (OTCs) and Nutrition Rehabilitation Homes (NHRs) within the health system, the treatment coverage remains low at approximately 15%. More attention is needed to increase active case finding and the referral of severely wasted children so that more children who need it receive treatment.

**Capacity for surge support in emergencies:** Humanitarian crises have also played a critical role in the evolution of CMAM/IMAM programming in Nepal. There have been multiple humanitarian

crises that the government has responded to over the past decade, each of which has strengthened the resolve of the MoHP to scale up and fully integrate the IMAM programme into its overall nutrition programme. The capacity development of healthcare workers, FCHVs and civil society organisations that occurred during the pilot phase and capacity for surge support to respond to each humanitarian crisis (earthquake, drought and floods) has contributed to a pool of skilled providers. The implementation of the IMAM programme during these emergencies also provided evidence to the government of how well the IMAM programme worked to save lives in a humanitarian context.

Implementation of the IMAM programme has also contributed to the government's improved emergency preparedness and response capacity whilst the programme surge approach due to multiple crises has also helped to scale up IMAM from the initial five pilot districts to 59 between 2006 and 2018. Those districts supported during the earthquake emergency were subsequently phased out because of the declining need and, as of 2020, the IMAM programme is being implemented in 38 out of 77 districts.

## Conclusions

The IMAM programme in Nepal has been scaled up to improve coverage of wasting treatment using a government owned and managed approach, enabled by a strong policy framework, national and devolved governance architecture and financing commitment, with services integrated within the national health system. Owing to its success, IMAM is now delivered at scale in 38 districts across the country with capacitated and skilled government health workers delivering care. While continuing to develop existing services, the next critical step for the Ministry of Health and Population (MoHP) is to address how to manage children who are moderately wasted considering new ways such as simplified approaches to treatment and, equally important, to invest in understanding and implementing actions that prevent wasting.

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## One UN for nutrition in Afghanistan - Translating global policy into action: A policy shift to tackle wasting

By Maureen L. Gallagher, Martin Ahimbisibwe, Dr. Muhebullah Latifi, Dr. Zakia Maroof, Dr. Said Shamsul Islam Shams and Mursal Manati



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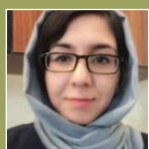
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WFP/Silke Buhr/Afghanistan

## AFGHANISTAN

**What we know:** Prevalence of child wasting remains high in Afghanistan; treatment services are underfunded, struggle to reach targets and are challenging to sustain.

**What this article adds:** Severe wasting treatment services in Afghanistan are delivered as part of the Basic Package for Health Services (BPHS) through government health facilities. While progress has been made to improve treatment coverage and programme performance, further scale-up has been impeded by reliance on short-term emergency funding and a narrow funding base, the insecure and expensive supply of imported ready-to-use therapeutic food (RUTF) and a high wasting burden. Prevention is central to the vision for wasting management in Afghanistan; opportunities exist to leverage existing programmes and to play to agency strengths. To realise this, the UN agencies in Afghanistan are committed to working together as per the 'One UN for Afghanistan' strategy. Led by the government under the Afghanistan Food Security and Nutrition Agenda (AFSeN-A) and consistent with the UN Global Action Plan (GAP) on Child Wasting framework for action, development of an operational roadmap for Afghanistan is now underway supported by United Nations Children's Fund (UNICEF), the World Food Programme (WFP), the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). By the end of 2020 it will provide detailed plans and a monitoring framework to guide a multi-sectoral package of interventions to harness the strengths and complementarity of each individual agency for greater impact. An analysis of convergence between the agencies and gaps is currently underway to inform this process. A longer-term funding strategy is integral to the outworking of this approach.

### Context

Undernutrition is highly prevalent among children under five years of age in Afghanistan and is an underlying cause of the country's high under-five mortality rate (55 per 1000 live births). Almost four out of every 10 children under five years of age in Afghanistan (37%) are stunted and one in ten children (9.5%) are wasted. Recent SMART surveys (2020) show that approximately two million children under five years in Afghanistan (1,020,000 girls and 980,000 boys) require treatment for wasting, 780,000 of whom (397,800 girls and 382,200 boys) are se-

verely wasted. Current Ministry of Public Health (MoPH) targets are to treat 600,000 wasted children; an estimated 30,000 cases are currently reached. Afghanistan also faces persistently high levels of micronutrient deficiencies including iron, iodine, zinc, vitamin A and vitamin D. Anaemia, mainly due to iron deficiency, affects 45% of children aged 6-59 months of age, 31% of adolescent girls and 40% of women of reproductive age. Adolescent girls who are stunted, thin or anaemic are more likely to experience poor pregnancy outcomes and give birth to babies who themselves are wasted and stunted.



A large proportion of Afghanistan's population is classified as vulnerable due to years of conflict and natural disaster-driven humanitarian crises, population displacement and disruption of essential services (Figures 1 and 2). The result is a population that is highly vulnerable to socio-economic hardship, seasonal surges in wasting, disease outbreaks (diarrhoea, acute respiratory infection and measles), poor hygiene and sanitation and poor access to food and health and nutrition services (especially in hard to reach areas). Sub-optimal feeding and care practices are also common,<sup>1</sup> influenced by gendered social and cultural beliefs and norms, food insecurity and poor household environments.

Despite growing demands for care, the health delivery system in Afghanistan is under-resourced and reliant on external aid to maintain service delivery. While significant attention has been given to addressing wasting as a humanitarian response, wasting treatment programme coverage remains low. Programmes to address the widespread problem of child stunting also remain low in priority and scale. These issues are further aggravated by erratic climate conditions, widespread food insecurity and the hard-to-reach nature of many communities. Most recently, the COVID-19 pandemic has led to rises in food prices, the closure of borders with neighbouring countries, reduction in mobility, loss of jobs and disruption of routine health services, leading to a fall in in-patient admissions of 50% in spite of prevalent COVID-19 in the population.<sup>2</sup>

This article examines current strategies to address the problem of wasting in Afghanistan and presents a vision for a future united effort to increase treatment coverage and address its underlying causes.

**Current interventions and intersectoral linkages**

*Integrated nutrition service delivery*

There has been commitment in recent years by the Ministry of Public Health (MoPH) and development partners to integrate nutritional services into government systems at national and sub-national levels. Nutrition-specific services in Afghanistan are delivered predominantly through non-governmental organisations (NGOs) contracted to deliver the Basic Package for Health Services (BPHS) and the Essential Package for

Health Services (EPHS) through government health facilities. These include growth monitoring, counselling on maternal, infant and young child nutrition (MIYCN) by midwives and nutrition counsellors, The Baby Friendly Hospital Initiative (BFHI), food fortification (salt, oil and wheat flour), weekly iron folic acid supplementation (WIFS) for adolescent girls (targeted to girls both in and out of school) and the integrated management of acute malnutrition (IMAM). Operational costs for these services, including NGO and health facility staffing, medicines and some supply transport costs, are covered by SEHATMANDI.<sup>3</sup> Costs of ready-to-use therapeutic food (RUTF) for the management of wasting are not covered and must be sourced externally.

Admission and performance data are collected monthly from health facilities and collated in a national database managed by the Public Nutrition Directorate (PND) of the MoPH. Plans to make this information available on an online dashboard are currently being finalised. Screening data is collected by the Health Management Information System (HMIS) to allow the monitoring of nutrition trends.

*Scale up of wasting treatment services*

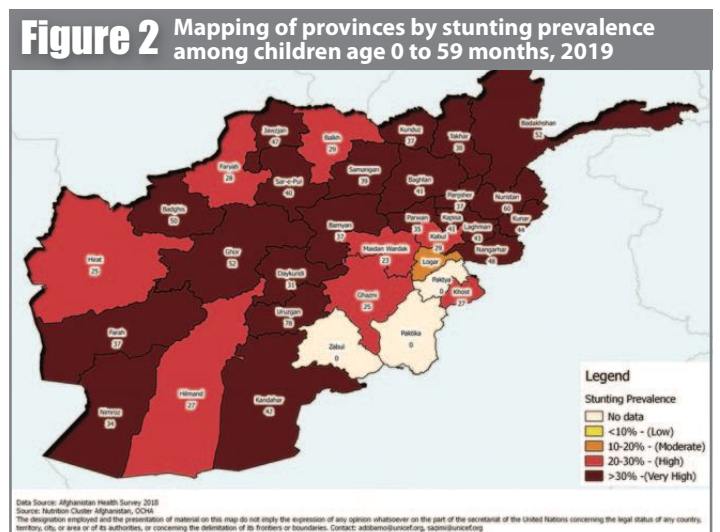
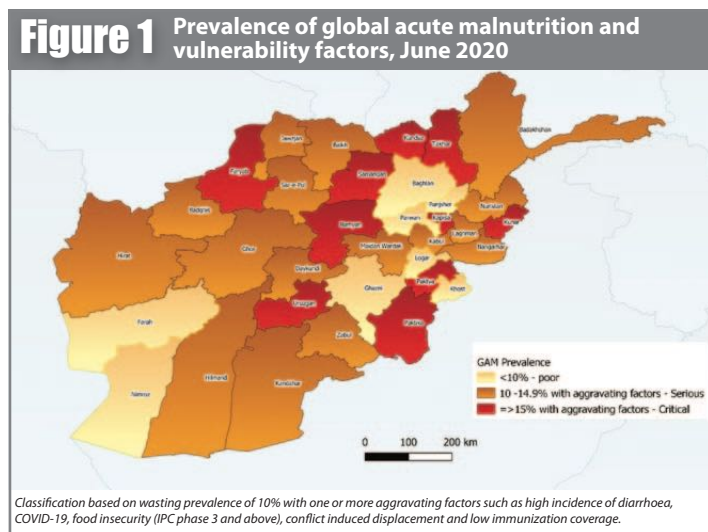
Scale up of treatment services has differed for moderate and severe wasting. For severe wasting, significant scale up took place between 2016 and 2018, resulting in the doubling of coverage of health facilities to almost 60% at a cost of around USD20 million per year. In 2019, plans for further scale up were interrupted by a foreseen shortfall of RUTF supplies for the year as well as an overall funding shortfall of around 30%. Moderate wasting programming is guided by the Humanitarian Response Plan (HRP), with locations prioritised by the Nutrition Cluster based on global acute malnutrition (GAM) rates and food security vulnerability (Integrated Phase Classification (IPC) phase 3 and above). As such, moderate wasting treatment is implemented in only around 45% of health facilities, at a cost of USD28 million per year, with less than 50% programme coverage.

Further geographical scale-up of severe and moderate wasting treatment is limited by resource availability – the scaling up of severe wasting treatment services alone to around 75% coverage will require an additional USD5 million per year

(to a total of USD25 million). Increased geographical coverage is also challenged by the hard to reach nature of many locations due to difficult terrain, weather and security. In some areas, this has been overcome through the use of mobile health and nutrition teams<sup>4</sup> operated by the Directorate of Provincial Health (DoPH) through BPHS and/or non-BPHS partners (often international NGOs). There is potential for expansion of this service delivery modality, particularly in the context of COVID-19, to minimise population movement. However, funding to scale up this activity remains limited.

As the cost of supplies is not covered under SEHATMANDI, RUTF for the treatment of severe and moderate wasting is dependent on off-budget and emergency short term funding. Procurement is led by the World Food Programme (WFP) and United Nations Children's Fund (UNICEF) with funding from various donors, such as Food for Peace/United States Assistance of International Development (USAID) and pooled funding through the Afghanistan Humanitarian Fund (AHF). WFP and UNICEF also provide technical support and ad hoc training to support wasting treatment and the World Health Organization (WHO) provides support for in-patient care, including the training of health staff on the management of severe acute malnutrition, the supply of therapeutic milk preparation kits, medical equipment and medicine and the rehabilitation of water and sanitation systems of in-patient units in hospitals.

<sup>1</sup> While 63% of Afghan mothers initiate breastfeeding early within one hour, the rate of exclusive breastfeeding of children aged 0-5 months remain low at 58%. Inadequate diets, lack of food diversity and poor micronutrient quality are major concerns; only 16% of children aged 6-23 months receive the minimum acceptable diet.  
<sup>2</sup> Results of a national survey to estimate COVID-19 morbidity and mortality in Afghanistan conducted in July 2020 show that people in Kabul and east region provinces were most affected by COVID-19 with 53% and 42.9% of people respectively testing positive (IgM and IgG testing).  
<sup>3</sup> SEHATMANDI is the System Enhancement for Health Action in Transition Project for Afghanistan with the objective to expand the scope, quality and coverage of health services provided to the population, particularly to the poor, in the project areas, and to enhance the stewardship functions of the Ministry of Public Health (MOPH).  
<sup>4</sup> Ahmad Nawid Qarizada, Maureen L. Gallagher, Abdul Qadir Baqakhil and Michele Goergen (2019). Integrating nutrition services into mobile health teams: Bringing comprehensive services to an underserved population in Afghanistan. *Field Exchange* 61, November 2019, p 62. [www.enonline.net/fex/61/mobilehealthteams](http://www.enonline.net/fex/61/mobilehealthteams)



### Strengths and challenges of nutrition-specific programming in Afghanistan

Much has been achieved in the strengthening and coordination of national nutrition-specific programming. Led by the government, multiple agencies including UNICEF, WFP and WHO consistently collaborate to bring a quality continuum of care closer to women and children (Box 1). Key collaborative initiatives have successfully increased admissions and the performance of wasting treatment programmes, including the training of health workers, last mile delivery of supply, counselling on MIYCN, community-based nutrition package (CBNP),<sup>5</sup> strengthening the engagement of community volunteers and Mothers'/Family mid-upper arm circumference (MUAC).<sup>6</sup> Other joint initiatives have been the development of MIYCN guidelines and a Social Behaviour Change and Communication Strategy and Operation Plan for Nutrition, implementation of emergency infant and young child feeding (IYCF) activities and the strengthening of community-based nutrition and food-based programmes to contribute to the prevention of stunting. The agencies have also worked together on school-based support for weekly iron folic acid supplementation (WIFS) for adolescent girls and deworming for school children and, more recently in the COVID-19 context, the expansion of the iron folic acid initiative to reach 'out of school' adolescents through a community-based platform (currently in pilot phase with expansion dependent on funding).

Treatment scale up is hindered by problems with the ready-to-use therapeutic food (RUTF) supply chain. As discussed, supplies for wasting management are almost entirely based on off-budget funding. Integrating treatment supplies into the essential medicine supplies (EMS) list would allow the government to purchase RUTF and help to strengthen government procurement and supply

chain capabilities. Advocacy is ongoing to this end, however, this has been challenging given that RUTF is not currently integrated into the WHO global essential medicines list (EML). International procurement of RUTF is challenging – all supplies must pass through customs clearance in Karachi in Pakistan before being moved to Kabul for distribution (given that Afghanistan is landlocked) and this causes delays and breaks in the supply chain. Simplified protocols<sup>7</sup> for the treatment of severe wasting are currently being implemented as a means of mitigating recurrent RUTF shortages in the country with treatment outcomes closely monitored to observe trends. There is interest by the government to explore other cost-efficient alternatives to replace imported RUTF and improve programme sustainability, such as local commercial production and home-based product formulations.

Another important challenge is the lack of funding to sustain and scale up nutrition services. Most donor support currently either funds coordination activities (support for the Nutrition Cluster, for which there is no focal donor) or the procurement of treatment supplies for humanitarian actions. Unlike other sectors, there is no committed longer term investment in nutrition services. Health service delivery costs around USD180 million per year as part of SEHAT-MANDI. National spending accounts from 2018 reported that over 75% of expenditure is out of pocket, with households having to utilise their own resources to cover health service access. In this context, it is difficult to propose an additional USD48 million (at a minimum) to cover supply costs for full coverage of wasting treatment services. Other types of longer-term bilateral funding are urgently needed to support the government to sustain programming at full scale.

A further challenge is the overwhelming and increasing burden of wasting in Afghanistan,

driven by issues beyond the immediate causes of inadequate diet and disease, including household food insecurity (leading to children not receiving the right amount of the right foods at the right time), inadequate care and feeding practices, inadequate hygiene and sanitation and a lack of access to health services. These underlying causes must be tackled together in order to curb the increasing wasting burden. Prevention efforts are ongoing, for example through investment in the agriculture and health service sectors. However, investment is low compared to the contribution of the agriculture sector to the Gross Domestic Product (GDP) and existing agriculture and livelihoods programmes lack coverage and often do not apply a nutritional lens. Limited funding to address adolescent nutrition issues including high anaemia prevalence is also a major challenge.

### Putting prevention at the heart of wasting management – a vision for Afghanistan

#### Opportunities to enhance wasting treatment and prevention efforts

Prevention of wasting must be central to wasting management in Afghanistan. This requires the targeting of high burden and vulnerable communities with an integrated multi-sectoral package of nutrition, health, food security, social protection and water, sanitation and hygiene (WASH) interventions. Tackling the underlying causes of undernutrition and strengthening nutrition resilience must go hand in hand with accessible child wasting treatment services including the under six months age group.<sup>8</sup> Agricultural production, processing, storage, preservation and dietary diversification programmes are the main interventions being implemented as part of preventive approaches to improve access to nutritious diets, as well as social behaviour change programming. There is increasing coverage and promotion of food fortification and new evidence emerging on the availability of and access to local nutritious foods to inform future programming. The synergy between wasting prevention and treatment programmes must be improved to maximise their impact; there are currently limited referrals or shared planning between wasting treatment and livelihoods initiatives. Preliminary results from the 'Fill the Nutrient Gap' assessment conducted during the first quarter of 2020 show that one third of Afghans would not be able to purchase diets that meet just energy needs and four out of five households would not be able to purchase diets that meet all nutrient needs for health, development and growth. In response to drought and the COVID-19 pandemic, donors have become increasingly interested in

## Box 1 One UN for Nutrition: A catalyst for working together for women and children in Afghanistan

The 'One UN for Afghanistan' strategy was designed by all UN agencies under Sustainable Development Goal 2 Zero Hunger and is synergised with national policies and programmes.

The roles and responsibilities of key UN agencies working in nutrition in Afghanistan are understood in a continuum of care framework. UNICEF, WFP and WHO are more directly involved in the treatment of wasting while FAO and other agencies work on prevention by leading nutrition-sensitive initiatives.

UN agencies support the MoPH and Ministry of Agriculture, Irrigation and Livestock (MAIL) in technical coordination, development of strategies, guidelines/standard operating procedures, resource mobilisation, facilitation of technical working groups, capacity strengthening and programme delivery.

As part of One UN in Afghanistan, nutrition is integrated under thematic group area three linked to the Zero Hunger challenge, with nutrition-specific and nutrition-sensitive interventions coordinated by a small sub-group. Agencies are all also active members of other coordination platforms – both technical and multi-sectoral – including IMAM, MIYCN, Micronutrient, Assessment Information Management (AIM), Nutrition Program

Coordination Committee, Nutrition Cluster, Food Security and Agriculture Cluster (FSAC) and Afghanistan Food Security and Nutrition Agenda (AFSeN-A).

UN agencies work together on resource mobilisation – for example Afghanistan Humanitarian Fund allocations are discussed with all agencies and partners via the Nutrition Cluster. Development funding has also been secured, for example, to support a nutrition surveillance system implemented by UNICEF and WHO with the support of the Government of Canada. Longer term funding has proven to be more challenging to secure; a strong framework and advocacy approach is needed to leverage more resources.

For the COVID-19 response, all global guidance was tailored to Afghanistan and revised/validated by the Nutrition Cluster Steering Advisory Group (SAG), the Food Security and Agriculture Cluster (FSAC) as well as government-led technical working groups.

A joint implementation framework to address wasting is under discussion to harness the strengths and complementarity of individual agencies for greater synergy and more effective implementation for lasting outcomes.

<sup>5</sup> CBNP is a community participatory approach to strengthen community based nutritional services within the 1,000 days and includes community growth monitoring, mapping of foods seasonally, food demonstrations amongst other activities to empower communities to address their nutritional situation.

<sup>6</sup> Whereby mothers are trained to screen their own children for wasting using MUAC tapes.

<sup>7</sup> In October 2019 and in order to mitigate the impact of an anticipated shortage of RUTF nationally, the MOPH agreed to start implementing a simplified protocol in five provinces, involving the reduction of RUTF dosage for the treatment of SAM children.

<sup>8</sup> Partners are currently reviewing existing protocols and identifying options for implementation of community-based management of infant wasting.



social protection initiatives in which advocacy is succeeding in having a nutritional lens included. There are also opportunities to pilot and build the evidence on the impact of smaller scale social protection schemes.

## *New way of working for UN agencies in Afghanistan*

The policy and programming environment in Afghanistan shows promise for an integrated prevention and treatment approach to tackle child wasting. An opportunity to bring all necessary services together lies with the government-led Afghanistan Food Security and Nutrition Agenda (AFSeN-A) – a multi-sectoral agenda and approach (analogous with the Scaling up Nutrition (SUN) Movement) with the key objective of tackling stunting and improving the overall food security and nutrition of the population of Afghanistan. The AFSeN-A Strategic Plan 2019-2023 brings together key interventions and obligations under different government ministries, some of which are funded by on and off budgets,<sup>9</sup> and led by a technical secretariat (recently transferred from the Chief Executive's Office to the Administrative Office of the President (AOP)).

UN agencies in Afghanistan have an opportunity to bring together an integrated package of services to be delivered in high burden locations, within their complementarities and under the leadership of the government linked to the AFSeN-A Strategic Plan. The commitment to work together is already expressed within the One UN platform, however

under this agreement there is no joint framework for action which limits its impact. The recently developed Global Action Plan (GAP) on Child Wasting: framework for action is a global framework for action to accelerate progress in preventing and managing child wasting and the achievement of the Sustainable Development Goals (SDGs).<sup>10</sup> The AFSeN-A and agencies have also worked together on a complementary feeding framework with the same key areas of intervention as the GAP on Child Wasting: framework for action (health systems, food systems, WASH and social protection). These, and the development of an operational roadmap for Afghanistan, provide an opportunity to consolidate all efforts to date and bring the UN agencies together more concretely in Afghanistan to achieve enhanced outcomes. Based on the AFSeN-A Strategic Plan, the roadmap will identify agreed provinces for convergence and indicators to measure joint progress. The AFSeN-A technical secretariat will lead this process on behalf of the government to ensure that the result is in line with government priorities. Governance structures are in place to enable this through the AFSeN-A multi-sectoral coordination platforms at national and provincial levels. A common project document and monitoring plan to prevent and manage wasting nationally and in the selected priority provinces will be produced by the end of 2020.

To inform this process, the following steps are being led by the Government of Afghanistan with support from UN agencies:

- Mapping of current interventions of UN and non-UN agencies per province, guided by the AFSeN-A Strategic Plan. Box 2 illustrates current interventions implemented by UN agencies that are in line with the National Public Nutrition Strategy, Ministry of Agriculture, Irrigation and Livestock (MAIL) Food Security Nutrition (FSN) Policies/Strategies and the AFSeN-A Strategic Plan.
- Identification of key intervention areas to be prioritised, coordinated by AFSeN-A and MoPH/PND supported by UNICEF as Cluster Lead Agency (via Nutrition Cluster) and identified lead to coordinate the GAP on Child Wasting.
- Identification of funding gaps of mapped interventions to inform advocacy for government or bilateral funding and/or through other donors. A costing exercise will inform joint resource mobilisation between government and donors.
- Identification of areas to expand the fiscal space for funding of the action plan with government and donors.
- Reflecting the objectives of the SUN Movement in Afghanistan, advocacy for one focal donor for nutrition to coordinate and advocate for funding for nutrition with other donors.
- Stunting and wasting data will be collected on a five-year basis (Demographic Health Survey) using a comparable methodology (SMART).

## Conclusion

Reducing wasting to acceptable levels in Afghanistan is within reach. However, stronger commitments from the government and donors are key to complement ongoing efforts and make this possible. The global action plan (GAP) on child wasting offers an important opportunity to consolidate the work done and build on it. UN agencies in Afghanistan are strongly committed to work together, driven by the government under Afghanistan Food Security and Nutrition Agenda (AFSeN-A) and coordinating with key ministries, to develop and operationalise a roadmap for Afghanistan. The transitioning of AFSeN-A to the Administrative Office of the President (AOP) and the UN agencies' continuous collaborative intentions to jointly address the nutritional situation in Afghanistan makes the last quarter of 2020 a prime time for planning and advocacy. In the past, there has been over reliance on humanitarian funding for treatment services and no focal or champion donor to lead donor advocacy efforts. A broader funding strategy is urgently needed to support the effort to develop longer term solutions towards the sustained prevention and treatment of child wasting in Afghanistan.

For more information please contact Dr. Zakia Maroof at [zmaroof@unicef.org](mailto:zmaroof@unicef.org)

<sup>9</sup> On budget is financing by donors that is often channeled through government. Off budget is additional donor funding for projects and programmes and channeled through partners. There are efforts in Afghanistan to have these increasingly linked and aligned to prevent duplication and maximise use.

<sup>10</sup> <https://www.childwasting.org/the-gap-framework> and the views article in this edition entitled, "UN Global Action Plan (GAP) framework for child wasting and the Asia and Pacific Region"

## Box 2 UN agency priority and common nutrition and food security programming areas in Afghanistan

### FAO

- Technical support to Ministry of Agriculture, Irrigation and Livelihoods (MAIL), National Water Affairs Regulation Authority (NWARA), National Statistics and Information Authority (NSIA), National Environmental Protection Agency (NEPA) and other government line entities
- Backyard poultry farming
- Provision of lactating sheep and dairy processing tools
- Establishment of household level greenhouse
- Increasing milk production and collection
- Dairy processing and marketing
- Fertilisers and seed for potato and wheat
- Orchard production (cash crop)
- Water reservoirs, fodder reserves, dams
- Cash-for-work and provision of unconditional cash to the most vulnerable households
- Livestock protection package
- Kitchen and school gardening

### WHO

- Capacity building of the health system
- In-patient care for SAM support (milk preparation kits, medical equipment, medicine and training)
- Baby Friendly Hospital Initiative (BFHI)
- Growth monitoring and promotion
- Technical support de-worming (24-59 months) and vitamin A supplementation (6-59 months) through National Immunisation Day
- Promotion of a healthy diet
- Increasing awareness of people on WASH in health facilities including in-patient department SAM units

### UNICEF

- Out-patient severe acute malnutrition (SAM) support (health facilities, mobile teams)
- In-patient SAM support (therapeutic milk, ready-to-use therapeutic food (RUTF))
- Community based nutrition support
- Maternal, infant and young child nutrition counselling
- Adolescent nutrition (iron folic acid supplementation)
- Universal Salt Iodisation (USI) promotion
- Vitamin A (6-59 months) and de-worming (24-59 months) at national scale
- Formal and informal education support
- Water, sanitation and hygiene (WASH) in health facilities, schools and communities
- Support to maternal, newborn child health, including immunisation services
- Social behavior change (media, community dialogue)

### WFP

- Moderate acute malnutrition (MAM) treatment
- Support to pregnant and lactating women
- School nutrition: meals and mass de-worming in schools
- Malnutrition (stunting and wasting) prevention
- Infant and young child feeding
- Food systems strengthening – nutrition-sensitive food value chains
- Food fortification
- Social safety nets/cash transfers

## Nutrition Exchange South Asia issues on maternal nutrition and complementary feeding



**N**utrition Exchange (NEX)<sup>1</sup> recently developed two regionally focused editions exploring maternal nutrition and improving young children's diets in South Asia. These special issues followed on from two regional conferences jointly hosted by the United Nations Children's Fund (UNICEF) and the South Asian Association for Regional Cooperation (SAARC) held in 2018 and 2019. NEX articles across both special issues highlight work being done in South Asian countries to improve maternal nutrition and improve young children's diets through the development and mobilisation of an enabling policy, programme and financial environment – work that is fundamental for the prevention of child wasting.

Articles in the maternal nutrition edition reflect multi-sector efforts to improve nutrition counselling interventions, iron and folic acid (IFA) supplementation and access to antenatal care (ANC) services. Articles from **Nepal, Afghanistan** and **Pakistan** reflect the important role that community-based health workers (CHWs) play in improving maternal nutrition; largely through nutrition counselling and education services. In **Bhutan** this was extended to

other service providers in a multi-sector response where non-health officials were employed to promote ANC care. Building the capacity of CHWs and other actors to offer maternal nutrition counselling is deemed essential in several articles in this issue, with many training programmes being updated to include maternal nutrition. In **India** it was found that less than one third of undergraduate medical students knew about maternal dietary diversity and the correct dose of IFA supplementation during pregnancy. The development of a maternal nutrition curriculum for medical students has been proposed in response. Social behaviour change interventions are also reflected in articles. In **Sri Lanka**, in order to reach women pre-conception, newly married couples are invited to a pre-pregnancy care programme when they register their marriage. The programme includes education on maternal diet, including overnutrition and its potential implications for offspring. In **Nepal**, understanding that fathers play a major role in household decision-making, a motivational 'letter to the father' from the unborn baby is given to households during ANC visits to explain the role fathers can play during pregnancy and in raising a well-

nourished child. An article from **Karnataka State in India** outlines another option to improve maternal nutrition; a hot mid-day meal provided at Anganwadi centres for pregnant women to increase their calorie intake. Finally, articles from **Bangladesh** and **Pakistan** reflect the need to include data on maternal nutrition to understand the coverage and quality of services.

The issue on complementary feeding again reflects the importance of nutrition education and counselling by CHWs as a mechanism to improve diet diversity (as noted in **Punjab, Pakistan** and **Bihar, India**), as well as engaging more broadly with individual mothers, caregivers and, importantly, their influencers through text messages and social media. A multi-sector communication messages booklet on nutrition was developed for this purpose in Pakistan. In **Afghanistan** a positive deviance/hearth model is used to identify parents of children whose mid-upper arm circumference is in the 'green zone' as role models. These parents are requested to share their positive child-feeding practices with other parents. In **Sindh, Pakistan** water, sanitation and hygiene (WASH) and nutrition messaging are combined to improve diets and feeding practices for young children. Articles reflect the importance of combining counselling and social behaviour change communication (SBCC) with cash transfers to overcome barriers to affordability of high-quality foods (**Nepal** and **Bangladesh**). In **India**, instead of cash-based transfers, food supplementation through Anganwadi centres is used. In **Nepal** homestead food production support increases access to fresh foods for vulnerable families. In food-insecure populations, complementary food supplements, agriculture interventions and/or cash transfers can play an important role in supporting infant feeding.

A strong theme running through these publications is the importance of context-specific understanding of the perceptions and realities for families and communities. While the extent to which such interventions impact on wasting and stunting rates remains unclear, the stories in both editions offer powerful examples of potential mechanisms to prevent child under-nutrition in South Asia.

<sup>1</sup> Nutrition Exchange is an ENN publication that contains short, non-technical and easy-to-read articles on nutrition programme experiences and learning geared to individuals working to reduce levels of undernutrition at national, district and community levels.





# South Asia Technical Advisory Group on Wasting

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One of the major challenges in improving access for children to services to effectively prevent and treat child wasting in South Asia is evidence. Global normative guidance is largely based on research and evidence from other regions World Health Organization (WHO, 2013) which some researchers and policy makers argue does not account for the context in South Asian countries. For example, there are indications that poor maternal nutrition and low birth weight may be a stronger driver of child wasting (and stunting)

in South Asia than elsewhere and that much greater attention to the period between conception and six months is needed to lower the wasting burden. There are also ongoing debates in some countries as to how severely wasted children aged ≥6 months with no medical complications should be treated.

To resolve these issues, and given the very high prevalence and burden of child wasting in South Asia, it is crucial to build a stronger evidence base to inform the policy and programme response in the region. In November 2018, UNICEF convened a consultation of global experts from the Council of Research and Technical Advice on Acute Malnutrition (CORTASAM) and experts from the region to discuss the status of policy and programme action to care for severely wasted children in South Asia and to identify evidence gaps and research priorities (UNICEF, 2018). One of the agreed actions at this consultation was to form the **South Asia Technical Advisory Group (TAG) for Wasting** to support the generation and use of evidence to inform policies and programmes to address wasting in the region.

The South Asia Wasting TAG aims to provide technical leadership and guidance to identify and address critical research gaps on wasting in South Asia. It will also advise on the implications of new evidence for the design of policies and programmes in South Asia and for global normative and operational guidance. Building on existing global and regional research efforts, and working

alongside the global CORTASAM,<sup>2</sup> the South Asia Wasting TAG will:

- Identify and prioritise research and knowledge gaps on wasting epidemiology, prevention and treatment that are relevant to South Asia (see the Box 1)
- Support knowledge generation efforts by developing or reviewing research protocols, identifying researchers and academics to collaborate with and coordinating with global and regional donors to resource knowledge generation efforts
- Support the review, interpretation and dissemination of research findings including technical backstopping to emerging country specific and policy dialogue on wasting and severe wasting
- Support the review and validation of interim guidance based on new evidence.

Members of the South Asia TAG include representatives from United Nations (UN) agencies, academia, non-governmental organisations (NGOs), donors and technical experts working in South Asia and at global level. It meets biannually and is currently in the process of defining the research priorities on wasting in South Asia.

For more information, please contact [rosa@unicef.org](mailto:rosa@unicef.org)

## Box 1 Priority research areas of the South Asia Wasting TAG

- Epidemiology of wasting and severe wasting in South Asia (causes and distribution)
- Consequences of wasting and severe wasting on survival, growth and development in South Asia including linkages to stunting and other forms of malnutrition
- Screening and admission criteria to target children who will benefit most from treatment
- Implementation models and packages to prevent and treat acute malnutrition for all children with a focus on the first six months of life
- Cost-effectiveness of alternative approaches (products and implementation models) to treat severe acute malnutrition without medical complications for children 6-59 months

<sup>1</sup> See views article in this edition entitled “South Asia and child wasting - unravelling the conundrum”  
<sup>2</sup> The Council of Research and Technical Advice on Acute Malnutrition (CORTASAM) was assembled with the goal to drive the use of evidence to action in order to ultimately reach more children with effective treatment and prevention programmes. The members of the CORTASAM provide technical leadership to address critical research gaps and support the development of evidence-based operational and normative guidance. It is co-chaired by UNICEF and a leading researcher on wasting and brings together 14 leading academics and researchers.

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<https://www.unicef.org/rosa/reports/no-time-waste>



WFP staff attend to a participant in a Food and Cash assistance scheme Kano, Nigeria, September 2020

WFP/Damilola Onafuwa

## WFP win Nobel Peace Prize

Huge congratulations to the World Food Programme (WFP) for winning the Nobel Peace Prize for 2020! The prize was awarded to WFP “in recognition of its efforts to combat hunger, for its contribution to bettering conditions for peace in conflict-affected areas and for acting as a driving force in efforts to prevent the use of hunger as a weapon of war and conflict”. It is a reminder of how conflict, a man-made disaster, remains a scourge of our times - 68 million people are now displaced due to conflict and persecution (more than ever recorded), while the majority of the world’s refugees come from three countries devastated by war: Syria, Afghanistan and Somalia. In these troubled times when nutrition and food security needs more global attention and action than ever, this is something we can all leverage in our work wherever we are in the world.



## What's new at ENN?

### ENN strategic review: developing our new strategy together (2021-2026)

As global leaders in knowledge management, evidence and learning, ENN is embarking on a strategic review to see how we can drive more impact in our work, increase our reach and explore more new and innovative approaches. We are eager to learn what our readership thinks and what you could suggest for ENN's future.

To engage with us in this review please email [contact@enonline.net](mailto:contact@enonline.net)



### Management of at risk mothers and infants under six months (MAMI)

ENN is coordinator of the MAMI Special Interest Group (MAMI SIG), a well-established international community of researchers, programmers and policy-makers. This will soon be relaunched as the MAMI Global Network (thanks to the Eleanor Crook Foundation and Irish Aid) as we step up to meet the demands and needs to build evidence around MAMI, capture learning, engage across sectors and support programme development. Key recent areas of work include an update of the MAMI Tool (v2) to a MAMI Care Pathway – the result of a consultative process with a working group of MAMI SIG members and external experts in maternal mental health and early childhood development. An updated version will be available in October that will be piloted (by late 2020) and then tested in a randomised control trial in Ethiopia (London School of Hygiene and Tropical Medicine (LSHTM)/ENN/GOAL/Jimma University) in 2021. The MAMI SIG also led the development of a statement on MAMI in the context of COVID-19 in collaboration with the GTAM (see below) and available at: <https://www.enonline.net/mamiandcovid19statement>

visit <https://www.enonline.net/ourwork/research/mami> Contact: Eleanor Rogers, MAMI Global Network Coordinator, [eleanor@enonline.net](mailto:eleanor@enonline.net) or [mami@enonline.net](mailto:mami@enonline.net)



### Infant Feeding in Emergencies (IFE)

The IFE Core Group is a global collaboration of agencies and individuals formed to address policy guidance and training resource gaps to improve programming on Infant and Young Child Feeding (IYCF) in humanitarian contexts. Over the past four months, it has actively

engaged around COVID-19 support to policy and programmers (see GTAM, below). The IFE Core Group recently launched its strategy which sets the direction for the IFE Core Group for the next three to five years. The strategy takes into account how recent emergencies have expanded the scope of IYCF issues and modified ways of working in humanitarian contexts, for example, in response to crises occurring in more urbanised, middle-income countries where prevailing rates of breastfeeding are low. The group will now develop an action plan to build on the IFE Core Group Strategy. This will include the development of a communication strategy and tools for the dissemination of the Operational Guidance for IYCF-E.



For more information visit [www.enonline.net/ife](http://www.enonline.net/ife) or e-mail [ife@enonline.net](mailto:ife@enonline.net)

### Wasting and Stunting

A Story of Change (SoC) evaluation of the Wasting and Stunting Technical Interest Group (WaSt TIG) was conducted this year to examine the project's contribution in the research, programme and policy arenas. Key achievements identified included a strengthening of the evidence base on the relationship between wasting and stunting and accompanying shifts in research priorities and institutional policies. The report's recommendations were discussed in May during the WaSt TIGs bi-annual meeting (<https://www.enonline.net/fex/onlineonly>). The group reviewed progress on a number of workstreams, reflected on its ways of working and discussed priorities for the next two years. This rich discussion has generated a new membership and governance document and a workplan that will be finalised in the coming months.



### Adolescent nutrition

Since 2017, ENN has coordinated an informal group of around 80 researchers, practitioners and policy makers interested in adolescent nutrition. The 'Adolescent Nutrition Interest Group' meets virtually every quarter to share information and updates between members. Capitalising on the upsurge in interest around adolescent nutrition, ENN commenced a 'mapping exercise' this year in order to better understand who is doing what, where and when in adolescent nutrition programming. The first phase of the work involved an online survey that is currently being analysed and will be published shortly. Survey results will be supplemented by a series of key informant interviews aiming to

elicit more detailed information from a sample of respondents. In addition, a series of systematic literature reviews are being conducted to provide a global overview of the nutritional status of adolescents in regions with low- and middle-income countries.

For more information, please contact Emily Mates, Coordinator, at [emily@enonline.net](mailto:emily@enonline.net)

### Multi-sector nutrition programmes review

ENN recently completed the first section of a review, commissioned by Irish Aid, synthesising available evidence on the impact of multi-sector nutrition programmes (MSNPs) and the type and quality of monitoring and evaluation (M&E) systems used to measure impact. Despite growing attention to MSNPs, data demonstrating the efficacy, effectiveness and impact of multi-sector approaches on undernutrition are limited and information on the design of M&E systems is lacking. The wide range of evaluation designs used indicates the absence of minimum standards. Innovative solutions that allow for regular monitoring of stunting are needed to reduce reliance on small-scale surveys or infrequent Demographic and Health Surveys (DHS). Indicators of multi-sector convergence are also needed so that coverage of MSNP implementation is reported more systematically. The report that includes recommendations will soon be available on our website [www.enonline.net](http://www.enonline.net)



### Global Technical Assistance Mechanism for Nutrition (GTAM)

The GTAM is a platform that responds to technical requests by leveraging and building on existing nutrition resources, capacities, initiatives and coordination structures. During 2020, the GTAM rapidly mobilised to respond to demands for technical support from country actors relating to the COVID-19 pandemic. Global Nutrition Cluster (GNC) technical helpdesks, the Technical Rapid Response Team and ENN's en-net forum increased activities and Global Thematic Working Groups covering Infant and Young Child Feeding (IFE Core Group), Wasting and Nutrition Information Systems scaled up efforts to feed into and provide guidance and expert advice on emerging issues. Guidance, examples of programme adaptations and answers to questions raised can be found on the GTAM website <https://gtam.nutritioncluster.net/> and on the COVID-19 forum on en-net <https://www.en-net.org/forum/31.aspx>







## en-net update

Over the past six months (April to September 2020), 121 questions have been posted on en-net, generating 146 responses. The new forum area for COVID-19 and nutrition programming generated 66 questions, 18 of which were escalated to the GTAM Wasting sub-working group to facilitate responses. Thirty-six vacancy notices and announcements have been posted, accumulating 17,986 views. Although no training opportunities were shared, numerous posts across forum areas announced webinars.

The *Prevention and treatment of severe acute malnutrition* and *Prevention and treatment of moderate acute malnutrition* forum areas were recently merged into one *Management of wasting/acute malnutrition* area to better reflect the continuum of care and to enable discussions on prevention to be housed in one place.

To join any discussion on en-net, share your experience or post a question, visit <https://www.en-net.org/> or <https://www.fr.en-net.org/>

To provide feedback on the site, please write to [post@en-net.org](mailto:post@en-net.org)

## Sectoral learning

In September 2020, ENN hosted a webinar in collaboration with WHO on the guideline development process and plans for the update to the wasting guidelines by WHO throughout 2021. Available at: <https://www.enonline.net/mediahub/video/whowebinaronwastingguidelinesanddevelopment>

## NUTRITION EXCHANGE

### Nutrition Exchange

The second edition of a series of special issues of Nutrition Exchange on South Asia, born out of a partnership between ENN and UNICEF ROSA, was released in July 2020 on improving young children's diets. This follows the first edition published in June 2019 on maternal nutrition.

See the news item in this edition of *Field Exchange* for more information or visit [www.enonline.net/nex](http://www.enonline.net/nex)

## Field Exchange

### Field Exchange

In June 2020, as a follow-up to our special edition

on the continuum of care for wasting (issue 60), ENN delivered a webinar on key actions identified in this edition in the context of the GAP on Child Wasting: Framework for Action released in March 2020. The recording and a technical brief is available at: <https://www.enonline.net/mediahub/video/fex60gaponchildwastingwebinar>

*Nous sommes déterminés à faire en sorte de mieux documenter les expériences des praticiens francophones dans Field Exchange. Nous avons développé notre capacité afin de recevoir et traiter les articles en français. N'hésitez pas à nous faire part de vos idées - nous pouvons vous soutenir tout au long du processus de rédaction. Le contenu sera disponible en ligne en français puis traduit pour figurer dans l'édition imprimée de Field Exchange (en anglais).*

Coming up for *Field Exchange* we have two general issues due out in December 2020 and April 2021. We are also continually adding new articles to our website at [www.enonline.net/fex](http://www.enonline.net/fex) and in French at [www.enonline.net/fex/fr](http://www.enonline.net/fex/fr)

If you have programming experiences or research that you would like to share via *Field Exchange*, please contact Chloe at [chloe@enonline.net](mailto:chloe@enonline.net)

# Tackling child wasting: A review of costing tools and an agenda for the future

By Lani Trenouth, Emna Kayouli and Minh Tram Le



Jubil, age 2, recovers at the Kutupalong Makeshift Stabilisation Centre (MSC), where he is being treated for severe acute malnutrition (SAM)

There is emerging global recognition of the urgency of efforts to reduce child wasting. Of the estimated 47 million children under five years old who were wasted in 2019, just over half lived in South Asia. The overall prevalence of child wasting in South Asia is 14.8% – substantially higher than other regions of the world.<sup>1</sup> Given this, the call to action to address child wasting is especially pressing in this region, where governments are seeking to integrate proven treatment and prevention solutions into their national systems.

The financial investment required to implement a nutrition plan is an important element in the process of designing and prioritising nutrition interventions, yet much uncertainty remains around this critical aspect. Accurate costing of nutrition plans is labour-intensive and complex and, while there is a range of costing tools to facilitate analysis, each tool has its own strengths and weaknesses. Moreover,

guidance is lacking on detailed analytical choices made during the process of costing an intervention or plan.

In response, the United Nations Children's Fund (UNICEF) is engaging in a global exercise to facilitate the process of costing nutrition-specific interventions to address child wasting, with the support of its regional offices in the Asia and Africa regions. The result will be a comprehensive review of existing costing tools, an assessment of their applicability for costing nutrition interventions, and a synthesis to provide guidance on which tools are best to use under which circumstances. Country case studies will be carried out to validate the conclusions of the synthesis and to model real-life scenarios to estimate costs of select nutrition interventions in case studies in South Asia and globally. Detailed guidelines will be developed on how to standardise common analytical choices in costing and to generate cost scenarios. The specifics

of how wasting interventions may be implemented differently in each region will be factored into the guidelines.

It is anticipated that this exercise will foster greater consistency and transparency in costing processes, thereby improving cost data reliability and comparability and ultimately leading to better data on the cost of nutrition programmes for governments and partners to use in advocacy and planning to support the scaling up of wasting programming. The review of existing cost data of wasting interventions and synthesis of costing tools will be available by the end of 2020, with the costing guidelines to follow shortly thereafter.

For more information, please contact: Minh Tram Le, [mle@unicef.org](mailto:mle@unicef.org)

<sup>1</sup> UNICEF/WHO/The World Bank Group joint child malnutrition estimates: levels and trends in child malnutrition: key findings of the 2020 edition

## Integration of management of children with severe acute malnutrition in paediatric inpatient facilities in India

By Praveen Kumar, Virendra Kumar, Sila Deb, Arpita Pal, Keya Chatterjee, Rajesh Kumar Sinha and Sanjay Prabhu



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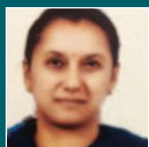
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The authors acknowledge UNICEF Delhi and National Health Mission, New Delhi for their support in running SAM treatment facilities at KSCH.

A mother and her newborn baby at Madhabnagar Rural Hospital, West Bengal



## INDIA

**What we know:** Children with wasting in India are currently managed as inpatients in nutrition rehabilitation centres (NRCs).

**What this article adds:** Due to limitations of treatment for severe acute malnutrition (SAM) in NRCs in India (lack of skilled manpower and capacity), inpatient management of complicated SAM cases was integrated into the paediatric wards of a large tertiary hospital in New Delhi. A nutritionist was stationed in each ward to take anthropometric measurements, administer therapeutic feeds and counsel caregivers. Operational research was undertaken to understand prevalence of SAM in paediatric wards, mortality rates in SAM children vs non-SAM children and observe protocol compliance. Between February 2018 and October 2019, of 3,444 admitted infants under 6 months of age (U6m), 44.8% had complicated SAM; of 6,758 children aged between 6 and 59 months, 27.6% had complicated SAM. SAM infants U6m had 3.44 times higher risk of death than non-SAM infants (9.1% vs 2.8%); SAM children aged 6 to 59 months had double the risk of death compared to non-SAM children (6.1% vs 3.0%). Challenges experienced during implementation included missed night feeds (due to less staff support at night), poor coordination of follow-up visits and lack of clear protocols for management of infants U6m. With additional staff capacity and training, inpatient management of complicated SAM can be integrated into paediatric wards in India to alleviate pressures on NRCs, increase treatment coverage and reduce SAM mortality rates.

### Introduction

Undernutrition contributes to around two-thirds of child mortality in India (Swaminathan et al, 2019), with many states across the country experiencing extremely high burdens. Progress has been made in the reduction of underweight and stunting in children under five years of age in India over the last decade, but levels of wasting have increased (Figure 1). There is an urgent need for more attention to its effective management, particularly in states with persistently high burdens.

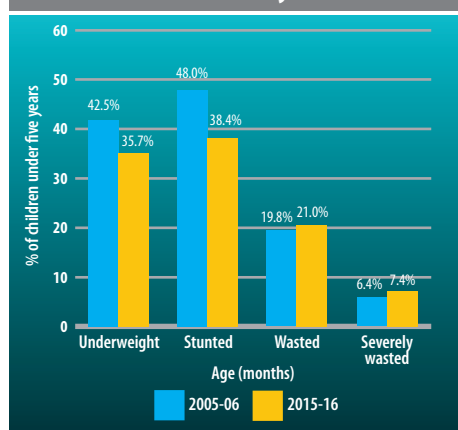
### Management of severe acute malnutrition (SAM) in India

#### SAM management guidelines

In 2007 a global joint statement was issued by the World Health Organization (WHO), World Food Programme (WFP) and the United Nations Children's Fund (UNICEF) in support of community-based management of acute malnu-



**Figure 1** Prevalence of underweight, stunting, wasting and severe wasting among children under five years old in India



trition (CMAM) to enable rapid scale-up of treatment services and prevent deaths associated with untreated SAM (WHO et al, 2007). The 1999 WHO guidelines on the management of SAM were updated in 2013 (WHO, 2013). In India, acute malnutrition management is guided by the 2007 Indian Academy of Pediatrics (IAP) and 2011 Ministry of Health and Family Welfare (MoHFW) guidelines for facility-level SAM management. These guidelines are currently being updated by the Government of India (GoI) to incorporate guidance on the management of uncomplicated SAM at community level. Ahead of this, a small number of CMAM programmes are currently being piloted in several states.<sup>1</sup>

**Nutrition rehabilitation centres (NRCs)** Currently in India, complicated cases of SAM<sup>2</sup> are treated in nutrition rehabilitation centres (NRCs) that are attached to existing inpatient paediatric facilities across all states. Children without medical complications may also be admitted at the NRCs, especially where no CMAM programs exist locally. NRCs provide management of medical complications, therapeutic feeding using locally prepared starter and catch-up diets (in place of standard F-75 and F-100), and counselling of caregivers on feeding and care practices. SAM cases receive additional routine services, including micronutrient supplementation, separately according to government guidelines (GoI, 2011).

#### Limitations of the NRC approach

The past performance of NRCs reveals that not all are functioning optimally. Studies suggest that, in the absence of CMAM programming, around 50 to 60% of SAM cases admitted to NRCs are medically uncomplicated, with mortality rates ranging from 0.4% to 3.5% (Aguayo et al, 2014; Aguayo et al, 2013; Singh et al, 2014). Inpatient care is expensive for the state and incurs high travel and opportunity costs for families (Puettet et al, 2012; Tekeste et al, 2012). High opportunity costs for families also impact access and utilisation of NRC services. Quality of care in NRCs is often impeded by lack of paediatric oversight (particularly when

NRCs are located outside of hospital premises) and lack of manpower in some states, as well as high staff attrition (Tandon et al, 2019). In practice, therefore, SAM children with medical complications are often admitted to inpatient paediatric departments, after which they are discharged home or to NRCs for further recovery.

Providing dedicated facilities for the management of its 9.5 million children under five years old with SAM (IIPS, 2017) is a huge challenge in India. An estimated 0.9 million of these cases have medical complications (assuming prevalence of complications is around 10%) and therefore require inpatient care.<sup>3</sup> Currently, there are around 1,100 operational NRCs across the country, with bed strengths ranging from 10 to 20. Even if run at 100% bed occupancy, assuming that all admissions are complicated SAM cases with an average stay of 15 days, only around 0.4 million children can be treated annually. Thus, even in the best-case scenario, existing NRCs in India can only treat 30% to 44% of all medically complicated SAM cases. Therefore, it is imperative that some inpatient care for complicated SAM cases is offered by paediatric wards in India, alongside community-based management of uncomplicated SAM cases, to enable necessary coverage of treatment services.

### Testing the feasibility of integrating management of complicated severe acute malnutrition (SAM) in paediatric wards

In response to this problem, the National Centre of Excellence (NCoE) for SAM Management, Kalawati Saran Children's Hospital (KSCH), New Delhi, in collaboration with United Nations Children's Fund (UNICEF) India, conducted operational research between February 2018 and October 2019. KSCH is one of the largest tertiary-care children's hospitals in Delhi, with a dedicated paediatric emergency ward, general paediatric wards, neonatal units, intensive care units and a 12-bed NRC unit. The NRC, established in 2012, initially only provided services to children admitted directly. However, between 2013 and 2015, its services were gradually expanded to SAM children in other parts of the hospital through the provision of therapeutic feeds to children admitted to other wards. This approach evolved further so that, from 2018, a dedicated nutritionist was placed in each of the three paediatric wards to carry out anthropometric measurements of all children aged under five years within 12 to 24 hours of admission, provide therapeutic feeds and conduct counselling sessions for caregivers.

To understand the impact of this approach, operational research was carried out at KSCH between February 2018 and October 2019 to study the prevalence of SAM among all children under five years old admitted for inpatient care in paediatric wards and their outcomes in relation to nutrition status. We also documented the experiences and challenges of integrating SAM management protocols within paediatric wards.

### Methods

Weight and height/length measurements were taken for each child and age established to calculate weight-for-length z-score (WHZ) and weight-for-age z-score (WAZ). For anthropometric measurements, a digital weighing machine (SECA 334) with a sensitivity of 5g, a UNICEF-supplied wooden infant-cum-stadiometer and non-stretchable mid-upper arm circumference (MUAC) tapes were provided. For infants under six months of age, SAM was defined as WAZ < -3 and/or weight-for-length z-score (WLZ) < -3 and/or bilateral oedema; for children aged 6-59 months, SAM was defined as WHZ < -3 and/or MUAC < 115mm and/or bilateral pitting oedema. All SAM cases were classed as complicated, given that they were admitted to the paediatric unit on the basis of their medical condition. Children with moderate acute malnutrition (MAM) were treated for their medical complications using standard protocols and nutrition counselling was given to their caregivers as per current government guidelines. SAM cases were treated according to SAM management protocols. Mothers of SAM infants under six months of age (U6m) were provided with breastfeeding support from the ward nutritionist and the dedicated infant and young child feeding (IYCF) centre in the hospital.

All children admitted to the hospital were followed from admission to outcome (defined for this study as exited alive; discharged as cured; leaving against medical advice (LAMA); defaulted; medically transferred; or died during treatment). Cured was defined as improved medical conditions, course of antibiotics completed, age-appropriate immunisation completed, and caregivers educated on appropriate childcare and feeding. For SAM cases, weight gain of 5gm/kg/day for three consecutive days was included as an additional discharge criterion from the facility. Following discharge, caregivers were counselled to bring their child for regular follow-up in the outpatient department and to attend community growth-monitoring sessions. Discharge from follow-up occurred when the child reached MUAC ≥ 125mm (if admitted using MUAC) or WHZ ≥ -2 (if admitted using WHZ).

Analyses were conducted to assess the overall caseload of SAM against total admissions in the study period (February 2018 to October 2019) and any difference in mortality rate between SAM and non-SAM children. Data was disaggregated by age (infants U6m and children aged 6-59 months). In addition to the quantitative study, periodical reviews were undertaken with

<sup>1</sup> See field article in this edition entitled "Community management of acute malnutrition in Rajasthan, India"

<sup>2</sup> Weight-for-length/height z-score (WHZ) < -3 and/or mid-upper arm circumference (MUAC) < 115 mm and/or bilateral pitting oedema with medical complications.

<sup>3</sup> When using Comprehensive National Nutrition Survey (CNNS) data (MoHFW, 2017) (a likely underestimation) the estimated caseload of medically complicated wasted children is 0.6 million; when corrected for incidence (using an incidence correction factor of 1.6 as suggested by Isanaka et al, 2016), this changes to between 0.9 and 1.4 million annually.



child. Therefore, SAM treatment is usually initiated on the basis of weight-for-age z score (WAZ) criteria alone. Appointment of a dedicated trained nutritionist in the paediatric wards supported the facility to comprehensively take all anthropometric measurements and admit SAM children according to national protocols.

### **Therapeutic feeding and breastfeeding support:**

The addition of ward nutritionists enabled SAM feeding protocols to be fulfilled. Ward nutritionists calculated the amount of starter feed (prepared with cow's milk, sugar, rice powder and vegetable oil to provide approximately 75 kcal and 0.9g protein per 100 ml) and catch-up diet (to provide approximately 100 kcal and 2.9g protein per 100 ml) to be offered to admitted SAM children, based on their daily weight measured between 10am and 11am. Starter and catch-up diets were prepared in the NRC unit and the correct amounts for 24 hours for each child were distributed to wards in jars and kept in refrigerators. In the daytime each feed was provided by the nutritionist posted to that ward. Having a staff member dedicated to administering feeds through the night was not feasible; therefore, night feeds were provided by caregivers (based on the guidance given by the nutritionist) with follow-up each morning by the nutritionist.

While this protocol was largely successful, reports demonstrated that caregivers commonly missed one to two night feeds per night, indicating a weak point in management. Night feeding has been found to be poorly adhered to in general in NRCs in India, indicating this to be a problem across different settings (GoI, 2011; Aguayo et al, 2014; Singh et al, 2014). Other challenges were the use of site-prepared starter and catch-up diets; experiences in other hospitals (Box 1) suggest that there may be utility in using WHO recommended F-75 and F-100 therapeutic milk products to aid quicker recovery. This needs further investigation. For infants under six months of age, breastfeeding support was provided by nutritionists in each ward and the hospital infant and young child feeding (IYCF) support centre. However, support using the supplementary suckling technique could not be provided in this context.

health staff, and caregivers and the researcher's own observations were documented. Integration experiences were also documented for BaiJerbaiWadia Hospital in Mumbai (Box 1).

### **Results**

All admissions for the period (n=10,214 children) were enrolled in the study, 12 of whom were excluded from the analysis due to incomplete data. Of the 10,202 (99.9%) children included, 3,444 (33.8%) were U6m and 6,758 (66.2%) were aged between 6 and 59 months. Of the infants U6m, 1,543 (44.8%) children were SAM using WLZ<-3 and/or WAZ<-3 and/or bilateral oedema criteria. Among children age 6-59 months, 1,865 (27.6%) children had SAM (WLZ/WHZ<-3 and/or MUAC<115mm and/or bilateral oedema).

A total of 3,249 (94.3%) infants U6m and 6,496 (96.1%) children aged 6 to 59 months exited alive and a total of 195 (5.7%) infants U6m and 262 (3.9%) children aged 6 to 59 months died during treatment. Among those who exited alive, 85.6% (n=8732) were discharged as cured, 10.1% (n=1033) were defaulters and 4.3% (n=437) were medical referrals to other facilities. Among the 1,543 severely malnourished infants U6m (by WHZ and/or WAZ), inpatient mortality was 9.1% (n=141) compared to 2.8% (n=54) among non-severely malnourished children (Figure 2). Severely malnourished infants U6m were at 3.44 (OR 3.44, P<0.001) times higher risk of inpatient mortality compared to non-severely malnourished infants in this age group. The inpatient mortality

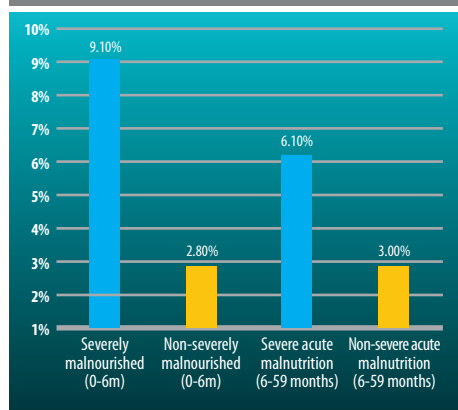
rate of SAM children aged 6 to 59 months was 6.1% (n=114) compared to 3.0% (n=148) among non-SAM children (Figure 2). SAM children in this age group were at twice (OR 2.09, P<0.001) the risk of inpatient mortality compared to non-SAM children.

### **Discussion**

Results reveal that a large proportion of children admitted for inpatient paediatric care had SAM and that these children had elevated risk of mortality compared to non-SAM children, particularly in the U6m age group. This highlights the critical importance of identifying and appropriately managing children with SAM in paediatric inpatient settings in India, particularly in states with high burdens of wasting/severe wasting. The present study shows that medically complicated SAM cases can be effectively managed in this context with some additional training for existing staff and the addition of a nutritionist in each ward. This protocol has potential for providing greater coverage of inpatient complicated SAM treatment in response to the limited capacity of NRCs and reducing mortality risk in this vulnerable group. Observations revealed several challenges during implementation that needed to be overcome, as follows:

**Identification:** Kalawati Saran Children's Hospital (KSCH) is a tertiary-care hospital with large numbers of patients that is always overcrowded. As a result, it is not routinely possible to record length/height and MUAC for every admitted

**Figure 2** Inpatient mortality of severely malnourished and non-severely malnourished infants and children



### **Box 1** Integration experiences from BJ Wadia Hospital, Mumbai

BJ Wadia Hospital for Children in Mumbai is the largest paediatric tertiary-care hospital in western India. An integrated nutrition rehabilitation centre and paediatric ward system for the management of severe acute malnutrition (SAM) was implemented in 2019. During 2019, 211 patients with SAM were treated in this new system following WHO SAM management protocols using WHO-recommended F-75 and F-100 formulations.

Since the programme began, 182 (86.3%) of SAM children have been discharged as cured, with average weight gain of 5.7g/kg/day and mortality rate of 2%. A total of 76% of children were fully cured at 12 weeks of follow-up (defined as reaching weight-for-length z score (WHZ  $\geq 2SD$ ) at Anganwadi centres. Average length of stay in the hospital was 10.7 days. Of the admitted SAM cases, 54 (25.6%) were infants under six months old (U6m), who were managed with F75 and intensive breastfeeding counselling and support. Reported advantages of using F-75 and F-100 were easier preparation and storage, correct micronutrient mix, and acceptability in the majority of patients. Paediatric staff considered use of commercially prepared F-75 and F-100 to have contributed to the high performance indicators of this programme. In addition, nutritional care was started immediately on admission, night feeds were always given and no anthropometric measurements were missed.



**Management of shock and anaemia in sick SAM children:** Deviations from national guidelines were observed in the management of shock, dehydration and anaemia. Most of the resident doctors are trained in and follow Paediatric Advanced Life Support guidelines, which recommend larger bolus for children with shock. Resident doctors were reoriented regarding fluid therapy for SAM children and observations suggest that most complied. However, even though the WHO and Government of India (GoI) guidelines recommend blood transfusion only for SAM children with haemoglobin less than 6g/dL in the presence of cardiorespiratory distress, doctors on duty deviated and gave transfusions to children with haemoglobin less than 8g/dL, in line with critical care guidelines but contrary to SAM management guidelines.

**Counseling sessions/play therapy:** We initially faced difficulty organising counselling sessions for mothers and caregivers because there was no dedicated cubicle for management of SAM children in the hospital. Cases were dispersed across the paediatric wards and it was difficult to bring their caregivers together for counselling sessions. We tried to overcome this problem by keeping all haemodynamically stable SAM children in one cubicle to enable group sessions. This was also logistically helpful for the daily weight monitoring of children with SAM to monitor their progress.

**Discharges before meeting discharge criteria:** Several patients were discharged on resolution of medical complications but before reaching criteria for nutritional recovery.

**Follow-up of discharged children:** Follow-up was extremely challenging to coordinate. Since these children were discharged from paediatric units, they were called for follow-up in outpatient department units, where it was difficult to trace them due to overcrowding. To address this, in future SAM cases will be discharged to the Paediatric Gastroenterology, Hepatology and Nutrition clinic for the first and fourth follow-ups. Second and third follow-ups will be carried out in the community by accredited social health

activists (ASHAs) or Anganwadi workers at Anganwadi centres, where they will also receive take-home rations. Caregivers will be counselled to this effect.

### Next steps

The present experience shows that integrating management of SAM within hospital paediatric wards can provide a wider and more sustainable model of care for medically complicated SAM children and increase treatment coverage. To be effective, this model requires the equipping of paediatric wards with additional infrastructure and ward nutritionists. This approach will also be greatly facilitated by clear protocols of SAM management of infants U6m and the release of the forthcoming updated Government of India (GoI) operational guidelines for the facility-based management of severe acute malnutrition (which will include clearer guidance on follow-up procedures). Other necessary inputs will be training of all paediatric medical staff in the management of SAM and routine screening for SAM in paediatric wards. There is anecdotal evidence that the use of commercial F-75/F-100 may help in the successful management of SAM cases in this context, as quality assurance of locally prepared therapeutic feeds in paediatric wards is challenging.

The authors of this paper submitted a report of the findings described to the GoI Ministry of Health and Family Welfare (MoHFW). The MoHFW has accepted the integration of complicated SAM management into paediatric wards as an effective and sustainable approach. In the upcoming revised operational guidelines, all paediatric health facilities will therefore be advised to designate four to five beds in their paediatric ward as beds for the management of SAM children with medical complications. SAM children with acute medical conditions who may need intensive care should be managed in the Paediatric Intensive Care Units (PICUs)/Paediatric ward, where providing such intensive care is possible. These children will receive therapeutic feeds and other components of SAM management in PICU/Paediatric wards.

Once these children are stabilised, they can be moved to NRC beds.

Findings also highlight the key role of paediatricians in the management of SAM with complications, which has been absent in many NRCs. The upcoming SAM operational guidelines will therefore advise that new NRCs should only be established in those facilities where paediatric care is available. States should also bring existing NRCs under the supervision of paediatricians from the health facility (district/sub-district hospital) for appropriate medical management of SAM children with complications. An existing paediatrician deployed in the health facility should be designated as the NRC incharge, responsible for medical management in the NRC.

The MoHFW will also recommend the establishment of one state centre of excellence (SCoE) for SAM management where there are more than 25 NRCs. The SCoE will be located at a government medical college with a pediatric department with functional SAM management facilities. The SCoE on SAM management will provide technical advice on all matters related to programme implementation and monitoring and evaluation, and will provide training content for different levels of health worker for the NRCs.

### Conclusion

This study is one of the few to examine the utility of the management of children with SAM in paediatric wards in India according to national guidelines for the management of complicated SAM. There are certain challenges in managing these children in paediatric wards that need to be overcome. However, despite these challenges, the study suggests that the routine screening for and appropriate management of SAM cases with medical complications on paediatric wards, with support for the nutritional management of these cases from on-site NRCs, is an effective model for ensuring the appropriate inpatient management of children with SAM with medical complications at scale.

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# Managing at risk mothers and infants under six months in India – no time to waste

By Praveen Kumar, Sila Deb, Arjan de Wagt, Piyush Gupta, Nita Bhandari, Neha Sareen and Satinder Aneja



A mother with her new born baby in Gadchiroli, Maharashtra



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## INDIA

**What we know:** Current protocols in India do not allow for the adequate identification and management of nutritional risk in infants under six months of age.

**What this article adds:** Drawing from international learning, a group of experts in India developed new protocols for the management of at risk mothers and infants under six months of age (MAMI) for the identification of infants at moderate nutrition risk (for community management) and severe nutrition risk (for facility management). A training package for health workers on inpatient MAMI was developed and piloted at 10 nutrition rehabilitation centres (NRCs). Protocols were subsequently rolled out at the same NRCs between February and May 2019. A total of 258 infants was identified (69% severe and 31% moderate; moderate cases were included in lieu of community-based management not being available in India). Most breastfeeding mothers required breastfeeding support; skilled breastfeeding counselling resolved feeding difficulties in half of cases, while the remaining mothers received support using the supplementary suckling technique (SST). Success of SST depended on adequate and skilled manpower, including during the evening and night. Key challenges for roll-out of MAMI protocols in India will be ensuring an adequate and trained health workforce at both facility and community levels and provision of psychosocial support for mothers.

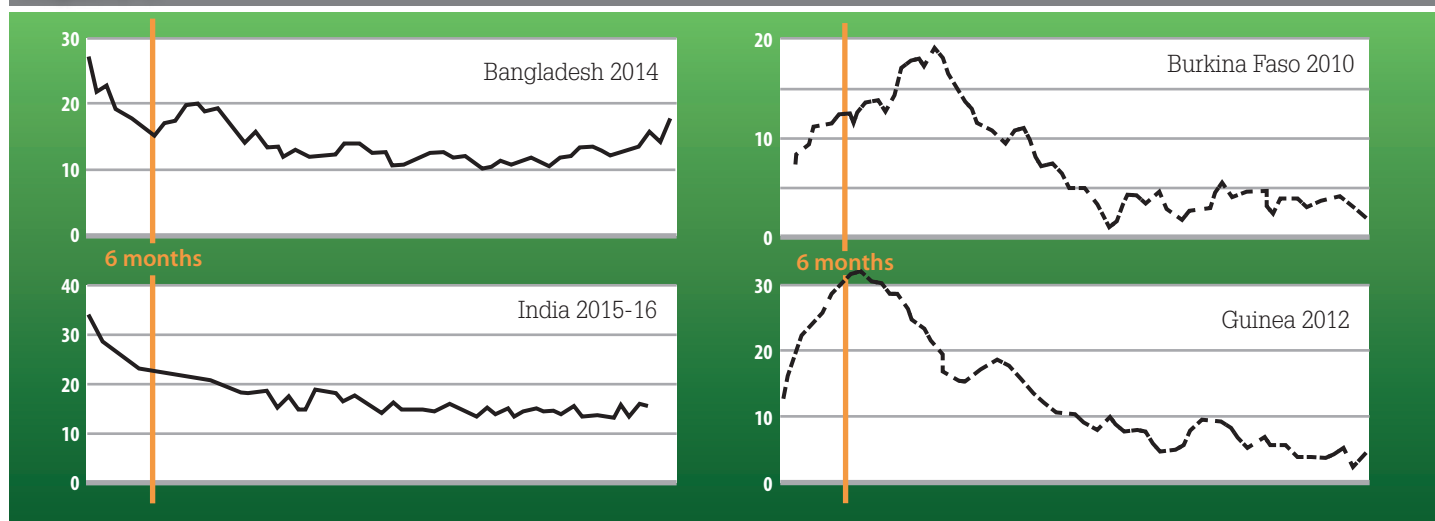
## Background

### *Malnutrition in infants under six months in India – a significant public health problem*

Adequate nutrition during the first six months of life is crucial for appropriate growth and the formation and development of the nervous system (Cusick and Georgieff, 2016; Fox *et al*, 2010). There are approximately 4.7 million infants under six months old (U6m) worldwide who are moderately wasted (weight-for-length  $\geq -3$  to  $< -2$  z) and 3.8 million who are severely wasted (weight-for-length  $< -3$  z) (Kerac *et al*, 2011), making malnutrition in this age group a significant global public health problem. The issue of U6m malnutrition is particularly serious in India, where the prevalence of wasting in this age group is 31.9% and that of severe wasting is 14.9% (IIPS, 2017). The prevalence of wasting is highest at birth (37%) and declines with age (IIPS, 2017) – a similar pattern to that seen in other South Asian countries, such as Bangladesh, but different to the pattern seen in west and central Africa, where prevalence of wasting is relatively low at birth and increases in infancy, peaking at around 12 months of age (WHO and UNICEF, 2004; de Wagt *et al*, 2019) (Figure 1).

This highlights that the origins of early-life undernutrition in South Asia often begin in utero with intrauterine growth restriction (IGR), resulting in many infants



**Figure 1** Wasting prevalence (%) by age-based Demographic Health Survey (DHS) reports

being born with low birth weight (LBW) each year. Of the 20.5 million LBW infants born annually in low- and middle-income countries, around 9.8 million are estimated to live in South Asia (UNICEF and WHO, 2019); it is estimated that 75% of infants born with LBW in South Asia live in India alone (Lee *et al*, 2013). A child born with LBW has higher risk of death in infancy and those who survive have higher risk of morbidity and acute malnutrition during infancy and early childhood. Individuals born with IGR are also at greater risk of non-communicable diseases such as hypertension, diabetes and dyslipidaemia in adulthood after a period of rapid weight gain (Hales *et al*, 1991). This highlights the imperative to address growth failure during pregnancy and in the early stages of life in South Asian countries. This is a central focus of the recently launched POSHAN Abhiyaan programme in India, which aims to improve antenatal care and breastfeeding practices nationwide, with a central target of decreasing LBW by 2% per annum.

### Current state of care for vulnerable infants in India

To manage those infants born at risk, the Government of India (GOI) under the National Health Mission (NHM) has established special newborn care units (SNCUs). SNCUs provide specialised care to infants who are born preterm (<34 weeks) or birth weight of <1,800g<sup>1</sup> and other sick neonates under 28 days of age. To date, 844 SNCUs have been established in district hospitals and medical colleges across India, treating nearly one million newborns per year (MoHFW, 2020). SNCUs undoubtedly save many lives, demonstrated by almost one million fewer newborn deaths in India in 2017 compared to 2000 (UNICEF, 2020).

At community level, the Home Based Newborn Care (HBNC) programme was launched in 2011 to accelerate the reduction of neonatal mortality rates, particularly in rural, remote areas where care is otherwise inaccessible. Accredited social health activists (ASHAs) undertake seven follow-up visits of all infants during the

first 42 days of life, including LBW infants and infants discharged from SNCUs (day one is taken as the discharge date from SNCU), with ongoing follow-up for 18 months for all LBW infants (including infants born <1,800g admitted to SNCUs and infants born 1,800-2,500g in the HBNC programme) and 12 months for non-LBW preterm infants. During seven follow-up visits, ASHAs provide support to the mother to sustain exclusive breastfeeding for six months, ensure continued kangaroo mother care, perform regular growth monitoring, and identify signs of sickness in mothers and infants for early referral (MoHFW, 2014). After 42 days ASHAs provide an additional five follow-up visits to infants between 3 and 15 months of age under the Home Based Care for the Young Child (HBYC) programme. These visits are designed to improve nutritional status of young children, ensure proper growth, early childhood development, and prevent childhood illness (such as diarrhoea and pneumonia) and deaths resulting from them (MoHFW, 2018). In addition, some nutrition rehabilitation centres (NRCs) manage acutely malnourished infants U6m according to national severe acute malnutrition (SAM) protocols (those with weight-for-length z-score of <3SD or bilateral pitting oedema).

An important weakness of this current system is the lack of clarity on how to identify infants at nutrition risk (not just those already severely acutely malnourished) and appropriate actions for their management. Growth failure in infancy, resulting in infant malnutrition, is a complex, multifactor problem associated with many risk factors that encompass maternal, infant and social characteristics. A failure to identify and avert risks early is a key weakness of the existing system that inhibits the provision of nutrition care for this key vulnerable group.

### MAMI approach in India – the opportunities

The Management of At Risk Mothers and Infants U6m (MAMI) Special Interest Group<sup>2</sup> developed the Community-MAMI (C-MAMI) tool<sup>3</sup> as a first step to help support the identification and

management of uncomplicated, nutritionally at-risk mother-infant dyads in the community consistent with recommendations of the 2013 updated World Health Organization (WHO) guidelines (WHO, 2013). The encouraging results of pilots in Ethiopia and Bangladesh (Butler *et al*, 2018) sparked interest among Indian experts striving to improve the care of at-risk mothers and infants in India. As a result, two expert group consultation meetings were held to discuss evidence related to early growth failure identification and MAMI at facility and community levels in India.

The first consultation was held in October 2018 to discuss current understanding of growth patterns and deviations in early infancy. The co-lead of the MAMI Special Interest Group<sup>4</sup> attended the consultation to share global MAMI learning and experience of using the C-MAMI tool. As follow-up, a group of experts developed a training package to strengthen inpatient care of infants under six months old (U6m) with severe malnutrition. With the approval of the Government of India (GoI) Ministry of Health and Family Welfare (MoHFW), the training package was subsequently piloted in 10 selected nutrition rehabilitation centres (NRCs). Experiences of the pilot study are shared below.

A second consultation was organised in October 2019 to further discuss and finalise algorithms and guidelines for the identification and management of infants U6m at nutrition risk in the community. Presentations by government representatives and eminent national scientists and ensuing discussions among experts from different states, the United Nations Children's Fund (UNICEF), Save the Children, and the Breastfeeding Promotion Network of India (BPNI) provided the basic framework for finalising operational and technical guidelines on

<sup>1</sup> LBW infants born 1,800-2,500g are managed in the Home Based Newborn Care (HBNC) programme.

<sup>2</sup> An international collective of programmers, policy-makers and researchers, coordinated by Emergency Nutrition Network (ENN) [www.enonline.net/ourwork/research/mami](http://www.enonline.net/ourwork/research/mami)

<sup>3</sup> C-MAMI tool (version 2) 2018 [www.enonline.net/c-mami](http://www.enonline.net/c-mami)

<sup>4</sup> Marko Kerac from the London School of Hygiene and Tropical Medicine (LSHTM)



Visit to the pilot Nutrition Rehabilitation Centre

## Box 1 Integration experiences from BJ Wadia Hospital, Mumbai

1. Infants under 6 months of age (U6m) will be classified into three categories according to their nutritional risk: *not at risk, moderate risk of malnutrition, and severe risk of malnutrition.*
2. For identifying 'at-nutrition risk' infants, assessment in the following four broad areas will be used:
  - a) assessment for sickness as per Integrated Management of Neonatal and Childhood Illnesses (IMNCI) guidelines;
  - b) assessment for breastfeeding and feeding practices;
  - c) determination of weight-for-age (WFA) as per WHO 2006 growth standards; and
  - d) assessment of maternal nutrition, health and psychosocial status.
3. If an infant has not regained birth weight by day 14, and/or has gained weight less than 20g/day (<150g/week) after the second week of life, they should be carefully assessed for any sign of sickness; feeding problems, including breast attachment and positioning; and maternal nutrition, health and psychosocial problems.
4. During each home/health facility contact, the infant's nutritional risk should be classified as one of: *not at risk, moderate risk of malnutrition, or severe risk of malnutrition (Table 1).*
5. Existing government platforms should be effectively utilised to identify and manage at-nutrition risk infants.
6. Infants U6m at *moderate risk of malnutrition* should be managed in the community by trained mother's absolute affection (MAA) frontline workers. All frontline workers, Anganwadi Workers (AWWs) who are not trained or who have sub-optimal skill should be trained/reoriented to take correct anthropometric measurements of infants and assess for signs of sickness. They should be empowered to identify infants at nutrition risk and help mothers with breastfeeding problems by improving attachment and positioning. If there is poor weight gain, even after two weekly contacts, or if there is further weight loss during the follow-up visit after one week, the infant should be referred to a health facility for evaluation.
7. Infants U6m at *severe risk of malnutrition* should be referred and managed at health facilities with nutrition rehabilitation centres (NRCs) or a paediatric facility with staff trained to help mothers with breastfeeding problems.
8. The nutrition division should strengthen services for mothers at severe nutrition risk at state and districts level, including the provision of support to mothers with adverse psychosocial status (currently limited to bigger hospitals).
9. Attempts should be made to improve convergence between programmes at ground level, including the Integrated Child Development Services (ICDS) programme, the Home Based Newborn Care (HBNC) programme, the Home Based Care for the Young Child (HBYC) programme, and Village Health Sanitation and Nutrition Days (VHSNDs), and to harmonise existing guidelines.
10. In the rare circumstances where there are no prospects of breastfeeding (such as in cases where the mother has died or is seriously ill and unable to breastfeed, the infant has been adopted, or the mother is unable to breastfeed successfully even after counselling and support), health workers should help families choose the best suitable replacement feeding option after discussing each option's advantages and disadvantages. Options include: donor human milk, infant formula and fresh, undiluted animal milk. If the mother is unwell, exclusive breastfeeding should be re-established once her condition becomes stable. Mothers and caregivers of babies receiving infant formula or animal milk should be empowered to feed their infants with good hygiene, without over-dilution and with a *katori/paladai*\*. Bottle-feeding should be proactively discouraged as a potential source of infections among infants.

\* *Katori* is a stainless-steel bowl commonly used in India to feed children. *Paladai* is a low bowl with a spout (feeding device) traditionally used in India.

*Early growth failure: identification and management through existing Government platforms.* Following further revisions by participants, a final draft of the guidelines was presented to MoHFW with the recommendations outlined in Box 1. The recommendations leverage existing government health platforms for MAMI (including the Home Based Care for the Young Child (HBNC) programme, the Home Based Care for the Young Child (HBYC) programme, and Village Health Sanitation and Nutrition Days (VHSNDs) (MoHFW, 2019)), utilising existing health workers, including accredited social health activists (ASHAs), anganwadi workers (AWWs) and auxiliary nurse midwives (ANMs). The new guidelines have been agreed in principle, but no official order for their implementation has been issued as yet.

## Pilot Management of MAMI programme

### *MAMI training programme*

A four-day pilot training using the new inpatient care training package on management of infants under six months old (U6m) with severe malnutrition was held in November 2018 by the National Centre of Excellence on Severe Acute Malnutrition (NCoE SAM), with support from the United Nations Children's Fund (UNICEF), at Kalawati Saran Children's Hospital (KSCH), New Delhi, with the approval of the Ministry of Health and Family Welfare (MoHFW). A total of 27 participants from nutrition rehabilitation centres (NRCs) in 10 states<sup>5</sup> attended, including paediatricians, medical officers, nutritionists and staff nurses. The training covered the following topics (similar to proposed guidelines): identification of infants U6m; care and management of infants U6m with prospect of being breastfed; management of infants who need relactation support; discharge criteria and follow-up; and conducting sensory stimulation and structured play therapy with age-appropriate toys. Training methods included classroom reading, watching videos and group clinical sessions (covering the taking of anthropometric measurements; calculation of standard deviation scores; and identification and management of infants at nutrition risk).

### *MAMI implementation experiences*

Following the pilot training, staff from the 10 selected NRCs implemented the new protocol for the screening and classification of infants as: *not at nutrition risk, at moderate nutrition risk and at severe nutritional risk.* Infants U6m at moderate and severe nutritional risk were admitted and managed in NRCs, in line with proposed guidelines. Experiences of admitting and managing infants U6m during the pilot period (February to May 2019) were documented and shared with NCoE SAM monthly. Of 890 children presenting across the 10 NRCs during the study period, 258 (~29%) were infants U6m; over two thirds (69%) of whom were identified as having severe nutritional risk and admitted

<sup>5</sup> Bihar, Delhi (Kalawati Saran Children's Hospital), Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Uttar Pradesh.



**Table 1** Classification of infant nutritional risk

Severe risk of malnutrition	Moderate risk of malnutrition	Not at risk
Referred for inpatient care	Manage in the community	Praise and advise routine care
At first visit: Birth weight <1,800gm	<ul style="list-style-type: none"> <li>Birth weight 1,800-2,499gms</li> <li>SCNU graduate</li> </ul>	Birth weight ≥2,500g
<ul style="list-style-type: none"> <li>Not able to feed</li> <li>Weight loss between two consecutive visits, even after nutritional counselling after 2nd week of life</li> <li>Sudden loss of weight (loss of more than 10% from previous record in a week)</li> <li>Congenital anomalies interfering with feeding (cleft palate, etc.)</li> </ul>	<p>OR</p> <ul style="list-style-type: none"> <li>Not regained birth weight by day 14</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Moderate/severely underweight (&lt;-2SD W/A) or moderate/severely wasted (&lt;-2SD W/L)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Static weight between two consecutive visits even after nutritional counselling</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Breastfed with any of the following feeding problems:               <ul style="list-style-type: none"> <li>Poor attachment</li> <li>Not suckling effectively</li> <li>Less than 8 breastfeeds in 24 hours</li> <li>Weight gain less than 150gm/week after 2nd week of life</li> <li>Receives other foods or drinks</li> <li>Oral ulcers/oral thrush</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Not breastfed at all with any of the following:               <ul style="list-style-type: none"> <li>Weight gain less than 150gm/week</li> <li>Milk incorrectly or unhygienically prepared</li> <li>Giving insufficient replacement feeds</li> <li>Using a feeding bottle</li> </ul> </li> </ul>	<p>AND</p> <ul style="list-style-type: none"> <li>Exclusively breastfed</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>W/A or W/L = &gt; -2SD,</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Has gained weight &gt;150 gm/week from last visit after 2nd week of life and maintaining growth trajectory as per WHO growth chart</li> </ul> <p>AND</p>
Severe malnutrition /severe illness /severe psychosocial issues in the mother	Adverse maternal health/nutrition/psychosocial status	No adverse maternal health/nutrition/psychosocial status

Key: W/A = weight-for-age; W/L = weight-for-length

for inpatient care. Of the severe cases, 9.6% had length <45cm.<sup>6</sup> The remaining 31% of infants were identified as having moderate nutritional risk. These infants were also admitted for care but could have been managed in the community, had community-level services been available.

A monitoring checklist assessed adherence to inpatient treatment protocols during supportive supervision (this checklist was designed for the pilot programme, although there are plans to use it for future supervision). The majority of NRCs adhered to the protocols; however, deviation from protocols for electrolyte supplementation of potassium and magnesium was seen in some NRCs due to a lack of clarity on whether health workers should supplement infants with prospects of breastfeeding or not. Staff from four NRCs reported operational challenges, including lack of stock supply of antibiotics and micronutrient supplements, and lack of personnel to manage evening and night shifts, leading to non-adherence to protocols, particularly with regard to support for the supplementary suckling technique (SST). Temperature recording and antibiotics were administered correctly, but blood glucose testing was irregular in three NRCs.

Out of 258 infant U6m admissions, 208 (80%) had prospects of breastfeeding (the mother

was available and either currently breastfeeding or had stopped breastfeeding within the last two months). Of these, 166 (79.8%) had incorrect breastfeeding attachment and positioning, which was corrected in over half of cases (55.4%, n=92) with counselling and support from NRC staff. The remaining mothers with prospects of breastfeeding were supported using SST. A total of 47 mothers (who had not breastfed for longer than two months) consented for relactation by SST. Full success was seen in 45% (21/47) of cases; partial success was observed in 25% (12/47) of cases and was not successful in 30% (14/47). NRCs with more success with SST had adequate and skilled manpower; those with less success with SST had less skilled manpower available, particularly during evening and night shifts.

### Key learnings from the pilot programme

The pilot programme demonstrated that, with training support, most NRCs can successfully identify and manage infants U6m at nutrition risk. The majority of mothers with prospects of breastfeeding had incorrect breastfeeding attachment and positioning, which was rectified in over half of the mothers through breastfeeding counselling. These infants could have been successfully managed in the community using ex-

isting government platforms if health workers providing these services were trained to provide this level of breastfeeding support.

Other infants U6m required admission to the NRC either for the management of medical complications or to implement SST. For these cases, the success of treatment depended on the availability of a paediatrician and round-the-clock supervision. Non-availability of human resources for evening and night shifts led to non-adherence of protocols in the NRCs. This is a key point of weakness in the current system that must be resolved with adequate manpower and appropriate staff training. It was noted that, after a gap of more than three months from cessation of breastfeeding, the success rate for relactation decreased. This highlights the critical importance of early intervention in mothers with breastfeeding problems.

### Maternal health and nutrition services in India

The wellbeing of an infant is determined to a large extent by the wellbeing of their mother. The Management of At Risk Mothers and Infants under six months of age (MAMI) approach therefore always considers the infant-mother pair and includes a maternal mental-health care component. In the India context, the nutritional management of mothers is complex, both in terms of lack of availability of food and difficulties in the implementation of maternal nutrition programmes at the grassroots level. In 2011 the Government of India (GoI) launched the Janani Shishu Suraksha Karyakaram (JSSK) programme to provide free transport, drugs, diagnostics, blood and supplementary food to pregnant women delivering in health institutions (MoHFW, 2011). Several other schemes (including Anganwadi services, schemes for adolescent girls and Pradhan Mantri Matru Vandana Yojna (PM-MVY) under the umbrella of the Integrated Child Development Scheme (ICDS)) also provide interventions to address the problem of malnutrition among women and children in the country (MoWCD, 2017). Support services also exist to address the multi-sector social determinants of health that affect women's uptake of existing health services, including economic status, caste, ethnicity, maternal education, husband education, religion and culture. GoI programmes addressing this problem include Janani Suraksha Yojana (JSY), JSSK, Village Health Sanitation and Nutrition Committees (VHSNCs), and Village Health Sanitation and Nutrition Days (VHSNDs), which provide an institutional platform to foster convergence and address social determinants of health at ground level. Linkages with such services will be necessary for future successful community and facility-based MAMI.

An important challenge in India is the lack of existing services for maternal psychosocial assessment and support; maternal mental health has only recently come to be recognised as im-

<sup>6</sup> Length <45cm was not included as a specific risk criterion as most infants of this length will be identified by the weight-for-age criteria.

portant for the wellbeing of at-risk mothers and infants. Currently, dedicated maternal mental health services are largely deficient in health facilities and health workers lack training in mental health issues. Availability of mental health specialists is also limited in peripheral healthcare facilities. Moreover, postnatal traditions (such as the period of seclusion at home observed in many cultures and reluctance of mothers to disclose mental health problems due to social taboos and stigma) negatively affect care-seeking behaviour in the postpartum period (Upadhyay et al, 2017). In the absence of adequate social support, identifying families' psychosocial problems may further complicate issues. Although a challenging task, there is an urgent need to develop convergence and strong linkages between psychiatry, medicine, child development and maternal and social development to manage both mothers and their infants effectively.

## Management of MAMI in India – the way forward

In India, with high prevalence of severe wasting in infants aged under six months (U6m), it is not possible to provide inpatient care to all such infants. Given the profile of many infants requiring intervention, inpatient care is also not the best setting for their support. The ability to test the utility and feasibility of community-based management of infants U6m at moderate risk of malnutrition in India through existing government platforms could provide a major step forward in preventing growth failure and malnutrition in this vulnerable group.

Recently, the Prime Minister of India launched the flagship programme POSHAN Abhiyaan. This programme has given new hope for the provision of a continuum of care to improve nutritional outcomes for children, adolescents, pregnant women and lactating mothers through a comprehensive package of convergent interventions across multiple government schemes and programmes. Included in this in-



A new born baby in Gadchiroli, Maharashtra

UNICEF India/2017/Ashutosh Sharma

tegrated package is community-based management of SAM as one of a range of nutrition-sensitive and nutrition-specific interventions. The Ministry of Health has also launched the Mother's Absolute Affection (MAA) programme to improve breastfeeding practices, which will be utilised for the scaling up of training of in-service health personnel to empower them to provide skilled support to mothers with breastfeeding problems. This provides a real opportunity to scale up widespread support for mothers to identify growth failure at the earliest possible point and provide a targeted intervention to avert further deterioration, and ultimately to prevent severe malnutrition in this critical age group. The pilot study described here demonstrates the utility, where infants continue to deteriorate or present key indicators of nutritional risk, of providing skilled, facility-based support to improve their nutritional status before discharge back into the community. This includes use of the supplementary suckling technique (SST), the success of which requires a high level of skilled personnel both day and night. This level of support must be factored into nutrition rehabilitation centres (NRCs) and pae-

diatric facilities across India to ensure the viability of this approach.

We acknowledge that low birth weight and early growth failure is a huge problem in infants U6m in India. We have existing systems and government platforms and a large cadre of health workers across the country to deliver community-based health and nutrition programming from pre-pregnancy until five years of age to address these issues in a comprehensive manner and at scale. Should these systems and platforms be fully utilised, inpatient care for infants U6m may only be required for those at severe nutritional risk and who do not improve with community-based interventions, which is likely to be a more cost-effective approach for both government and families.

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*The C-MAMI Tool referred to in this article is currently being updated into a MAMI Care Pathway by the MAMI Special Interest Group. Dr Praveen Kumar is part of a working group informing this update. For more information, visit [www.ennonline.net/ourwork/research/mami](http://www.ennonline.net/ourwork/research/mami)*

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# Supporting healthy growth in infants in low-resource settings in Mumbai, India

By Rupal Dalal, Shruthi Iyer, Marian Abraham and Lahari Yaddanapudi



Mothers and infants in a 'Mommy and Me' developmental class, FMCH programme, Mumbai, India, 2019

UNICEF India/2017/Ashutosh Sharma



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## INDIA

*What we know:* Maternal undernutrition, low birth weight and growth failure in early infancy contribute to wasting, stunting and underweight.

*What this article adds:* The Foundation for Mother and Child Health (FMCH) is a grassroots organisation working in the slums of Mumbai. Resources were targeted to pregnant mothers, infants and young children (aged up to three years) through a '1,000 days initiative'. Programming involved active growth monitoring from birth with early and intensive interventions using contextualised nutrition and breastfeeding counselling tools (45 counselling points emphasising 'cross-cradle hold'), clinic follow-up, home visits and community/peer group support sessions. Innovative technology supported weight monitoring (software), counselling and health-worker training (online videos). Data analysis from a cohort of 286 children followed between 2013 and 2016 found that underweight fell by 47.5%, stunting fell by 18.7% and wasting fell by 16.7% (severe wasting fell by 67.7%) between baseline (average age 2.2 months) and endline (average age 13.9 months). In a cohort of 80 children followed to 25.9 months (average), decreases were recorded in prevalence of underweight (33%); stunting (28.1%) and severe wasting (40%), but wasting increased (by 33.3%). Data from a small cohort of infants (n=51) supported by newly trained government health workers and tracked from birth until the fourth week of life found good average weight-gain rates (37g/kg/d). The experiences indicate that contextualised, targeted, quality counselling focusing on critical moments in the lifecycle is necessary and effective. Close growth monitoring from birth is critical to track progress and inform early action. Training and supervision of the existing health workforce to support service quality is needed and possible in a low-resource, challenging setting.

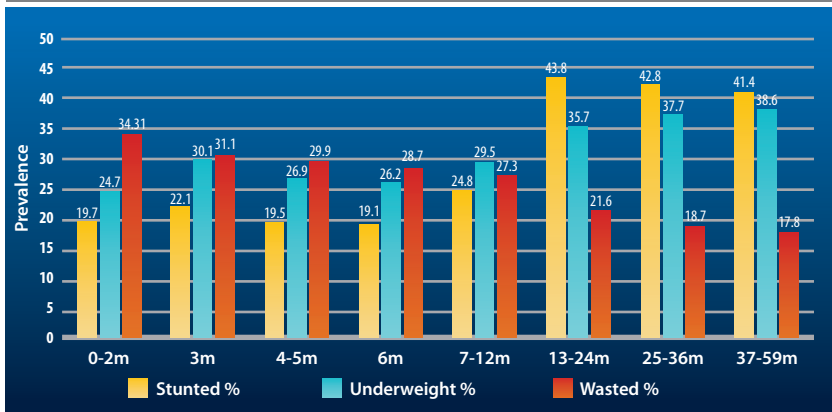
## Background

Despite significant reductions over the years, India still has high rates of undernutrition among children under five years of age, 38.4% of whom are stunted, 21.0% wasted and 35.8% underweight (IIPS, 2016a). In addition, an estimated 18.2% of infants are born with a low birth weight (LBW) (IIPS 2016b). Figure 1 demonstrates that, while the prevalence of stunting and underweight increase with age in India, peaking in later infancy and young childhood, the prevalence of wasting is highest between birth and two months of age (IIPS, 2016b). This highlights the in-utero origins of infant undernutrition in this context and the critical importance of interventions to support maternal nutrition in pregnancy and

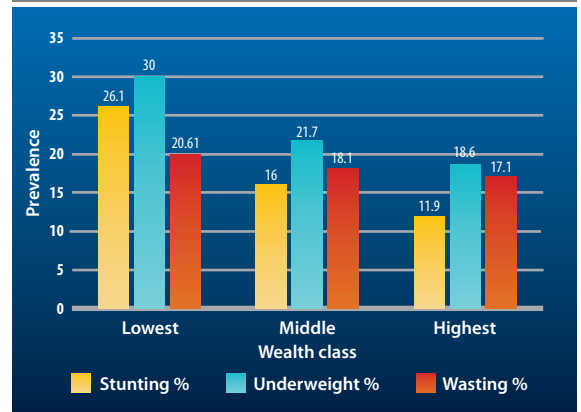
to avert growth faltering and aid catch-up growth in infancy.

Mumbai is the capital city of the state of Maharashtra on the west coast of India and is the largest, most densely populated city in the country. Analysis of the nutritional status of infants by household wealth in Mumbai shows a strong correlation between undernutrition and low socioeconomic status (poverty); particularly for underweight and stunting (Figure 2). There is also a very high prevalence of LBW among the poorest households in Mumbai (Figure 3), which demonstrates the in-utero origins of undernutrition in this population and the need to focus on optimal nutrition in pregnancy in this vulnerable group.

**Figure 1** Nutritional status by age (months) – National Family Health Survey (NFHS-4) 2015-16



**Figure 2** Nutritional status by wealth in Mumbai



Source: HUNGA MA Report, 2014

### Foundation for Mother and Child Health (FMCH) 1,000-days initiative

FMCH is a grassroots organisation founded in 2006 to improve the access of vulnerable communities in the Dhobi Ghat area of Mumbai to health and nutrition interventions. Dhobi Ghat is a low-income area with an estimated population of 50,000, characterised by informal community shanties ('slums'). As part of its pre-school education programme, FMCH initiated monthly nutrition and health monitoring and catch-up on missed vaccinations for attending children and their younger siblings, as well as nutrition counselling and cooking demonstrations for caregivers. Over time, health and nutrition programming was refocused on the first 1,000 days plus one more year (up to the child's third birthday), rather than all children under six years of age, as this is the period with most potential to avert growth faltering and reverse the early impacts of undernutrition on stunting in the context of limited programme resources. In response, a set of key activities, displayed in Figure 4 and described below, were implemented in the areas of Ganesh Nagar, Ramdev Nagar and Sukhawani.

Newborns and children under three years of age were brought by their mothers/caregivers to the clinics (monthly if weight gain was good and more frequently if not) for mothers/caregivers to

receive one-to-one counselling with trained health workers, including field officers, social workers, nurses, nutritionists and a doctor. At each visit, infants and caregivers were supported with:

**Growth monitoring:** Two trained field officers took weight and length/height measurements of infants using calibrated machines (discrepancies were checked by a third officer). Measurements were entered into a customised, cloud-based software program to generate World Health Organization (WHO) z-scores and automatically plot percentile weight-for-age, length-for-age and weight-for-height charts, and results were shared with the mother/caregiver. If a child was identified with medical complications or developmental delay, they were referred for management at the closest nutrition rehabilitation centre or paediatric hospital as appropriate.

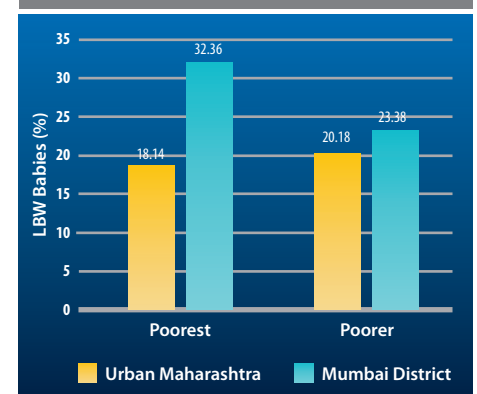
**Breastfeeding support and counselling for mothers of infants and young children:** Breastfeeding mothers and their infants were assessed using digitally completed WHO breastfeeding assessment forms. Breastfeeding counselling was provided using a '45 points of counselling' card developed over several years of learning in this programme (Box 1). Target weight gain was minimum 30g/day for babies under three months of age and 20g/day for babies between four and six months old. If target weight gain was not achieved, further breastfeeding counselling was provided, with follow-up after 48 hours, either

in-clinic or at home. Once the mother was comfortable and target weight achieved for two consecutive visits 48 hours apart, the child was referred for monthly follow-up. During clinic visits mothers and infants were provided with vitamin supplements and mothers were counselled on newborn safety, exposure to the sun to raise vitamin D levels, developmental activities, home remedies for illness and protocols for antibiotic use (to prevent over-the-counter use of antibiotics for viral illness). A prophylactic dose of iron was given to infants from four months of age to prevent anaemia. Very few non-breastfed infants were seen in the clinic; where this happens, support is given for relactation.

**Complementary feeding support:** Mothers of babies over six months of age were given one-on-one counselling on complementary feeding using information, education and communication charts designed for caregivers and pregnant and lactating mothers. Strict follow-up was carried out every two weeks from six to eight months of age. Once mothers were following minimum adequate dietary advice and the baby was showing healthy growth, children were referred for monthly follow-up until reaching three years of age. Iron and vitamin supplements were given to this age group. During the initial years of the programme, it was noted that the growth of infants of complementary feeding age (over six months of age) often plateaued; this was seen most often in children of vegetarian households.



**Figure 3** Prevalence of low birth weight (<2.5kg) in urban Maharashtra and Mumbai district



Source: NFHS-4



# Figure 4

Key activities undertaken at Ganesh Nagar, Ramdev Nagar and Sukhawani by FMCH



To sustain weight and length gain and prevent growth faltering, vegetarian mothers were counselled to prepare nutrient-dense powders at home using peanut, sesame or other seeds, germinated or roasted beans and amylase to add to foods for their infants. Non-vegetarian mothers were counselled to include eggs, fish, chicken, liver and red meat to their infant's diet from six months onwards. Following the introduction of this counselling, we observed that children over six months old continued to grow well and those with growth faltering quickly recovered. Counselling was supported with age-appropriate recipe booklets in local languages for mothers of infants at six, eight and 12 months of age.

Weekly cooking demonstrations were carried out with mothers of infants of complementary feeding age, as well as pregnant mothers. Recipes using locally available, cheap, nutrient-dense foods were used and cooked meals were fed to the children. During sessions, responsive feeding, consistency, dietary diversity and hygiene practices were discussed. Anaemia was checked at one year of age using portable HemoCue machines (for point-of-care haematology testing) and children were treated with a therapeutic dose of iron if they were found to be anaemic. From one year of age, children were given deworming medicines twice per year.

**Counselling and support for pregnant mothers:** Pregnant mothers attended the clinic regularly for weight monitoring and one-to-one counselling on nutritious diets. A weekly supply of clinic-made nutrient bars was provided, as well as iron and calcium supplements. Women were encouraged to join pregnancy clubs for group discussions on various topics related to pregnancy, including nutrition, breastfeeding and newborn-care training. Once the infant was born, field officers visited registered mothers in hospitals to guide them in early initiation of breastfeeding, positioning and attachment. On discharge, breastfeeding support was provided through regular home and clinic visits.

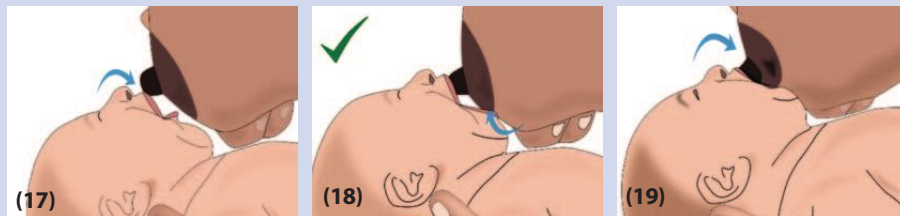
**Home visits:** Home visits were an integral part of the programme and involved visits by FMCH team members for one-on-one counselling of pregnant women and caregivers on maternal, infant and young child feeding hygiene, and to help families access more support if needed. Mother and infant pairs were also encouraged to attend 'Mummy and Me' classes on infant and child development, including communication, massage and play.

**Development of tools:** Recently, FMCH has started using advanced information, communication and technology tools, such as the Health Spoken Tutorials prepared by the Spoken Tutorial Project of the India Institute of Technology (IIT) and guided by the experience of FMCH programme staff. The Health Spoken Tutorial educational content portal<sup>1</sup> and its YouTube channel offer self-paced, multilingual tutorials for pregnant women and caregivers on breastfeeding skills, complementary feeding, maternal nutrition, adolescent nutrition and infant care topics. Women who have access to smart phones

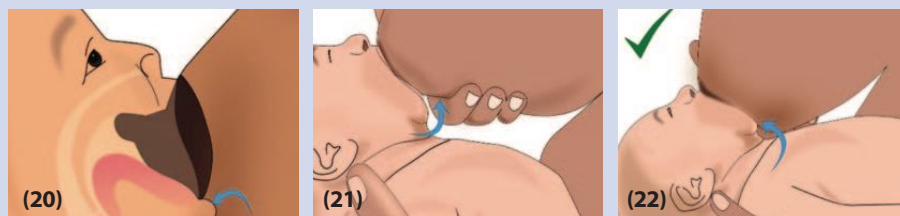
## Box 1 A selection from 45 counselling points for effective breastfeeding - Latching the baby to the breast<sup>2</sup>

### Latching

- To open the baby's mouth wide, mother should touch her nipple to baby's upper lip (Image 17)
- When baby opens her/his mouth wide, glide the breast into the mouth (sometimes this may take a few minutes, but it is of utmost importance to wait patiently for the baby to open her/his mouth wide)
- Two-point latch. Latch the lower lip first, then the upper lip. The upper lip should be resting just above the nipple and the lower lip should be resting at the border of the areola and the breast (Images 18 & 19)



- Lower lip curved outwards (Image 20)
- In big breasts/well attached baby, press breast upward near the lower lip to check if significant part of lower areola is in the mouth (Image 21)
- Chin should be embedded well in the breast (Image 22)



watch the content at home or in the clinic. The videos were well received by women in FMCH clinics, with positive feedback on their success in supporting good breastfeeding technique.

### Monitoring and lesson learning

Protocols were supported by customised, cloud-based software programs that included all relevant forms, including those for WHO breastfeeding assessment, well child, diet, severe acute malnutrition/moderate acute malnutrition management, home visits and activities. Software also supported the calculation of WHO z-scores and percentile growth charts. This enabled the efficient collation of data for individual and programme-monitoring purposes. Since the customised software was cloud-based, data could be remotely monitored in real-time by the team, including the clinic doctor, to ensure that each child was followed up appropriately and growth faltering identified and addressed. Challenging cases were immediately referred to the team doctor and nutritionist for appropriate, urgent action.

Monitoring data revealed many common problems experienced by mothers, such as poor breastfeeding positioning and attachment, and infrequent feeding. This detailed information helped the team tailor the '45 points of counselling' card to address the most common issues faced and enable effective decision making.

### Programme impact

An analysis of baseline and endline malnutrition indicators was undertaken between 2013-2016 for all children who entered the programme under six months of age until at least their first

birthday (286 children:153 boys and 133 girls). These children were selected based on age at registration (< 6 months), breastfeeding status (exclusively breastfed) and availability of follow-up data between 12 and 24 months of age. Length-for-age (LAZ), weight-for-age (WAZ) and weight-for-length (WHZ) z-scores were recorded at 0-6 months (baseline) and at 12-24 months of age (endline) for each child and prevalence levels of undernutrition calculated (Figure 5). Average age was 2.2 months at baseline and 13.9 months at endline.

In this cohort the prevalence of wasting, underweight and stunting were reduced between the baseline and endline periods. The decreases were particularly high for prevalence of underweight (decline by 47.5% in WAZ) compared to stunting (decline by 18.7% in LAZ) and wasting (decline by 16.7% in WHZ). Severe wasting declined by 67.7%, severe underweight by 67.4% and severe stunting by 32.7%. The progress in reduction in undernutrition over this short period (1 to 1.5 years) was high for stunting (6.3 percentage points) and underweight (16.1 percentage points). As there was no control group (this was not set up a research study), data from NFHS-4 (2016/17)<sup>3</sup> helped contextualise the findings. Cautious comparison suggests a considerably lower prevalence of undernutrition

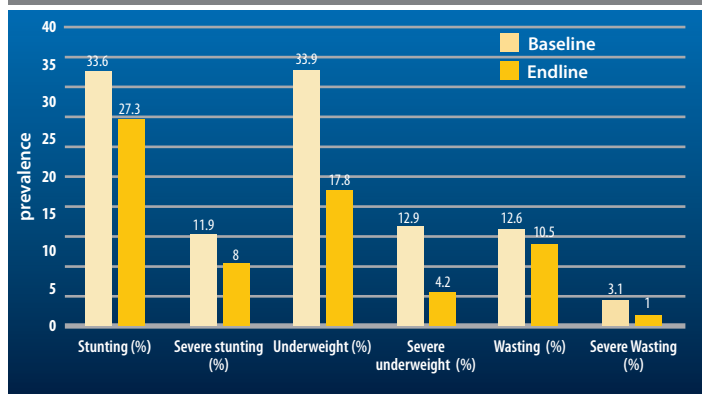
<sup>1</sup> [https://spoken-tutorial.org/series\\_tutorial-search/?search\\_otherfoss=Health+and+Nutrition](https://spoken-tutorial.org/series_tutorial-search/?search_otherfoss=Health+and+Nutrition)

<sup>2</sup> The full '45 points of counselling' card is available in the online version of this article at [www.enonline.net/fex/63](http://www.enonline.net/fex/63)

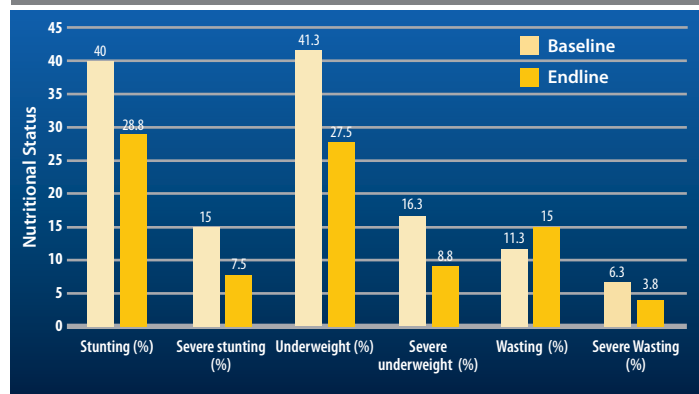
<sup>3</sup> Data will have been gathered in 2014/15, coinciding with the intervention programme data collection; hence this data was selected for contextualisation.



**Figure 5** Baseline and endline nutrition status of a sub-sample of children (n=286) registered with FMCH at Ganesh Nagar, Ramdev Nagar and Sukhawani



**Figure 6** Baseline and endline nutrition status of a sub-sample of children (n=80) registered with FMCH at Ganesh Nagar, Ramdev Nagar and Sukhawani over three years



amongst the intervention group compared to prevalence amongst a similar age group (13-24 months), the lowest quintile of the urban sample at state level (27.3% v 42.6% stunting, 17.8% v 35.4% underweight and 10.5% v 26.5% wasting at 13-24 months of age).

Data was collected from a sub-sample of 80 children of the same cohort for whom data was available from 24 months of age onwards to understand the longer-term impact of the programme on its beneficiaries. Data was analysed to compare prevalence of stunting, underweight and wasting between baseline (0-6 months) and endline (>24-35 months). The average age at endline of this sample was 25.9 months. In this population a reduction of 28.1% was seen in prevalence of stunting, 50% in severe stunting, 33.3% in underweight, 46.2% in severe underweight and 40% in severe wasting (Figure 6). However, there was an increase of 33.3% in wasting. Similarly, prevalence of undernutrition in this older sub-sample was considerably lower compared to children of similar age (25-36 months) in the poorest quintile for the urban state sample (28.8% v 39.9% stunting, 27.5% v 42.2% underweight, 15% v 23.6% wasting) (NFHS4, 2016/17).

### Building the capacity of the government health workforce

Maternal and infant and young child feeding training was recently provided to government health workers in the Department of Health and Department of Women and Child Development in tribal areas of Melghat, Maharashtra.

Online Health Spoken Tutorials were used to train medical officers, Anganwadi supervisors, counsellors and block facilitators on a range of topics (Box 2). Trainees were equipped to cascade this training to other government health workers who provide counselling to mothers. After completion of training, participants took a written exam, attended a practical workshop with demonstrations using a model breast and doll, and received practical training from a supervisor. Participants were tasked with following 10 babies for one month (with remote support via WhatsApp and referral of non-responsive cases to the medical officer). The cost of the training was minimal as it used free online tutorials, with practical sessions using low-cost tools.

Data from infants monitored and counselled by newly trained government health workers from the Department of Health in Banaskantha district in Gujarat (medical officers, auxiliary nurse midwives and accredited social health activists) demonstrate early success of the training programme, with many infants reported to be gaining over 40g per day. Figure 7 presents data of 51 infants who received counselling from newly trained health workers from Banaskantha district with at least four weekly follow-ups who were between 26-31 days of age at their last visit. This shows that, between birth and last follow-up, over 62% of infants gained 30g or more weight per day and almost 8% gained 60g or more per day, with mean weight gain of 37g/day.

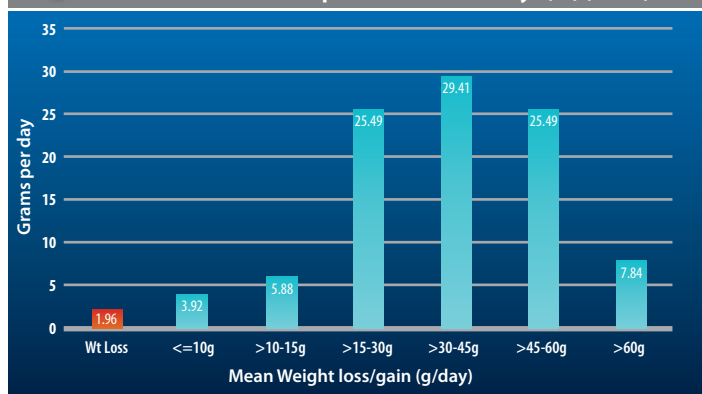
Another cohort was analysed of infants (n=154) who entered their fourth week of life (aged >21

days) for whom data was available. Of these infants, 17.5% (n=27) were born with a weight of < 2.5kg (LBW). Among the 40 infants with a record from their first week of life, mean weight gain was negative at -7.7g/day; mean weight gain for infants with a record in their second week (n=106) was 22.3 g/day; in their third week (n=101) 40.5g/day; and in their fourth week (n=107) 42.6g/day (Figure 8). Results highlight the importance of effective breastfeeding training.

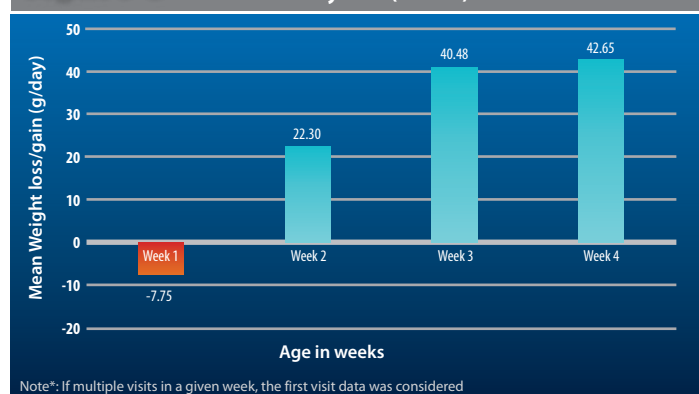
### Discussion

Contextualised, targeted, quality counselling focusing on critical moments in the lifecycle is necessary and effective. The Foundation for Mother and Child Health programme developed a set of protocols and accompanying tools tailored to needs and challenges faced by caregivers in this context. This included online videos created by the India Institute of Technology (IIT) Bombay to support counselling targeted to key points in the lifecycle (pregnancy, infants under six months exclusively breastfeeding, and infants and young children of complementary feeding age). The 'cross-cradle hold' and '45 points of counselling card' were critical to the success of this intervention. The experience highlights the importance of a deep understanding of the issues faced in a specific context and the development of protocols and tools that respond to these. The experience also demonstrates the importance of empowering pregnant and lactating women and caregivers with information so that they understand why and how actions should be taken to achieve optimal growth of their infants.

**Figure 7** Infant progress according to weight gain from birth to last follow-up between 26-31 days (%) (n=51)

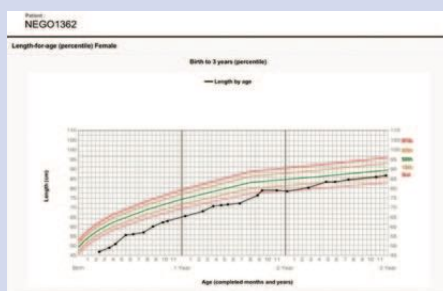
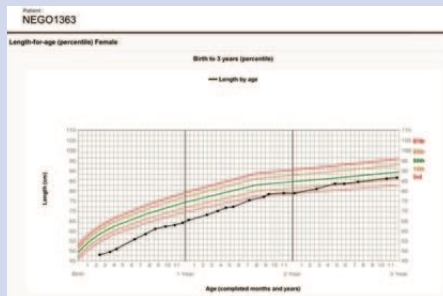


**Figure 8** Mean weight gain (g/day) by week for a cohort of infants >21 days old (n=154)



## Case study 1

The first two growth charts below are of twin girls who were admitted to the clinic at around two months of age. They were severely stunted at the time of admission (height-for-age Z-scores (HAZ) nearly  $<-6$  SD), as reflected in their World Health Organization (WHO) percentile growth chart. Their mother received counselling in breastfeeding and complementary feeding from six months of age. Response was much slower than experienced with other children; however, over time, both girls gained slow and steady length and their stunting was reversed by the time they were 27 months of age.



18-month-old twin girls who were admitted to the programme at two months of age and who had reversal of stunting by 27 months of age

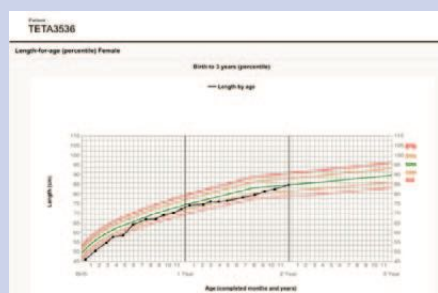
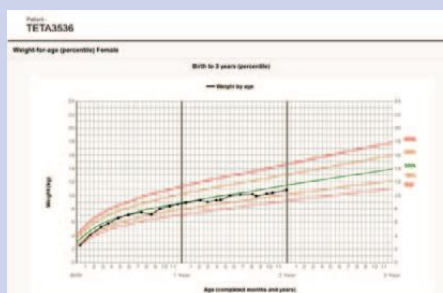
Accurate weight monitoring is critical to track progress and inform early action. The programme highlights the need for frequent, accurate weight monitoring to identify and address growth faltering early on, before an infant becomes wasted. In this programme, weight monitoring was successfully supported by the use of cloud-based software (in this case, Veracross) that plotted babies' growth on the World Health Organization growth chart and calculated their z-scores and percentile growth. This provided time efficiencies, avoided human error, and enabled the immediate, remote identification of growth faltering to support quick action. Active weight monitoring in early infancy was also supported by frequent home visits.

Technology can help support programming and monitoring. Technology was used to support one-to-one counselling and breastfeeding assessments and to collate data on complementary feeding, as well as for weight monitoring. This enabled understanding of common issues and trends and the adaptation of protocols in response. The use of online videos for mothers and the training of health workers also proved an extremely effective way of providing low-cost support to large numbers of individuals in a short space of time.

Training and supervision of the health workforce to support service quality is essential. Quality training and supervision of the health workforce, with referral mechanisms in place

## Case study 2

An infant baby girl was admitted at two weeks of age. She was underweight and severely stunted at time of admission. The mother received counselling on breastfeeding and complementary feeding from six months of age. The child's WHO weight-for-age (WFA) percentile chart demonstrates that her weight reached 50th percentile at around seven months of age and she had constant linear growth recovery, as seen in the second chart below, a length-for-age percentile chart, until two years of age.



## Box 2 Training topics covered in government health worker training

1. Breastfeeding skills and the science behind it (3 hours)
2. Type 1 & Type 2 nutrients and the first 1,000 Days (2 hours)
3. Pre-pregnancy and maternal nutrition to decrease low birth weight and pregnancy charts (1 hour)
4. Complementary foods (2 hours)
5. Growth charts/child growth tracker (2 hours)
6. Breast crawl and kangaroo mother care (2 hours)
7. Expressing, storing and feeding expressed breastmilk (2 hours)
8. Nipple and breastfeeding problems and physical methods to increase milk supply (2 hours)
9. Practical workshop

when children fail to respond, has been critical to the success of the FMCH programme, enabling consistency of messaging to mothers. The experience of training government health workers has shown that, with the use of online resources, training does not need to be costly and is possible within the existing health system in India.

### Next steps

There are encouraging signs that the FMCH programme has had a positive impact on the prevention of stunting and wasting among beneficiary children in a relatively short space of time through a combination of intensive weight monitoring and contextualised, targeted counselling of pregnant and lactating mothers and caregivers. The FMCH programme has been successfully replicated in rural settings in Shirampur, Maharashtra since 2013, as well as in the outskirts of Mumbai since 2017 through government integrated child development services in Anganwadi centres. This shows that there is potential to integrate the FMCH protocol into routine health services using existing personnel through a method of low-cost training based on free, online training resources. This type of intervention could assist the Government of India in achieving its wasting and stunting targets. FMCH is keen for more organisations and governments across the world to use the curriculum and methodology developed by the Spoken Tutorial team at the Indian Institute of Technology, Bombay and share resources and experiences.

For more information please contact Rupal Dalal at [dalal\\_rupal@yahoo.com](mailto:dalal_rupal@yahoo.com)

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Shobana Sivaraman

# Community management of acute malnutrition in Rajasthan, India

By Daya Krishna Mangal and Shobana Sivaraman



Daya Krishan Mangal is Professor and Dean of Research at the IIHMR University, Jaipur. Dr Mangal has a Doctorate in Medicine and is a fellow of the Indian Public Health Association. He has over 35 years' experience working in public health, predominantly for the Government of Rajasthan and the United Nations Population Fund (UNFPA) and teaching in medical colleges across Rajasthan.



Shobana Sivaraman is Senior Research Officer for IIHMR University, Jaipur. She is a public health researcher with several years' experience in planning, implementation, data and data analysis in nutrition, maternal and child health. She worked closely with the Government of Rajasthan, the Global Alliance for Improved Nutrition (GAIN) and the United Nations Children's Fund (UNICEF) in the POSHAN programme in Rajasthan and supported related evaluations and research papers.

GAIN, UNICEF and other development partners supported the Community Management of Acute Malnutrition (CMAM) approach in Rajasthan. The authors would like to acknowledge Dr Abner Elkan Daniel, Child Development and Nutrition specialist, UNICEF India and Deepti Gulati, Head of Programmes, GAIN India for providing insight and technical expertise during the implementation of the CMAM programme described here.

GAIN, UNICEF and other development partners supported the Community Management of Acute Malnutrition (CMAM) approach in Rajasthan. The authors would like to acknowledge Dr Abner Elkan Daniel, Child Development and Nutrition specialist, UNICEF India and Deepti Gulati, Head of Programmes, GAIN India for providing insight and technical expertise during the implementation of the CMAM programme described here.

## INDIA

**What we know:** Community-based management of acute malnutrition (CMAM) is recommended by the World Health Organization for the large-scale management of children with severe acute malnutrition.

**What this article adds:** The CMAM approach was implemented through the government health system in 20 districts of Rajasthan in 2018 under the POSHAN II strategy. All children aged 6-59 months (375,5330) were screened for acute malnutrition; 10,344 of whom were identified as having uncomplicated severe acute malnutrition (SAM) and enrolled for community-based treatment using locally produced energy-dense nutrition supplement (EDNS). An independent evaluation of a cohort of 1,322 enrolled children showed that after eight weeks, 42.4% were discharged as cured, 4.1% defaulted, 53.5% were not recovered and continued treatment. At 12 weeks, 66.9% were discharged as cured, 8.1% defaulted and 25% were not recovered and referred for inpatient treatment. No children died. A qualitative study demonstrated no significant differences in socio-demographic characteristics in the households of cured, defaulted and non-recovered SAM children; common to most were a history of medical complications, low birth weight, lack of appetite and maternal undernutrition. Results demonstrate that SAM children without complications can be managed successfully in the community in India through the existing health system using locally made EDNS. A cost-benefit analysis is needed to inform further scale-up and research is required to understand potential linkages between CMAM and existing programmes tackling the underlying causes of undernutrition in India.

### Background

#### Malnutrition in India

It is estimated that half of the world's wasted children (25.5 million out of 50.5 million children) live in India (Development Initiatives, 2018) and that malnutrition is the underlying cause of 68% of India's child deaths (Swaminathan et al., 2019). This is despite India's economic growth in recent years. Latest national estimates suggest that 38.4% of children under five years of age in India are stunted and 21% are wasted – much higher than the average across developing countries of 25% and 8.9% respectively (IIPS and ICF, 2017). Important drivers of child wasting in India are inadequate maternal nutrition, low birth weight (LBW) and poor infant and young child feeding. It is estimated that only 54.9% of infants in India are exclusively breastfed for six months, and only 9.6% of children aged 6-23 months receive an adequate diet (IIPS and ICF, 2017). The state of Rajasthan in the northwest of India has seen a substantial increase in wasting levels over the last two decades; from 11.7% in 1999 to 23% in 2016 (IIPS and ICF, 2017), with the prevalence of severe wasting standing at 8.7%. Given this, Rajasthan is a high-priority state for interventions to tackle this critical public health problem.

India's nutrition policy, developed in 1993, adopts a multi-sector approach to tackle the multiple causes of malnutrition under which numerous programmes and schemes have been developed and implemented at scale.<sup>1</sup> Most recently, POSHAN Abhiyaan (Proactive and Optimum care of

children through Social-Household Approach for Nutrition)<sup>2</sup> has been implemented by the Government of India (GoI). It is a multi-ministerial convergence mission to enable the integration of all nutrition-specific and nutrition-sensitive interventions with the vision of eliminating malnutrition in India by 2022 (de Wagt et al., 2019).

#### Treatment strategies to address severe acute malnutrition (SAM) in India

The growth of children under five years of age is monitored regularly by frontline health workers across India, including auxiliary nurse midwives (ANMs) posted at sub-centres and primary health centres and community-level Anganwadi workers (AWWs). Children identified as having moderate acute malnutrition (MAM) are provided with extra nutritional supplement packets through the national Supplementary Nutrition Programme (SNP). Those identified as having severe acute malnutrition (SAM) with or without medical complications are referred to the nearest malnutrition treatment centre (MTC) or nutrition rehabilitation centre (NRC) for medical care and nutrition therapy. The limitations of this system are the high cost of inpatient or facility-based management of SAM, low coverage, high opportunity

<sup>1</sup> Integrated Child Development Scheme (ICDS); Mid-Day Meal (MDM); National Health Mission (NHM); National Nutrition Mission (NNM); National Food Security Act (NFSA) 2013; Village Health Sanitation and Nutrition Committees (VHNSCs); Food Safety and Standard Authority of India (FSSAI); village health nutrition days (VHNDs); and malnutrition treatment centres (MTCs) or nutrition rehabilitation centres (NRCs).

<sup>2</sup> <http://nrhmrajasthan.nic.in/POSHAN.htm>

costs for families (in terms of travel, time away from work and household responsibilities) and lack of access to and acceptability of inpatient facilities in remote, rural populations. To address these limitations, steps have been made in India to test the utility of the World Health Organization (WHO)-recommended community management of acute malnutrition (CMAM) approach (WHO, 2013).

### CMAM in India

CMAM was initially introduced in India in 1999 by Médecins Sans Frontières as an emergency response in Braul block of Darbhanga district, Bihar, following the Kosi floods. The CMAM programme, encompassing inpatient treatment for complicated SAM and outpatient treatment for uncomplicated SAM, achieved a cure rate of 57.4%, defaulter rate of 36.2%<sup>3</sup> and a 0.8% mortality rate, demonstrating low mortality and high cure rates among non-defaulting children (Burza et al., 2015). In comparison, a 2013 study conducted in Madhya Pradesh (N=2,740) evaluated the model of 14 days compulsory inpatient treatment at an NRC for all identified SAM children, followed by treatment through the SNP under the national Integrated Child Development Scheme (ICDS) for 60 days. This programme achieved a cure rate of 43.9%, defaulter rate of 32%, non-recovery of 23.7% and a 0.4% mortality rate (Aguayo et al., 2013). Following this, development organisations have piloted CMAM in various states, including Maharashtra, Odisha, Jharkhand and Rajasthan.

In 2015 the Government of Rajasthan (GoR) National Health Mission (NHM) in partnership with the United Nations Children's Fund (UNICEF), Children's Investment Fund Foundation (CIFF), Global Alliance for Improved Nutrition (GAIN) and Action Against Hunger (ACF), implemented CMAM through the POSHAN strategy. The purpose was to treat SAM children with no medical complications in the community using the Medical Nutrition Therapy (MNT) Kit.<sup>4</sup> POSHAN I was implemented between 2015 and 2016 across 10 high-priority districts and three tribal districts of Rajasthan. Around 234,404 children aged 6-59 months<sup>5</sup> were screened and 9,640 children were identified as SAM and enrolled for treatment (according to criteria described in Table 1). Results showed that 88% of SAM children recovered after eight to 12 weeks of treatment

(GoR NHM, 2016). Based on these positive results, in November 2018 the CMAM approach (now called 'integrated management of acute malnutrition' (IMAM)) was scaled up under POSHAN II across 20 districts of Rajasthan, selected by the NHM Rajasthan due to their high burden of acute malnutrition.

### POSHAN II partnership and funding

For the implementation of POSHAN II, the GoR NHM again collaborated with UNICEF, CIFF, GAIN, ACF and Tata trusts. The GoR NHM was responsible for the funding and management of sub-centres<sup>6</sup> and other health facilities and human resources (district and state health officials and frontline health workers), and the development of state CMAM guidelines and protocols. UNICEF funded and facilitated the training of trainers and field-level training for frontline health workers and supplied equipment, including weighing scales, stadiometers/infantometers and mid-upper arm circumference (MUAC) tapes. GAIN (funded by CIFF) facilitated programme implementation, provided technical assistance and monitored the programme at the community level. GAIN also collaborated with the Indian Institute of Health Management Research (IIHMR), Jaipur to conduct an independent impact evaluation and identify the socio-cultural factors contributing to the success of POSHAN II. ACF (also funded by CIFF) was responsible for community mobilisation, advocacy, campaigning and media coverage. Tata trusts funded the procurement of energy-dense nutrition supplement (EDNS), made from locally available ingredients, from Indian companies Compact and Hexagon.

### POSHAN II implementation and outcomes

#### Screening and identification of SAM

In POSHAN II, CMAM services were provided through health sub-centres (known in the programme as 'POSHAN centres') at block level through auxiliary nurse midwives (ANMs) and accredited social health activists (ASHAs; known as 'POSHAN praharis') frontline health workers. ASHAs are paid workers, remunerated under an incentive-based scheme. Both ANMs and ASHAS received quality training, including in the taking of anthropometric measurements, to enhance implementation quality. As POSHAN

praharis were already present and engaged in their respective communities, no additional community mobilisation activities were undertaken to support this CMAM programme.

POSHAN praharis carried out the screening process through active case-finding. Visits were made to all households with children aged 6-59 months<sup>5</sup> to measure their MUAC. Children with MUAC <12.5 cm were taken to the nearest POSHAN centre for the ANM to measure the child's weight, height or length and MUAC. Children were also checked for bilateral pedal oedema and any medical complications. Later, the ANM, along with the mother or caregiver, conducted an appetite test for the child using energy-dense nutrition supplement (EDNS). If the child had bilateral pedal oedema and/or any medical complication and/or a failed appetite test, they were referred to the nearest malnutrition treatment centre (MTC), irrespective of anthropometric measurements. If the child's weight-for-height z-score (WHZ) was <-3 SD and/or MUAC <11.5 cm, the child was identified as having SAM. SAM children without medical complications and with adequate appetite were enrolled in POSHAN II for management. Children with MUAC between 11.5 and 12.4 cm and/or WHZ <-3 SD to <-2 SD were categorised as having moderate acute malnutrition (MAM) and referred to the nearest government Anganwadi centre (AWC) for treatment under the Integrated Child Development Scheme (ICDS) scheme and Supplementary Nutrition Programme (SNP). (Table 1).

#### Community management of SAM

All enrolled SAM children were given a dose of albendazole for deworming, amoxicillin (a broad-spectrum antibiotic) and a weekly supply of EDNS according to their weight. The mother/caregiver was advised to feed the child EDNS daily as per the prescribed dosage, along with regular home-based food. Children and their primary caregivers reported to their nearest POSHAN centre every Tuesday for an ANM to track their nutrition status (by measuring their weight, height and MUAC) and provide EDNS packets for the following week. At each visit, primary caregivers were counselled on the prevention of family sharing of EDNS packets, the continuation of breastfeeding for children ≤24 months, minimum meal frequency, handwashing practices and immunisations. Caregivers were

**Table 1** Admission and discharge criteria in POSHAN I and POSHAN II

Anthropometric measurement	Enrolment criteria	Discharge criteria
MUAC	<11.5 cm (11.5 cm to <12.5 cm referred to Anganwadi centre)	≥12.5 cm
WHZ	<-3 SD (-3SD to -2SD referred to Anganwadi Centre)	≥-2 SD
WHZ and MUAC	<-3 SD and < 11.5 cm (11.5 cm < 12.5 cm and -3SD to -2SD referred to Anganwadi centre)	≥-2 SD
Medical complications	<12.5 cm and/or ≤-2SD with medical complications or bilateral pitting oedema referred to MTC	

<sup>3</sup> Factors associated with the high defaulter rate in this programme were younger child age, distance from the programme, not being referred by health worker and seasonal trends.

<sup>4</sup> Medical Nutrition Therapy (MNT) kit consists of energy-dense nutritional supplement (EDNS), antibiotics and albendazole used for the treatment of SAM children in POSHAN-II.

<sup>5</sup> Infants under six months of age were not included in screening as they are screened during Village Health Sanitation and Nutrition Days conducted fortnightly in each village. If an infant under six months is identified as malnourished they are referred under current protocols to their closest primary health centre for consultation and treatment.

<sup>6</sup> In Indian rural health systems, a sub-center is the peripheral and first point of contact between the community and primary health centre system, serving a population of 5,000 in plains and 3,000 in hilly regions.



advised to seek medical care or reach out to an ASHA immediately if the child became unwell. POSHAN praharis paid daily household visits to enrolled children during the treatment phase to ensure regular consumption of EDNS and to further counsel the mother/caregiver on adequate dietary intake and hygiene practices. The number of SAM children in each village under the care of a single POSHAN prahari was usually around four or five.

Once an enrolled child reached the discharge criteria (Table 1) they were observed for one further week to check that the improvement was sustained; if no deterioration was observed, the child was categorised as cured and discharged from the programme. In the follow-up phase, POSHAN praharis made home visits to all cured children every 15 days for four months to track their nutritional status and dietary intake. Children who did not recover after 12 weeks of treatment were referred to their nearest MTC for further investigation.

### Programme outcomes

A total of 375,533 children aged 6-59 months were screened at home through house visits. Of these, 10,344 were identified as having uncomplicated SAM following further assessment and enrolled for treatment. After eight weeks of treatment, 43.1% children were discharged as cured, 10.6% defaulted, 46.3% had not recovered and continued treatment from nine to 12 weeks, and 0.1% died, demonstrating low default and death rates. The sex ratio of enrolled SAM children was 1,274 girls per 1,000 boys. The proportion of cured female children (44.8%) was higher than cured male children (40.8%). Mean weight gain of enrolled children after eight weeks was 3.2 g/kg/day, which is lower than international standards (Sphere, 2011) and some other programmes in India (Diop et al., 2003; Manary et al., 2004; Thakur et al., 2013), but higher than  $2.8 \pm 3.2$  g/kg/d as reported by Ciliberto et al., 2006. After 12 weeks, 70.2% of enrolled children were discharged as cured, 12.2% SAM children defaulted, while 17.2% were not cured and referred to MTC for further treatment and only SAM children 0.1% died.

## Independent impact evaluation of POSHAN II

### Methodology

The Indian Institute of Health Management Research (IIHMR) conducted an independent evaluation of POSHAN II using a quasi-experimental research study design between December 2018 and February 2019. A cohort of SAM children aged 6-59 months was sampled at baseline, midline and endline. The baseline study was conducted during the identification and enrolment of SAM children; midline and endline studies were conducted after eight weeks and 12 weeks of treatment. A sample-size calculation was car-

ried out<sup>7</sup> and children recruited accordingly from 70 POSHAN centres from five out of 20 programme districts. One district was selected at random from each of the five programme 'zones', reflecting different geographic, cultural and socioeconomic characteristics. A total of 1,322 SAM children were enrolled in the study (88.9% of target sample). The baseline study included 1,105 children (83.5% of enrolled children), the midline study covered 753 children (100% of target sample) and the endline study covered 1,091 children (82.5% of target sample). Ethical approval for the evaluation study was obtained from IIHMR University's Institutional Review Board.

### Findings

The majority (47%) of enrolled SAM children were aged 12-23 months; 21.3% were aged 24-35 months; 14.3% aged 6-11 months; 10.2% aged 36-47 months; and 7.4% aged 48-59 months. A total of 69.1% (764) children were enrolled in the POSHAN II programme with weight-for-height z-score (WHZ) < -3 SD; 16.2% (179) with both WHZ < -3 SD and MUAC < 11.5cm; and 14.7% with MUAC < 11.5cm. At eight weeks, 42.4% (319) children were cured; 4.1% (31) children defaulted, and 53.5% (403) children had not recovered and continued treatment. After 12 weeks, 66.9% (730) children recovered; 8.1% (88) had defaulted, and 25% (273) had not recovered. At 12 weeks, SAM children enrolled with MUAC had shown a higher cure rate (72.2%) compared to children enrolled with WHZ (68.8%), followed by children enrolled with MUAC and WHZ (54.2%). Cure rates achieved after 12 weeks of treatment were favourable compared with international standards and other similar Indian studies (Table 2). Underweight was not an admission criterion to the POSHAN II programme but, given increasing attention to WAZ as an indicator of risk, the underweight profile of admissions to the study is included here. Of enrolled children, 79.5% (878) were calculated to be severely underweight (< -3SD weight-for-age z-score (WAZ)), 17.1% moderately underweight (< -2SD WAZ) and 3.4% (38) were not underweight.

### Socio-cultural study of POSHAN II

A qualitative socio-cultural study was undertaken to understand the local context of SAM children and cultural practices at household level that may have influenced outcomes of the POSHAN

II programme. One programme block was targeted in each programme of the five studied districts during the post-treatment phase (after 12 weeks). In-depth interviews were conducted with 15 randomly selected mothers of cured, defaulted, and non-recovered SAM children. Focus group discussions (FGDs) with the same mothers were also conducted to understand differences of opinion. During in-depth interviews, the interviewer spent one whole day with the SAM child's family to understand household characteristics, socioeconomic status, availability of food, and cultural influence on food choices, eating habits and beliefs regarding food and nutrition. Data was collated and themes identified and analysed in detail.

Findings showed no significant differences in the socio-demographic characteristics of cured, non-recovered and defaulted SAM children. Non-recovered SAM children were found in families with a household earning of around Indian rupees (INR) 2,000 or less per month, as well as in families earning around INR 5,000 or more per month. Cured, non-recovered and defaulted SAM children were observed in families with a broad spectrum of socioeconomic status and tribal groups engaged in a range of occupations, including agricultural activity. No patterns were observed in the household food basket of families of cured, non-recovered and defaulted children. Most families of SAM children were vegetarians. Some families had a low or zero intake of green vegetables and fruits. In contrast, others had high dietary diversity, with food baskets that included roti, green vegetables (okra, bitter gourd, bottle gourd, tinda and spinach), vegetables (potatoes and pumpkin), pulses (*urad dal*, *moong dal*, *chana dal* and *masoor dal*), curd, buttermilk, milk in the form of tea and (occasionally) rice.

Irrespective of socio-demographic characteristics and type of food basket, all SAM children had a troubled medical history (for example, vomiting, lack of appetite, diarrhoea and fever) and/or low birth weight and lack of appetite from birth. Notably, some mothers of non-cured and defaulted SAM children reported extremely low levels of haemoglobin (as low as 5.5 g/dL) during pregnancy and a history of stillbirths and/or previous child deaths. Despite low haemoglobin levels and poor dietary intake, most of these mothers did not believe that they were

**Table 2** Comparison of POSHAN II outcomes with national and international standards (Sphere) (Aguayo et al., 2013; Burza et al., 2015; Sphere Project, 2011)

Indicators	POSHAN II	Indian studies	International standard (Sphere)	
			Acceptable	Alarming
1 Proportion of SAM children cured (%)	66.9	43 to 57	>75	<50
2 Proportion of SAM children defaulted (%)	8.1	32 to 38	<15	>15
3 Proportion of SAM children died (%)	0	0.4 to 1.1	<10	>25
4 Mean weight gain (gm/kg/day)	3.2	1.6 to 5.1	≥8	<8

<sup>7</sup> Assuming 8.7% prevalence of SAM in rural areas (NFHS-4) with ~60% and ~80% recovery rate (POSHAN 1) after eight and 12 weeks of treatment, risk ratio of 2.0, 95% Confidence Interval (CI), 80% power and 10% non-response rate, it was estimated that 750 and 1,486 SAM children will be required for midline and endline study.

undernourished during pregnancy and lactation and were not aware that their nutrition during pregnancy could impact on their child. The mothers also did not recognise the importance of birth spacing to protect the health of their offspring and themselves.

### Potential for the scale-up of CMAM in India

The first of its kind in India, POSHAN II is a CMAM programme implemented on a large scale to cover 10,344 SAM children across 20 districts of Rajasthan from November 2018 to June 2019. Programme outcomes suggest that SAM children without medical complications can be treated successfully using energy-dense nutrition supplement (EDNS) in the community. While the daily average weight gain was lower than international targets, we feel this reflects the Indian context and programme-based outcomes and could be improved through better counselling of mothers to help comply with feeding advice and supportive supervision during follow-up visits by accredited social health activists (ASHAs). The programme has been well integrated within existing health systems without the addition of a new cadre of health workers. In particular, the programme demonstrates the viability of linking CMAM programming with India's existing Integrated Child Development Scheme (ICDS) and Village Health Sanitation and Nutrition Day programmes for the screening, identification and treatment of SAM children in the community.

A significant challenge for scale-up will be the sustainability of funding, given the considerable expense of large-scale EDNS supplies. Based on the findings of the evaluation study, the Indian Institute of Health Management Research (IIHMR) recommends that the Government of Rajasthan (GoR) National Health Mission (NHM) should adopt the CMAM strategy in the medium term to address the high prevalence of SAM in the state of Rajasthan. IIHMR also recommends that an analysis of the CMAM strategy, underpinned by quality monitoring and evaluation, is undertaken to understand the cost-benefit of a government-funded CMAM

programme to address the issue of SAM in the long term. The success of a government-funded programme will depend on a robust management information system, training of the healthcare workforce, a recording and reporting mechanism, and significant resources and supply-chain management for EDNS.

Findings of the socio-cultural study suggest that LBW and poor maternal nutrition are important drivers of SAM that must be urgently tackled. More operational research is needed to identify possible linkages between the CMAM programme and other existing interventions to this end. The Maternal and Child Health Integrated Programme (MCHIP) is a landmark programme of the Government of India that adopts India's Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) strategy, aiming to provide comprehensive care at each key stage of the life course. Interventions of relevance under RMNCH+A strategy include the national iron+ initiative to address iron deficiency in adolescent girls; special newborn care units (SNCUs) where LBW infants receive treatment; close monitoring and follow-up of LBW babies by frontline workers; and an online tracking system for mothers and children. Collaboration with development partners such as UNICEF, CIFF, GAIN, ACF and Tata Trusts should also be explored by GoR NHM to support other interventions at critical stages of the life course to help prevent acute malnutrition.

National scale-up of CMAM is also recommended, based on the promising results from the Rajasthan experience. The central government can support this effort by promoting CMAM through the National Nutrition Mission (NNM) and releasing updated national CMAM guidance that is already in development. Once guidelines are in place, CMAM should be integrated into the training curriculum for medical professionals, nutritionists and frontline/community health workers. A capacity assessment of health and community-level systems is highly recommended to identify current capacity, access and barriers in the uptake of CMAM services in India.

### Conclusion

POSHAN II in Rajasthan is the first large-scale CMAM/integrated management of acute malnutrition (IMAM) programme in India to be implemented for the treatment of severely malnourished children in the community. A decentralised approach, dovetailed with the existing healthcare system, enabled the strengthening of the current systems and improved access to and coverage of treatment services to SAM children. An independent evaluation study of POSHAN II demonstrated a cure rate of 66.9%, which confirms the success of the CMAM approach in this context. The experience of POSHAN II also provides reassurance that locally produced energy-dense nutrition supplement (EDNS) is safe and acceptable and rapidly improves the nutritional status of severely malnourished children.

The socio-cultural study findings suggest that maternal undernutrition, maternal perceptions of undernutrition, LBW child health may be key drivers of SAM in the state. Findings indicate an urgent need for multiple strategies to address the causes of child undernutrition, including social behaviour change communication (SBCC) at the household level, interventions to support infant and young child feeding (IYCF), and strategies to support nutrition during adolescence, pre-pregnancy and pregnancy to help prevent LBW. Issues related to the social determinants of childhood undernutrition should also be addressed.

Overall, the CMAM programme was implemented successfully at scale in Rajasthan and deserves to be integrated within primary healthcare services in this state and beyond. Successful implementation was dependent on a high level of political commitment and collaboration with partner agencies to provide technical and (critically) financial assistance. Integration of CMAM into the national health system in India to support national scale-up will require long-term funding for EDNS and capacity-building and supportive supervision of health workers at each level.

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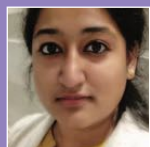


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Launch of the Supervised Supplementary Feeding Program (SSFP) by the state ministers of Telangana on 16th December 2019 at ICMR-National Institute of Nutrition, Hyderabad



## Development and use of alternative nutrient-dense foods for management of acute malnutrition in India

### INDIA

**What we know:** Ready-to-use therapeutic food (RUTF) is not sanctioned for use by the Government of India; therefore, alternative local products must be used in community-based management of acute malnutrition (CMAM) programming.

**What this article adds:** A review was undertaken of locally available energy and nutrient-dense foods used in the management of undernourished children in India. Suitability of the 42 food products identified was examined in terms of nutrient profile, palatability, safety, cost-effectiveness, shelf life and feasibility for scale-up of production. Results showed that there is potential to supplement several existing products with additional foods, multivitamins and mineral mixes to enable their use as therapeutic foods in the management of uncomplicated severe acute malnutrition (SAM) in the community. Based on these findings, an existing locally produced product (*Balamrutham*) was adapted (*Balamrutham+*) to provide improved energy, protein and nutrient density to enable its use in SAM treatment. To test *Balamrutham+*, the product was given to uncomplicated moderate and severe malnutrition cases in children under five years old admitted to a government supplementary feeding programme in a district in Telangana state. Follow-up was only possible for two weeks due to the COVID-19 pandemic. After two weeks of supplementation, 22.3% of children with moderate acute malnutrition (MAM) reached discharge criteria and 17.7% of severe acute malnutrition (SAM) children reached MAM criteria. Production of *Balamrutham+* has since been scaled up and is being used in treatment across Telangana state according to pre-existing plans as the food was found acceptable by the children in the community. COVID-19-related adaptations include use of mid-upper arm circumference (MUAC)-only protocols for treatment and a separate strategy for follow-up visits in designated containment zones for COVID.

### Introduction

There is increased motivation in India to develop national protocols for community-based management of acute malnutrition (CMAM) to address the unacceptably high and persistent levels of wasting in many states across the country. CMAM protocols are currently in development by the Government of India (GoI) in support of POSHAN Abhiyaan (the Government's new flagship programme to reduce all forms of undernutrition) to enable timely and appropriate management of children with uncomplicated severe acute malnutrition (SAM) in the community and more effective follow-up of compli-

cated SAM cases discharged from India's nutrition rehabilitation centres (NRCs). Fundamental to the CMAM approach is the availability of therapeutic food for use in the management of uncomplicated SAM cases in the community. While the World Health Organization (WHO) recommends the use of ready-to-use-therapeutic food (RUTF) for this purpose, RUTF has so far been restricted for use in India by the GoI due to its high cost and concerns that it may replace family foods and best practices for optimal nutrition and may not be acceptable at community level. Several state governments have explored the use of alternative, locally made, nutrient-dense





foods for the management of acute malnutrition, however, no national consensus has as yet been achieved on the most appropriate product to use in CMAM programming. The focus of this article is the development of an alternative nutrient-dense food by the Indian Council of Medical Research – National Institute of Nutrition (ICMR-NIN) and the National Centre of Excellence (NCoE) for the management of SAM for use in a supervised supplementary feeding programme (SSFP) in Telangana as an attempt to find a solution to this impasse.

### Review of locally available energy and nutrient-dense foods in India

The Indian Council of Medical Research – National Institute of Nutrition (ICMR-NIN) first carried out a review of all locally available energy and nutrient-dense foods used in the management of undernourished children in India to help inform the development of a product for use in the Telangana SSFP.

#### Methodology

Related research articles, guidelines, grey literature and available information were collated and reviewed. Information about each food product was gathered, including general information, nutrient composition, shelf life, cost and evidence of impact on the recovery of malnourished children. The nutrient value of each product was calculated using the recently revised Nutritive Value of Indian Food.<sup>1</sup> Based on their energy density, foods were classified as having high energy density (provides 450–550 kcal/100 g), medium energy density (provides 350–450 kcal/100 g) and low energy density (provides below 350 kcal/100 g). The suitability of foods for the management of children with severe acute malnutrition (SAM) was assessed according to energy and nutrient density, nutrient profile, palatability,

safety, cost-effectiveness, shelf life and feasibility of production scale-up for large-scale provision.

#### Results

Forty-two food items were identified, seven (17%) of which had high energy density, 14 (33%) medium density and 14 (33%) low density; no nutritional information was available for the remaining seven nutritional products. While most products met the protein requirements of 10–12% of energy, there were concerns about the quality of protein in some products and their protein digestibility-corrected amino acid score (PDCAAS).<sup>2</sup> There were also questions regarding the type of fats used and how this may influence cost and shelf life; for example, palm oil (used in some products) is cheaper and has a longer shelf life compared to other types of fat. Half (n=21) of the food products were enriched with micronutrients and one food item was fortified with spirulina. A total of 26 out of 42 (62%) products were ready to eat without preparation. The remaining products (38%) were in

the form of powder that required some cooking or the addition of warm water or milk before consumption (and therefore dependent on the quality of the milk or water added and cooking process). Information on shelf life of products was available for only eight (20%) of the products; for those with information available, shelf life (a key consideration for community use) varied between two to three and 180 days.<sup>3</sup>

#### Discussion

In spite of the limitations of the study, including missing information around cost, nutrient values and shelf life of some products, findings were useful in demonstrating the potential to adapt existing food products in India for use in the management of SAM children in the community. The review concluded that the quality of certain available food products could be supplemented; for example, with high-quality proteins (e.g., milk or egg protein) and multivitamin and mineral mixes, to more closely meet World Health Organization (WHO) standards for therapeutic

**Table 1** Activities of the Telangana state SSFP

Step		SAM	MAM
1	Anthropometric assessment (weight for length/height criteria and presence of bilateral pitting pedal oedema)	Yes	Yes
2	Medical assessment	Yes	No*
3	Appetite test	Yes	No
4	Decision on level of care required (SAM children with medical complications to be referred to health facility/NRC for further care and treatment)	Yes	No
5	Nutritional treatment (Balamrutham+ and food given to children with SAM and MAM as per schedule and consumption of energy-dense home foods encouraged)	Yes	Yes
6	Medicines administered	Yes	No
7	Nutrition and health education provided	Yes	Yes
8	Regular SSFP visit to Anganwadi centres to monitor the child's progress and provide Balamrutham+ based on the child's weight	Yes (weekly for first four weeks, then fortnightly)	Yes (fortnightly)
9	Discharge once criteria reached	After 16 weeks or WFL/WFH reaches -2SD for two consecutive visits	After 8 weeks or WFL/WFH reaches -2SD for two consecutive visits
10	Follow-up after discharge from SSFP until end of six months	Yes	Yes

\* All children are assessed for history of morbidity but only SAM children have a detailed medical assessment. If a MAM child is sick, he or she will be referred to nearest primary healthcare centre.

<sup>1</sup> Indian Food Composition Tables (IFCT) 2017 [www.ifct2017.com/frame.php?page=home](http://www.ifct2017.com/frame.php?page=home)

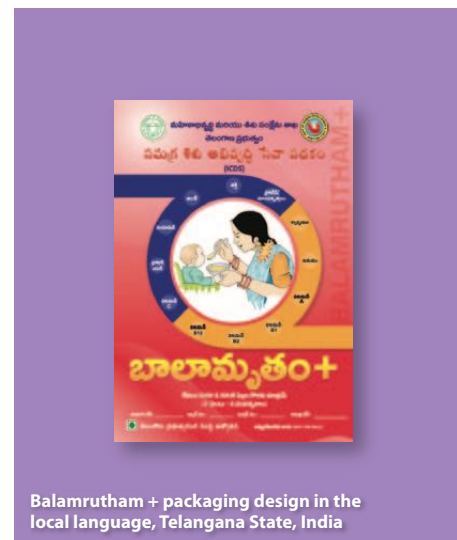
<sup>2</sup> While Codex recommendations note that protein quality should be measured by either the use of PDCAAS or DIAAS for the finished product, neither the PDCAAS nor the DIAAS values have been established for ready-to-use therapeutic food (RUTF) (FAO and WHO, 2018)

<sup>3</sup> Full results can be reviewed in the report downloadable from [www.nin.res.in/downloads/Mapping%20of%20Foods.pdf](http://www.nin.res.in/downloads/Mapping%20of%20Foods.pdf)



**Table 2** *Balamrutham plus (+)* nutrients and fortification for 100 grams of product

Nutrients	Available nutrients in natural ingredients per 100 grams	Fortification per 100 grams	Total per 100 grams
Energy (Kcal)	460	0	460
Protein (g)	11	0	11
Calcium (mg)	219	200	419
Iron (mg)	3.1	6.0	9.1
Vitamin A (mcg)	0.1	200.0	200.1
Vitamin B1 (mg)	0.2	0.3	0.5
Vitamin B2 (mg)	0.3	0.4	0.6
Vitamin B12 (mcg)	0.1	0.6	0.7
Vitamin C (g)	0.7	15.0	15.7
Folic acid (mcg)	21.1	15.0	36.1
Niacin (mg)	1.5	4.0	5.5
Zinc (mg)	1.3	5.0	6.3



Balamrutham + packaging design in the local language, Telangana State, India

feeding. Results were shared with state governments to support their exploration of alternative foods for the treatment of children with SAM at community level.

**Development of an alternative nutrient-dense food for use in a supervised supplementary feeding programme**

A SSFP was initiated by the Women and Child Department (WCD) of the Government of Telangana in December 2019 to tackle acute malnutrition in children aged 6-59 months in two rural districts (Asifabad and Gadwal) of the state, targeting over 6,000 children with acute malnutrition. In a joint collaboration by the Indian Council of Medical Research – National Institute of Nutrition (ICMR-NIN), Kalawati Saran Children’s Hospital (KSCH) and United Nations Children’s Fund (UNICEF) India Delhi and Hyderabad offices, a protocol for the SSFP was developed focusing on early identification of cases and community-based care for uncomplicated moderate acute malnutrition (MAM) and severe acute malnutrition (SAM). A full list of SSFP activities is described in Table 1.

**Product development**

ICMR-NIN worked closely with the Government of Telangana to develop a new nutrient-dense food that could be used in the SSFP for the community-based management of SAM and MAM cases. The aim was to develop a product

that would have the treatment advantages of RUTF (effective treatment for recovery), while being tailor-made to children in the India context and acceptable at community level, and which could be produced locally and therefore at lower cost.

Based on findings of the review of existing food-based products, a decision was made to adapt the widely accepted food product for Telangana state already used as the take-home ration (THR) for all children aged 6 to 36 months under the government Integrated Child Development Services (ICDS) programme Balamrutham (meaning “child elixir”). An improved version of this product, *Balamrutham+*, was developed to improve its energy, protein and nutrient density (Table 2. Compared to *Balamrutham* (still routinely given to all children as a THR except SAM and MAM children who are catered for under this programme), *Balamrutham+* has more skimmed milk powder (SMP), oil, added groundnuts and rice flakes to improve taste, and less wheat to reduce phytate content (Table 3). Rice flakes were used to reflect local

dietary patterns in Telangana to ensure product acceptability. *Balamrutham+* has lower milk protein compared to WHO therapeutic food recommendations; however, in the SSFP protocol, 200 ml milk and one egg per day are also provided to children with SAM which, together with the *Balamrutham+* ration, meets protein requirements. The micronutrient profile of *Balamrutham+* remained largely unchanged compared to *Balamrutham*, given that the original product already met Government of India (GoI) guidelines for THR and additional micronutrients, such as vitamin A and iron, are delivered separately through other blanket national nutritional programmes integrated into the SSFP. *Balamrutham+* is a powder that requires dissolving in equal amounts of lukewarm water to provide a paste; we see no disadvantage of adding water to *Balamrutham+* feeds, given that water must be given alongside all RUTFs, as long as the added water is procured from a safe source.

The product was finalised following an acceptability study of two possible recipes among MAM children and their mothers in the com-

**Table 3** *Balamrutham plus (+)* ingredients for 150 grams and 100 grams of product

Ingredient	Quantity (g)	Quantity for 100 g
Roasted wheat	40	26.7
Bengal gram	5	3.3
Skimmed milk powder	20	13.3
Sugar	30	20.0
Oil	30	20.0
Groundnut	5	3.3
Rice flakes	20	13.3
Total amount	150	100.0



Appetite test using *Balamrutham +* by Anganwadi Teacher of a SAM child at the Anganwadi Center in Gadwal district, Telangana State, India

**Table 4** Number of packets (given per week) and scoops per feed for MAM and SAM children

Weight of child (kg)	75 kcal/kg	2 feeds/day for MAM	125kcal/kg	4 feeds/day for SAM
Groups	Packets for week	Scoops per feed	Packets	Scoops per feed
4.0 - 4.4	1	1.0	1	1.0
4.5 - 4.9	1	1.0	1	1.5
5 - 5.4	1	1.0	1	1.5
5.5 - 5.9	1	1.5	2	1.5
6 - 6.4	1	1.5	2	1.5
6.5 - 6.9	1	1.5	2	1.5
7 - 7.4	1	1.5	2	2.0
7.5 - 7.9	1	1.5	2	2.0
8 - 8.4	1	1.5	2	2.0
9 - 9.4	2	2.0	2	2.5
9.5 - 9.9	2	2.0	2	2.5
10 - 10.4	2	2.0	2	2.5
10.5 - 10.9	2	2.0	2	2.5
11 - 11.4	2	2.0	3	2.5
11.5 - 11.9	2	2.5	3	3.0
>12	2	2.5	3	3.0

Note: This is for packets weighing one kilogram. For every one scoop of feed (30 g), one scoop of water is to be added.

munity. Both *Balamrutham* and *Balamrutham+* are developed by a state-owned subsidiary, Telangana foods, under the WCD of the Government of Telangana. The product is distributed in 1 kg packets with packaging designed by UNICEF, with clear pictorial guidelines on handling for community health workers and caregivers. It has a shelf life of three months. The cost of producing *Balamrutham+* is about 100 India Rupees per kilogram of final product (including the cost of packaging); twice that of the THR given to all children. However, this is much lower than commercially prepared food items due to the exclusive use of locally procured foods and government subsidies on the raw ingredients used, given the use of the product under social welfare schemes.

Feeds are given to children under five years old as per the SSFP dietary protocol of 75 kcal per kg of body weight of child for MAM and 125 kcal per kg body weight for SAM (dosed using 30 ml scoops). Feeds are given on site at Anganwadi centres for children older than 36 months and as a THR for those aged 6-35 months (as children in the younger age group do not attend Anganwadi centres). Dosage of *Balamrutham+* and frequency are described in Table 4.

### Programme outcomes

The original plan was to initiate the SSFP in both Gadwal and Asifabad districts from February 2020 (with full geographical coverage) and later scale up to 10 districts. However, manufacturing issues with *Balamrutham+* meant that SSFP was implemented in only one block (of the proposed four) in Gadwal district in March 2020. A total of 497 children were recruited to the programme, of which 153 (31%) were SAM and 344 (69%) MAM; 58.5% were boys. The target for the programme was set at a 50% recovery rate for SAM and MAM children combined

(using discharge criteria in Table 1), decided based on results of a study by Bhandhari et al (2016). The intention was to follow children up for the full duration of the programme to assess progress towards the target recovery rate and therefore feasibility of the use of *Balamrutham+* within this programme. However, data could only be collected for two weeks due to the impact of the COVID-19 pandemic. For MAM children, after two weeks of food supplementation, 22.3% reached the discharge criteria (weight-for-height (WFH) z-score  $-2$  SD or more). This was higher in younger children (6 to 35 months) compared to older children (over 36 months) (26.2% vs 18.2% recovery rate at the end of two weeks). As expected, recovery rates at the end of two weeks were lower for SAM children; 17.7% reached the criteria for MAM (WFH between  $-2$ SD and  $-3$ SD) and no SAM children met the discharge criteria. A higher proportion of younger SAM children aged 6-35 months met the MAM criteria compared to older children (over 36 months) (20.4% vs 11.4%).

### Adaptations and impact of COVID-19 on the SSFP programme and next steps

As a result of lockdown measures imposed due to the COVID-19 pandemic, Anganwadi Centres were initially closed which prevented access to growth monitoring and feeding services. Once re-opened, services resumed but with less regular follow up of admitted children and reduced programme monitoring. In response, SSFP protocols have been adapted, for example through adoption of mid-upper arm circumference (MUAC) for growth monitoring and admissions (using admission criteria MUAC  $<11.5$  cm for SAM and  $<12.5$  cm for MAM) and implementation of a separate strategy for follow-up visits in designated COVID-19 containment zones. For monitoring, mobile phone applications are

being used to enter data, with adaptations to allow for the collection of MUAC.

Subsequent to the pilot study, the SSFP was rolled out in all planned blocks in Gadwal and Asifabad districts according to original state plans, in spite of COVID-19 interruptions. Throughout August 2020, virtual capacity building was carried out for frontline workers of both districts to support COVID-19 related programme adaptations. Plans are being made to repeat the study in programme areas using MUAC-only criteria, with revised COVID-19 protocols and follow-up for the full length of stay. The manufacturing of *Balamrutham+* has now been scaled up to meet the needs of MAM and SAM children across Telangana state, and the government aims to fulfil its commitment by scaling up the SSFP across districts state-wide.

### Conclusion

The use of therapeutic foods for acute malnutrition has evolved over several decades, yet uncertainty remains in India concerning the best products to use in the community context. This is due both to a lack of consensus in the scientific community in India on the most effective product to use, and policy decisions taken by the Government of India (GoI), which can largely be attributed to a lack of convergence among the stakeholders concerned. The effort outlined in this article aims to bridge this gap in consensus by examining the benefits of adapting existing acceptable, affordable and therefore sustainable food products to meet the required standards for therapeutic feeding in the community in the context of a state-level SSFP. The experiences of using an adapted product in the SSFP were significantly compromised by the impact of the COVID-19 pandemic in the early stages, however, what data is available shows encouraging initial results. The programme has since been scaled up according to state government plans and adaptations are currently being made to ensure the continuation of the programme in the current context, which may help make this programme more resilient in emergency situations. The experiences described in this article can be used to inform other states in India in the future implementation of community management of acute malnutrition programming, based on the forthcoming GoI guidelines.

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## Adaptations to CMAM programming in Cox's Bazar in the context of the COVID-19 pandemic

By Tracy Dube, Mary Chelang'at Koech, Piyali Mustaphi, Sandra Harlass, Jessica Bourdaire and Karanveer Singh



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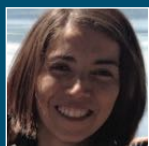
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Mother learning to use a MUAC tape, Cox's Bazar, Bangladesh, 2020

## BANGLADESH

**What we know:** The COVID-19 pandemic has had a widespread impact on nutrition programmes; wasting management programmes have had to adapt to ensure the continuation of services.

**What this article adds:** Wasting management services in Cox's Bazar Rohingya camps, coordinated by the Government of Bangladesh and the United Nations Children's Fund-led Nutrition Sector, have continued in the COVID-19 context with adaptations to reduce the risk of the transmission of the virus. Adaptations have included use of mid-upper arm circumference (MUAC) only for the screening, admission, follow up and discharge of children aged 6-59 months, the increasing of MUAC thresholds (to <120 mm for severe wasting and ≥120 mm and <135 mm for moderate wasting) to reduce the number of children missed for treatment, Mother-led MUAC for screening supported by camp volunteers, the integration of screening into the vitamin A supplementation campaign, the doubling of rations and reduced frequency of visits to Integrated Nutrition Facilities (INFs) to reduce contact, Infection Prevention Control (IPC) measures at INFs, the remote training and supervision of staff and volunteers and remote programme monitoring. The rapid implementation of adaptations was helped by the pre-existing coordination of stakeholders and emergency preparedness plans, strong communication between Nutrition Sector partners and INFs, a stock of ready-to-use therapeutic food (RUTF) supplies and the quick adoption of innovations. A challenge has been the large increase in caseload of moderately wasted children due to the increase in MUAC thresholds. This is being investigated.

### Background

Cox's Bazar is a coastal district in Bangladesh that is one of the most impoverished areas of the country. This district is also home to one of the world's most protracted refugee situations where, since the early 1990s, a Muslim minority group from Myanmar's northern Rakhine State, known as Rohingyas, have settled in camps and makeshift site settlements in the area. In August 2017, there was a major influx of 700,000 Rohingya people into Cox's Bazar, placing con-

siderable pressure on already scarce natural resources and livelihood opportunities. Today, Cox's Bazar's Ukhiya and Teknaf subdistricts hold more than 800,000 registered and unregistered Rohingya refugees in 34 demarcated camps.

The Nutrition Sector, operating under the Inter Sector Coordination Group (ISCG), is co-led by the Government of Bangladesh and United Nations Children's Fund (UNICEF). Nutrition Sector membership is comprised of implementing partners (non-governmental

organisations (NGOs) who work in partnership with and receive financial, logistical and technical support from various stakeholders including UNICEF, the World Food Programme (WFP) and the United Nations Children's Fund (UNHCR). The Nutrition Sector aims to ensure a well-coordinated and integrated nutrition response in Cox's Bazar that prevents and treats malnutrition in children under five years of age and related morbidities. Nutrition services are largely delivered through 45 integrated nutrition facilities (INF) (Box 1).

## Disruptions to nutrition programming as a result of the COVID-19 pandemic

The first COVID-19 case was recorded in Bangladesh in mid-March 2020 in Dhaka. By 16 August 2020, the number of COVID-19 patients passed 276,500 including 79 cases in the Rohingya camps. At this point, Bangladesh ranked 16th globally in terms of the total number of positive COVID-19 cases. A national taskforce, which includes the UN mission in Bangladesh, was set up in March to support the government's response to the pandemic with sub-committees at divisional and district levels. On 22 March, Bangladesh declared a 10-day shutdown effective from 26 March to 4 April which was extended and reviewed as the pandemic unfolded. To curb infections, and as part of the response plan agreed on by the taskforce and especially for Cox's Bazar, all flights and public transport to and from the district were stopped, hotels were closed and no tourists allowed and curfew and strict travel restrictions were put in place (including a 14-day quarantine for people coming from other parts of the country and restriction of travel into the camps). Measures were kept in place until the last week of July 2020 after which they were gradually relaxed.

The restrictions, which coincided with the start of the monsoon season (a period of increased risk of undernutrition), had a major impact on the continuation of nutrition programming in the camps. In particular, there were restrictions on the number of nutrition programming staff

entering camps (including those working in integrated nutrition facilities (INFs)) and the cessation of all community and group-based activities. Agencies were requested to classify all humanitarian work within the camps as either critical or non-critical. The UN agencies advocated with the Inter Sector Coordination Group (ISCG) and the Government of Bangladesh to ensure that curative nutrition services were classified as critical (including outpatient therapeutic programmes (OTPs), targeted supplementary feeding programmes (TSFPs), blanket supplementary feeding programmes (BSFPs), stabilisation centres (SC) and infant and young children feeding in emergencies (IYCF-E). Social and behaviour change communication (SBCC) activities, including nutrition education and community support groups, and growth monitoring activities were put on hold to reduce the risk of infection. While community-based management of acute malnutrition (CMAM) services were able to continue, several adjustments had to be made to ensure the safety of beneficiaries and staff and effective infection prevention control (IPC) within the INFs. These changes were guided by the guidance issued by UNICEF, Global Nutrition Cluster (GNC) and Global Technical Assistance Mechanism for Nutrition (GTAM) on 27 March 2020<sup>2</sup> and are described in this article.

## Adaptations made to CMAM programme in the COVID-19 context

### MUAC only programming

As part of COVID-19 preparedness activities, nutrition programmes were reviewed and evaluated to identify potential infection risk points. One potential risk factor identified was the diagnosis of acute malnutrition using weight-for-height z-scores (WHZ). With guidance from technical advisors of all three UN agencies at headquarter, regional and country levels, and in line with global recommendations,<sup>3</sup> the Nutrition Sector agreed to adopt MUAC-only plus oedema for the screening, admission, follow-up and dis-

charge of children aged 6-59 months in all CMAM programming within the camps. A local decision was made by Nutrition Sector partners to increase MUAC thresholds, influenced by the results of routine Cox's Bazar SMART survey results, which demonstrated poor concordance between MUAC and WHZ, with some children with a MUAC as high as 135 mm identified as acutely malnourished using WHZ. To ensure that no children were missed, final MUAC cut-offs were agreed to be <120 mm for OTPs<sup>3</sup> and ≥120 mm and <135 mm for TSFPs.

After an initial significant decrease in admissions to OTPs and TSFPs during March and April, admissions subsequently increased from May onwards (Figures 1 and 2). TSFP admissions were three times the level in June 2020 (9,347) compared to March 2020 (3,038 admissions). Discussions to review the cut-off points for moderate acute malnutrition (MAM) have since begun and will be concluded shortly to inform a decision on the appropriate MUAC cut-offs to be used for admission and discharge.

### Mother-led MUAC for screening

After COVID-19 containment measures (March-August) were put in place in the camps, there was a drastic reduction in CMAM screening of children aged 6-59 months especially from March to April. This was partly attributed to fear of transmission by mothers who, as a result, refused household access to community nutrition workers (CNWs) to conduct nutrition screening. This contributed to the decrease in number of admissions to OTPs and TSFPs during March and April. To increase the number of children being screened every month, the Nutrition Sector made the decision to build the capacity of mothers/caregivers (May/June) to use MUAC tapes to measure their own children independently. Mothers were trained on a one-to-one basis at the integrated nutrition facilities (INFs) by the Nutrition Sector staff. The UN agencies procured enough MUAC tapes to ensure that each mother had one for her household. Due to limited access to the camps by the nutrition staff residing outside the camps, Rohingya Nutrition Volunteers were recruited and deployed to train and support mothers to conduct Mother-led MUAC on a one-to-one basis.

### Supply issues and rations

In order to reduce the frequency of visits and crowding at the centres, rations of therapeutic and supplementary food were doubled and the frequency of visits halved (from weekly to bi-weekly for OTP and bi-weekly to monthly for TSFP). Given that weight measurements were not taken due to using MUAC-only, the ready-to-use therapeutic food (RUTF) ration size was modified so that, instead of issuing rations based on the child weight reference chart (as per national protocols), all severe acute malnutrition (SAM) children aged 6-23 months were issued with two sachets of RUTF and all SAM children aged 24-59 months were issued with three sachets of

## Box 1 Integrated nutrition facilities (INF) – progress in delivering continuity of care

Prior to 2020, nutrition services were delivered at 106 different sites across the Rohingya camps with little or no integration. In each camp, these nutrition services were supported by different United Nations (UN) agencies and implemented by different implementing partners (NGOs). This led to considerable overlaps, gaps and duplication of both services and target beneficiaries.<sup>1</sup> The Nutrition Sector undertook a rationalisation exercise in 2020 to address these challenges which resulted in reorganising nutrition services at 45 integrated nutrition facilities (INFs) across 34 camps.

INFs provide comprehensive nutrition services targeting children under five years and pregnant and lactating mothers. These include community-based management of acute malnutrition (CMAM) services (outpatient therapeutic programmes (OTPs) and targeted supplementary feeding programmes (TSFPs)), blanket supplementary feeding programmes (BSFPs), social and behaviour change communication (SBCC) on infant and young child feeding (IYCF) and maternal health and nutrition and other nutrition-sensitive programmes.

The management of children with severe acute malnutrition (SAM) is supported by UNICEF in 20 camps and

UNHCR in 14 camps. The World Food Programme (WFP) supports the management of children and pregnant and lactating women/girls (PLW/G) with moderate acute malnutrition (MAM) across all 34 camps. In the 20 camps where both UNICEF and WFP are supporting services, the same implementing partner is being used and the staff structure, salaries and layout of the centres have been jointly agreed to help to reduce the possibility of one person benefiting twice from the same service (e.g. by being admitted in two or more treatment sites). In the 14 camps where services are supported by UNHCR and WFP, implementing partners are engaged through a tripartite agreement based on a global memorandum of understanding (MOU) between UNHCR and WFP.

In the INFs, SAM children are treated to full anthropometric recovery (mid-upper arm circumference (MUAC) ≥125mm for two bi-weekly consecutive visits). The TSFP only treats children enrolled as MAM from the outset. Children with severe acute malnutrition (SAM) and medical complications are treated in five stabilisation centres (SC) within the camps. WFP and UNICEF also support nutrition programmes in the host population in the surrounding subdistricts.

<sup>1</sup> Read a previous *Field Exchange* article about this at <https://www.enonline.net/fex/62/myanmarnationalsin-bangladesh>

<sup>2</sup> <https://www.enonline.net/covid19wastingbrief>

<sup>3</sup> In line with 27th March 2020 guidance from UNICEF, GNC and GTAM <https://www.enonline.net/covid19wastingbrief>



RUTF per day for 14 days. To ensure no pipeline breaks of RUTF in the case of a sudden lockdown of the camps, every INF was provided with a two-month supply of RUTF.

There were no alterations in TSFP rations for children (one sachet of ready-to-use supplementary food (RUSF)/day). Double rations were also provided less frequently for pregnant and lactating women in both the TSFP and blanket supplementary feeding programme (BSFP) and vegetable oil was omitted to protect the ration from rancidity due to longer anticipated storage time before consumption. In June, a temporary break in the pipeline of Super Cereal led to substitution with Super Cereal plus.

To further decongest nutrition sites, BSFP distribution was shifted from the INFs to General Food Assistance (GFA) distribution points from June. Super Cereal is now being distributed to all households to provide extra nutrients to boost immunity. Now that most sectors are re-opening, discussions are currently underway about moving BSFP back to the INFs.

### Infection prevention and control (IPC) measures

Since the beginning of the pandemic, the Nutrition Sector has worked to improve infection prevention control (IPC) measures at INFs. Measures have included the installation of additional hand-washing points at the entrance of each nutrition centre, mandatory handwashing and temperature screening for children and caretakers on entry, the provision of basic personal protection equipment (PPE), including masks, to staff, ensuring hand hygiene after each beneficiary, regular disinfection of sites and equipment according to Nutrition Sector guidelines and ensuring physical distancing within the centres. In addition, the decision was made not to use biometrics for registration for OTP/TSFP (which prior to the pandemic have been used for camp registration and registration for food assistance) to minimise the risk of COVID-19.

The UN agencies unanimously approved activation of emergency preparedness budget lines in the partners' budgets for the procurement of necessary additional supplies to support IPC measures. Some supplies, such as infrared thermometers and MUAC tapes, were purchased centrally by UN agencies and distributed to partners and others were procured locally in Bangladesh by partners directly.

### Messaging

Social and behaviour change communication (SBCC) and growth monitoring activities were not identified as critical interventions, therefore they have been put on hold for the time being. Messaging on COVID-19 and changes to nutrition programmes have been broadcast using megaphones and radio as well as through written posters, word of mouth at INFs and General Food Assistance (GFA) sites and via tom-tom drivers recruited by the World Food Programme (WFP). Infant and young children feeding (IYCF) counselling is provided to mothers and caregivers on a one-to-one basis at the centres, respecting social distancing.

### Preparation for treating children with SAM and COVID-19

In addition to updating emergency preparedness documents, a Standard Operating Procedure (SOP) on programming during the COVID-19 response was developed. Three specialised COVID-19 treatment facilities called SARI ITC (severe acute respiratory infection isolation and inpatient treatment centres) equipped to function as stabilisation centres were established to treat children with SAM and COVID-19 as well as breastfeeding mothers with COVID-19 and elderly people with COVID-19 and SAM (MUAC <18.5 cm). Screening and referral pathways were also developed for suspected children/caregivers with COVID-19 from centres to the designated health facilities. To date, no cases of SAM with suspected COVID-19 have been transferred or treated within SARI ITCs.

### Integration with other nutrition services

Mass vitamin A supplementation campaigns for children have been modified in the context of the COVID-19 pandemic. A key modification has been the integration of mass screening of children for acute malnutrition within this campaign through the use of a separate MUAC tape for each child and IYCF messaging. The details of this experience are shared in a separate article in this edition of Field Exchange.<sup>4</sup>

### Remote training, supervision and monitoring

Training and support on COVID-19 prevention and CMAM programme adaptations are being provided to partners and staff through online training platforms (e.g., Zoom and Microsoft Teams). Pre-COVID-19, UNICEF had an agreement with CARE International to provide technical

support to implementing partners. During COVID-19, in the light of limitations on the number of staff entering the camps per agency, CARE International, who are not implementing any nutrition programmes, was tasked with the role of independent programme monitoring. Monitors from CARE pay regular visits to INFs supported by UNICEF and WFP and monitor remotely using mobile phones. Ongoing weekly calls are also made by UNICEF Emergency Nutrition Officers to each INF supervisor to collect information on the functioning of the INF, the staff present and the stock position. During these calls, information is collected randomly from two mothers present at the INF at the time of the call, including access to the INF, services being provided and access to, availability and cost of fresh food in the market.

### Outcomes so far

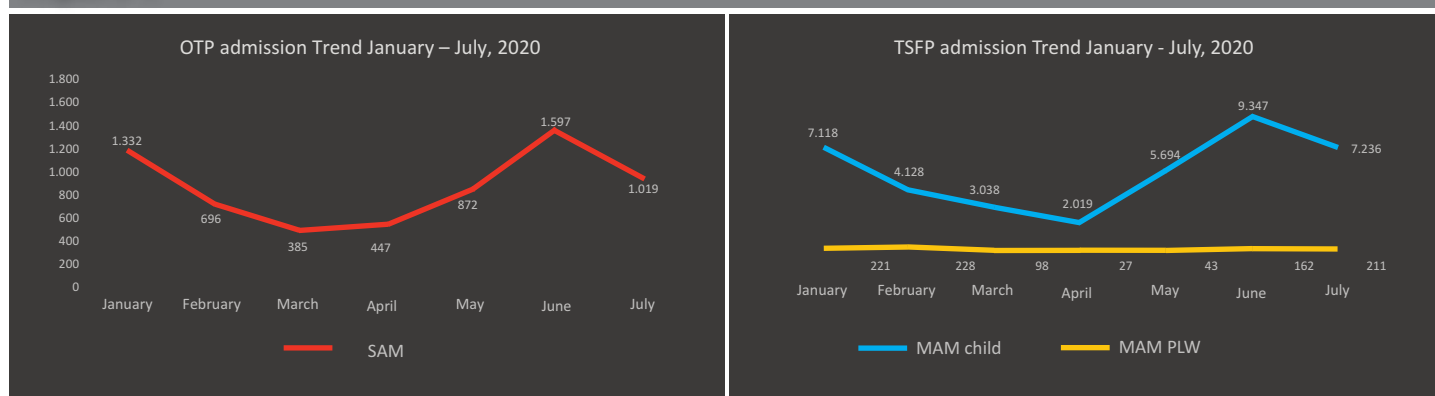
After an initial significant decrease in admissions to OTPs and TSFPs during March and April, a subsequent increase in admissions was observed (Figure 1) with TSFP admissions in June 2020 (9,347) three times higher than in March 2020 (3,038). A similar pattern was also seen for OTP admissions. As discussed above, the initial dip in admissions was likely due to lockdown measures and fear of transmission in accessing services. The subsequent rise in admissions coincides with the integration of acute malnutrition screening within the vitamin A supplementation campaign (June to July 2020) which enabled a high coverage of screening.<sup>5</sup> The increase in admissions from May onwards also coincides with the building of mother/caregiver capacity to take mid- upper arm circumference (MUAC) measurements at home; between April and July 2020, 3,669 children aged 6-59 months with a MUAC <135 mm were referred by the 82,921 mothers trained to use MUAC.

Programme outcomes for OTPs and TSFPs remained relatively stable over this period (Tables 1 and 2). It is not possible to compare 2020 outcomes with previous years given the difference in treatment sites (non-integrated sites previous to 2020) as well as the changes in admission and discharge criteria and MUAC cut-off thresholds in 2020.

<sup>4</sup> See article in this edition entitled "Integrating screening for acute malnutrition into the vitamin A supplementation campaign in the Rohingya camps in the context of COVID-19"

<sup>5</sup> See article in this edition entitled "Integrating screening for acute malnutrition into the vitamin A supplementation campaign in the Rohingya camps in the context of COVID-19"

**Figure 1** Trends in admissions to OTP and TSFP from January to July 2020



**Table 1** Programme outcomes for OTPs in Rohingya camps in Cox's Bazar April to July 2020

SAM 2020						
Month	Cured (%)	Defaulter (%)	Death (%)	Non-response (%)	Average length of stay (days)	Average weight gain (kg)
April	89.99%	0.57%	0.14%	9.30%	69.53	3.11
May	84.80%	0.19%	0.00%	15.01%	66.29	2.85
June	86.95%	0.25%	0.25%	12.56%	68.20	2.92
July	93.44%	0.11%	0.11%	6.34%	67.93	2.90

No cases of SAM with COVID-19 were admitted to severe acute respiratory infection isolation and inpatient treatment centres (SARI ITCs) which had a low overall bed occupancy. A total of 162 acutely malnourished children with suspected COVID-19 were referred from 27 UNICEF and WFP run integrated nutrition facilities (INFs) to health facilities but none of these tested positive. Around 185 mothers were asked questions via weekly mobile phone remote monitoring between June and mid-August. Of these mothers, 70% reported feeding less diverse food to their children, 53% reported feeding less food to their children and 45% reported food shortages within their households since the onset of the pandemic.

### Lessons learned

*Pre-existing coordination and collaboration between stakeholders and emergency preparedness plans prepared the way for the continuation of nutrition programming*

Preparedness is critical. The existing strong coordination and collaboration between the three UN agencies and solid Nutrition Sector leadership during the COVID-19 response enabled a quick response to the changing situation and the uninterrupted implementation of nutrition services over this period, albeit with adaptations. Prior to the outbreak of COVID-19, the Nutrition Sector had an emergency preparedness document in place that only required updating to the COVID-19 context, rather than writing from scratch. This guided the response. UN partnerships with non-governmental organisations (NGOs) had emergency lines embedded within their budgets and this helped a quick turnaround when the need to procure COVID-19 related resources arose. The need to have these emergency budget lines was adopted from prior experience in responding to the monsoon floods.

*Strong communication between integrated nutrition facilities (INFs) and the Nutrition Sector and ongoing monitoring enabled a quick response to challenges*

Continued communication and routine information exchange between the Nutrition Sector and INFs enabled the prompt development of contextualised technical guidance and targeted capacity building of partners, allowing nutrition programming to continue. Use of an independent monitoring agency (CARE International) to monitor the implementation of programme adaptations and infection prevention control (IPC) measures also helped to identify gaps for early corrections. Challenges observed by monitors related to difficulties switching to mid-upper arm circumference (MUAC)-only admission and the use of new MUAC cut-offs, the uptake of Mother-led MUAC, the fol-

low-up of supplementary and therapeutic food stocks both at beneficiary and at treatment site level, the implementation and maintenance of functional extra hand washing points at entry to the INFs and the respect of physical distancing. As a result of this information, it was possible to provide support and capacity building to INF staff to overcome the challenges. The use of online platforms was key in rapidly sensitising staff on protocols and disseminating information in a timely fashion. Monitoring information was also critical in tracking trends and anticipating the initial fall in admissions and to inform an effective response.

*Provision of adequate stock of supplies enabled implementation of critical adaptations*

The pre-positioning of adequate therapeutic and supplementary food stocks enabled programmers to increase the quantity of rations given to beneficiaries at each visit when the frequency of visits was reduced. The pre-positioning of stock has also been important to prepare for potential breaks in the supply chain in the case of sudden lockdowns.

*Raising MUAC thresholds has raised the level of admissions of children with MAM which has programming implications*

The MUAC cut-off point of <135 mm for referral to TSFP seemed too high, given the observed sharp increase in MAM caseloads. The situation was closely monitored and the MUAC cut-off point adjusted to <130 mm, from the 1 September 2020, following the anthropometric data analysis of 20% of children admitted in targeted supplementary feeding programmes (TSFP).

*The rapid application of programme innovations enabled services to continue*

It was important to consider all available opportunities to reach the community and embrace innovations. For example, the vitamin A supplementation campaign provided an opportunity for the screening of children for acute malnutrition and to communicate messages on infant and young child feeding (IYCF) focusing, for example, on violations of the Breastmilk Substitutes (BMS) Act. In addition, tom-tom drivers were used for social and behaviour change communication (SBCC). Other examples are the rapid recruitment and use of volunteers within the Rohingya community to support nutrition programming when staff were unable to enter the camps due to movement restrictions, the recruitment of an independent monitoring mechanism to identify gaps and the use of technology to enable remote communication with staff. These innovations were critical in enabling the continuation of nutrition services in the camps.

**Table 2** Programme outcomes for TSFPs in Rohingya camps in Cox's Bazar April to July 2020

MAM 2020						
Month	Cured (%)	Defaulter (%)	Death (%)	Non-response (%)	Average length of stay (days)	Average weight gain (kg)
April	91.69%	0.97%	0.22%	7.12%	74.99	1.85
May	84.09%	0.68%	0.00%	15.23%	86.27	1.61
June	76.12%	0.48%	0.10%	23.30%	101.22	1.59
July	85.18%	0.28%	0.23%	14.31%	95.39	1.82

### Conclusions

Programme adaptations remain in place at the time of writing. COVID-19 is present within the camps at a low level but the true situation is unknown due to limited testing. Although nutrition services are ongoing, the inability to implement all routine nutrition services has disadvantages. One example is the removal of the MUAC screening of children in blanket supplementary feeding programme (BSFP) services, since BSFPs were moved from the integrated nutrition facilities (INFs) to the General Food Assistance (GFA) platforms to minimise people gathering which may have delayed the detection of new cases of acute malnutrition. Therefore, adaptations are continually being reviewed and changed. Transition back to routine programming will depend on the local and national COVID-19 situation and Inter Sector Coordination Group (ISCG) directives and is expected to be undertaken systematically in a phased approach through engagement of each technical coordination platform.

Some of the programme adaptations will be continued post COVID-19. They include a family led MUAC approach as a form of active case finding for SAM and MAM alongside screening by community nutrition workers (CNVs) and staff at nutrition sites, the involvement of CNVs and caregivers in the promotion of engagement with nutrition services and the use of multiple platforms for social and behaviour change communication (SBCC). Another good lesson learned is the inclusion of emergency budget lines in partnership agreements even before the advent of the emergency which means that resources can readily be made available to implementing partners in times of crisis. These adaptations may be relevant in other contexts where CMAM is being implemented in the context of COVID-19, including in humanitarian contexts and in hard to reach areas.

The nutrition programme in the Rohingya refugee camps was able to quickly adapt to the rapidly changing, uncertain and extremely difficult programming situation as a result of the COVID-19 pandemic. This was largely due to strong technical leadership and the ownership, collaboration and coordination of Nutrition Sector partners who joined strengths and efforts and showed willingness to think 'outside the box' and learn and change with the evolving situation with one goal in mind – to reach every child and mother with quality life-saving nutrition services without any break.

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# Integrating screening for acute malnutrition into the vitamin A supplementation campaign in the Rohingya camps during the COVID-19 pandemic

By Bakhodir Rahimov, Karanveer Singh and Piyali Mustaphi



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The authors acknowledge the role that all Nutrition Sector partners have played in the work described in the article. In particular, they thank the office of the Refugee Relief and Repatriation Commissioner (RRRC) and the Civil Surgeon Office for their ongoing support. The authors also acknowledge the contribution of the Nutrition Section of UNICEF's office in Cox's Bazar which provided vitamin A supplements, designed the content of the integrated supplementation campaign and developed and distributed the communication materials. The United Nations High Commissioner for Refugees (UNHCR) and the World Food Programme (WFP) partners are also acknowledged for their contribution to the high coverage of the vitamin A supplementation round one in 2020.



Physical distancing at an integrated nutrition facility, Cox's Bazar, Bangladesh, 2020

## BANGLADESH

**What we know:** The COVID-19 pandemic has impacted on community screening and vaccination campaigns reducing the coverage of both.

**What this article adds:** A modified, integrated vitamin A supplementation (VAS) campaign was successfully carried out in Rohingya refugee camps using a door-to-door household strategy instead of traditional mass gatherings at nutrition facilities. Children with severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) were identified using modified Global Nutrition Cluster-recommended (GNC) mid-upper arm circumference (MUAC) cut-offs (SAM <120 mm; MAM ≥120 and <135 mm). The campaign reached 155,080 Rohingya children aged 6-59 months with vitamin A supplementation and MUAC screening (97% of the population in this age group), 7200 of whom were identified as acutely malnourished (SAM or MAM) with the greatest concentration of cases in children aged 6-23 months. Sector partners identified 132 children with disabilities who were referred to appropriate services. Key to the campaign's success was the recruitment of paid Community Nutrition Volunteers (CNVs) from the Rohingya communities and infection prevention and control measures (IPC) that reduced the risk of COVID-19 exposure.

### Context

Since the onset of the humanitarian crisis in Cox's Bazaar, Bangladesh in 2017, the Nutrition Sector has overseen the emergency nutrition response for both Rohingya and host communities. Approximately 270,000 children and pregnant and lactating women (PLW) in Rohingya refugee camps are regular beneficiaries of nutrition services. Since January 2020, nutrition services throughout the camps have been consolidated, shifting from 84 distinct outpatient therapeutic programmes (OTPs), therapeutic supplementary feeding programmes (TSFPs) and blanket supplementary feeding programmes (BSFPs) to a network of 46 integrated nutrition facilities (INF). The INF aim to offer a "one-stop-shop" approach where any wasted child can access services at the same

location, enabling continuity of care and efficiency of service delivery, and any mother/caregiver needing support for infant and young child feeding and care practices can access the services they need.

The COVID-19 outbreak has negatively affected service provision in both the Rohingya camps and host communities, including nutrition services. Following restrictions on movement put in place by the Government of Bangladesh from March 2020, there was a considerable reduction in the coverage of community nutrition services and outreach activities. Anthropometric measurements using weighing scales and height boards were discontinued and there was a slowdown in visits to INFs, reflected in a considerable fall in admissions to wasting treatment programmes. Com-

**Box 1** COVID-19 prevention measures introduced to the vitamin A campaign

- Recruitment of paid Community Nutrition Volunteers (CNVs) from the Rohingya population to support campaign efforts rather than deployment of service providers from outside the area
- Distribution of vitamin A supplements to children door-to-door instead of at fixed distribution sites to prevent large gatherings of children and caregivers
- Physical distancing during home visits between CNVs and household members
- Mandatory face mask usage by CNVs and household members
- CNVs encouraged to wear gloves and regularly disinfect their hands if it was not possible to avoid physical contact
- Provision of hand sanitisers to CNVs for proper hand hygiene
- Use of one mid-upper arm circumference (MUAC) tape per child to avoid the risk of transmission through multiple uses of a MUAC tape.

munity screening for acute malnutrition amongst the host community fell from 41,282 in January 2020 to a low of 1,414 in May 2020. In the Rohingya camps, nutrition screening coverage fell from 132,507 in January 2020 to 64,653 in April (Monthly 4W reports). As a result, the Nutrition Sector had to make urgent adaptations to existing programme approaches to allow the continuation of severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) treatment services.<sup>1</sup> One such adaptation was the integration of acute malnutrition screening into a modified vitamin A supplementation campaign conducted in the Rohingya camps between 21<sup>st</sup> June and 15<sup>th</sup> July 2020.

**Integrated vitamin A supplementation field strategy**

In response to an in-depth analysis of COVID-19 risk factors in the camps, the Nutrition Sector, in consultation with the sector's respective Technical Working Groups (TWG),<sup>2</sup> adopted global recommendations for adaptations to nutrition programming in the COVID-19 context. This included adaptations to the integrated vitamin A supplementation campaign round one (VAS R1) in 2020 (Box 1). The UNICEF Nutrition Section in Cox's Bazar led VAS R1 preparations, facilitated implementation and generated the final reports. Field implementation was supported by all TGW members.<sup>2</sup>

Sector partners agreed to extend the duration of the campaign to a maximum of four weeks due to the limited number of field staff available and to allow extra time for household visits (with some variation on duration within each camp). The campaign involved the distribution of vitamin A supplements to children, the measurement of each child's mid-upper arm circumference (MUAC) with demonstrations to mothers/caregivers on how to use a MUAC tape (Mother-led MUAC), identification of children with disabilities and messaging on infant and young child feeding (IYCF) to pregnant women and mothers with children under two years of age. The purpose of integrating these services was to enable the continuation of these critical nutrition services in spite of restrictions on movement. Integrated training modules were used by Community Nutrition Volunteers (CNVs) to support this including one on the applied Mother-led MUAC (Family MUAC) approach and another on IYCF messaging to promote optimal maternal nutrition, breastfeeding and complementary feeding practices, including avoidance of breast milk substitute usage. Over 200,000 MUAC tapes were printed locally to enable each family to have their own tape to support the implementation of Mother-led MUAC.

Any child diagnosed with either SAM or MAM according to adapted Global Nutrition Cluster (GNC) recommended MUAC cut-offs (SAM, MUAC <120 mm; MAM, MUAC ≥ 120 and <135 mm) (GNC, 2020) was referred to the nearest integrated nutrition facility (INF) for treatment services. Children with disabilities were identified using a simple questionnaire carried out with the caregiver, the purpose of which was to screen and refer children for a more detailed assessment. The questionnaire was based on 'Guidance on strengthening disability inclusion in Humanitarian Response Plans' (DFID, 2019), the simplified Washington Criteria and other recommendations of disability screening. Technical support was given by the disability specialist of the World Food Programme (WFP) and protection specialists of UNICEF Cox's Bazar and included asking the mother about any child disability-related concerns. Children identified with disabilities were referred to available disability services (for example, services provided by Handicap International).

Over 800 CNVs were mobilised for the vitamin A supplementation campaign, recruited by UNICEF, UNHCR and WFP programme partners and paid at pre-agreed, standardised rates

**Box 2** Procedures taken by CNVs during the door-to-door vitamin A campaign

- CNVs introduce themselves to the household, explain about the vitamin A supplementation campaign and obtain informed consent to enter the home.
- CNVs identify all children under five years of age in the household and determine the age-specific dose of vitamin A for each child and administer the dose.
- CNVs guide and supervise the mother/caregiver to take the mid-upper arm circumference (MUAC) measurements of each child under five years of age.
- CNVs guide and supervise the mother/caregiver to check for other signs of child malnutrition such as bilateral oedema.
- CNVs observe the child for any signs of physical disability and ask the mother/caregiver about any known disabilities, including mental disabilities.
- CNVs register all obtained data.
- CNVs explain the next steps to the mother/caregiver if MUAC measurements and/or checks for other signs of malnutrition indicate moderate acute malnutrition (MAM) or severe acute malnutrition (SAM).
- CNVs deliver age-appropriate infant and young child feeding (IYCF) messages on the optimal infant, child and maternal feeding.
- CNVs thank the mother/caregiver.

determined by the Refugee Relief and Repatriation Commissioner (RRRC) and the Inter Sector Coordination Group (ISCG). All CNVs had adequate literacy skills to complete registration documentation and some experience of supporting humanitarian work in the camps. CNVs were given intensive training using materials adapted to suit the COVID-19 context. This included the remote training of trainers using an online communication platform. Training was then cascaded to Rohingya CNVs in small face-to-face groups with physical distancing between the participants.

The procedures followed during the campaign are set out in Box 2. All Rohingya VAS CNV teams received supplies of vitamin A supplements, MUAC tapes, pamphlets with IYCF messages for caregivers, data registration sheets, masks, gloves and hand sanitisers. COVID-19 preventive behaviours were emphasised to the CNVs throughout the training including the regular use of hand sanitiser, the wearing of masks and ensuring physical distancing. CNVs were not routinely tested for COVID-19 but any CNV who experienced related symptoms was required to report to a health sector facility and self-isolate.

If any COVID-19 case was reported during the VAS campaign in a camp's block then the entire block was placed under quarantine.

**Table 1** SAM, MAM and GAM identified by age in the VAS R1 2020

Age group in month	The number of screened children under five	The number of SAM children	The number of MAM children	The number of GAM children	SAM prevalence by age group	MAM prevalence by age group
06-11	15,316	909	3,588	4,497	5.93%	23.43%
12-23	31,585	1,236	8,063	9,299	3.91%	25.53%
24-59	108,318	431	7,262	7,693	0.40%	6.70%
Total	155,219	2,576	18,913	21,489	3.42%	18.55%
Total prevalence		1.66%	12.18%	13.84%		

<sup>1</sup> For more information see field article in this edition entitled "Adaptations to CMAM programming in Cox's Bazar in the context of the COVID-19 pandemic"

<sup>2</sup> TWGs comprise of representatives of United Nations (UN) (UNHCR, UNICEF, WFP) and non-UN (Action Against Hunger, Care International, Concern Worldwide, World Concern, Save the Children International, Social Assistance and Rehabilitation for the Physically Vulnerable (SARPV), Society for Health Extension and Development (SHED), World Vision International (WVI))





A child at a therapeutic feeding centre, Cox's Bazar, Bangladesh, 2020

Bangladeshi national staff arriving from outside of the camps were checked for signs and symptoms of COVID-19 before being granted permission to enter the territory of the camp; if symptoms were present, they were reported and the individual self-isolated and took a COVID-19 test. These measures were essential to minimise the risk of COVID-19 transmission during the campaign.

Every evening, teams submitted daily reports to their respective agencies. The Nutrition Sector and UNICEF's information management officers subsequently compiled the data and analysed it against vitamin A supplementation coverage targets.

## Outcomes

A total of 155,219 children (97%) of the target 160,026 children aged 6-59 months were reached during the four-week vitamin A supplementation campaign. All these children received the integrated package of interventions (vitamin A supplement, screening for acute malnutrition and age appropriate IYCF messaging). According to the field monitoring reports from CARE International (the technical partner of UNICEF), there was a high acceptance of the vitamin A supplementation campaign among caregivers of children under five years of age.

Using the adapted MUAC thresholds, the overall average prevalence of SAM and MAM amongst screened children by age group is presented in Table 1. The total prevalence of SAM and MAM among children aged under five years was 1.66% and 12.18% respectively; global acute malnutrition (GAM) was 13.84%. The SAM prevalence analysis by age group found that children aged 6-11 months (5.93%) and 12-23 months (3.91%) had the highest prevalence of GAM; results show that these age groups were more susceptible to acute malnutrition than children aged 24-59 months of age. Additionally, 132 children aged under five years of age were identified with various disabilities during the campaign, with more children in the 6-11 month age group with disabilities compared to older age groups. This may be due to the presence of more congenital forms of disability in the younger age group.

The nutrition status of these disabled children is unknown but does warrant further analysis given they are a key risk group for malnutrition.

## Discussion

The screening of children aged 6-59 months of age with MUAC, integrated within the vitamin A supplementation campaign enabled the identification of almost 21,489 children with SAM and MAM using adjusted MUAC thresholds (MUAC <120 mm and <135 mm respectively). This experience demonstrates that vitamin A supplementation campaigns provide a 'natural fit' for community nutrition services which could be considered in the future.

The finding that SAM and MAM are most prevalent in children aged 6-23 months reconfirms that early childhood is a vulnerable period for children in the Rohingya camps. Ensuring children and their caregivers have access to services to prevent wasting is crucial, including maternal nutrition services to prevent low birth weight and anaemia and support for infant and young child feeding.

The number of cases of COVID-19 infection reported by the Health Sector did not increase following the vitamin A supplementation campaign which suggests that, although many factors are involved, it may be possible to safely implement further rounds during the COVID-19 pandemic using the adapted strategies and implementing infection prevention and control (IPC) measures. Lessons learned during the integrated vitamin A supplementation campaign will be applied for the next round of the campaign, scheduled to begin in November/December 2020.

The sector partners understand that COVID-19-modified GNC – recommended MUAC cut-offs increased nutrition referral rates with particular impact on therapeutic supplementary feeding programmes (TSFPs).<sup>3</sup> This situation is being monitored closely and decisions will be made to ensure continued high coverage of essential nutrition services.

## Conclusion

The experiences highlighted in Cox's Bazaar

have shown that it is possible to conduct a vitamin A supplementation campaign safely and successfully during the COVID-19 outbreak by using modified approaches, including shifting to door-to-door visits instead of mass gatherings. The recruitment and use of locally hired Community Nutrition Volunteers (CNVs) from the Rohingya communities (rather than the typically used Bangladeshi CNVs) to carry out the campaign reduced the risk of importing COVID-19 infection from outside the camps. By August 2020, screening amongst the host community reached 55,560 children and in the Rohingya camps, 169,997 children, exceeding pre-COVID coverage levels (Monthly 4W reports). The fact that the campaign reached over 97% per cent of children aged 6-59 months shows that, despite containment measures, large numbers of children can be reached through a well-planned and well-implemented approach.

The experience also shows that screening for acute malnutrition can be successfully combined with vitamin A supplementation, given that the target age group is the same. SAM and MAM children identified during the vitamin A supplementation campaign were successfully referred to the relevant nutrition programme (outpatient therapeutic programmes, therapeutic supplementary feeding programmes) as part of the integrated nutrition programme. The implications of the adapted MUAC thresholds, however, had caseload implications that are undergoing further analysis and review by the Nutrition Sector as part of the COVID-19 response strategy. Disabled children were referred to relevant services for children with special needs reflecting the potential for, and the benefits of, linking nutrition with allied programmes and sectors. Finally, the results of the screening highlight the vulnerability of the population to acute malnutrition and the need to improve maternal nutrition, support safe and appropriate breastfeeding and complementary feeding to prevent wasting in infants and young children.

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<sup>3</sup> Read more about this in a field article in this issue entitled "Adaptations to CMAM programming in Cox's Bazar in the context of the COVID-19 pandemic" and a research article entitled "Concordance between weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC) for the detection of wasting among children in Bangladesh"

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# Delivery of maternal nutrition interventions at scale and mainstreaming into the health system in Bangladesh



Frontline worker demonstrating dietary diversity to a pregnant woman and her husband, Bangladesh, 2017

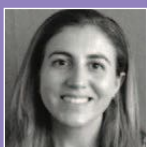
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The Alive & Thrive initiative, managed by FHI Solutions, is currently funded by the Bill & Melinda Gates Foundation, Irish Aid, the Tanoto Foundation, United Nations Children's Fund (UNICEF) and the World Bank.

## BANGLADESH

**What we know:** Maternal nutrition is a significant public health concern in Bangladesh that can lead to small-for-gestational age and pre-term newborns thus perpetuating the intergenerational cycle of malnutrition.

**What this article adds:** Alive & Thrive (A&T) carried out implementation research between 2015 and 2016 on the integration of maternal nutrition into existing large-scale programme platforms in Bangladesh. Results demonstrated significant impacts on the coverage of maternal nutrition services, maternal dietary diversity, the number of iron folic acid (IFA) and calcium supplements consumed and exclusive breast-feeding rates in just one year. Effects were likely due to a carefully designed, context-specific package of maternal nutrition interventions, the high quality and coverage of programme delivery and strong stakeholder engagement. Ongoing A&T technical assistance has helped mainstream maternal nutrition in key Government of Bangladesh (GoB) priority areas. This involved inclusion of maternal nutrition interventions in national strategies and programme guidelines, the development of national capacity building materials and supervision tools, the development of health service delivery standard operation procedures and counselling tools and integration with health information systems and social protection programming. Challenges to integration across nutrition-specific and nutrition-sensitive programmes include high staff workload and staff turnover and data gaps in routine monitoring systems.

### Background

#### Maternal and child undernutrition in Bangladesh

In Bangladesh, while women's nutrition has improved significantly over the past decade, undernutrition in this group remains high. Among ever-married adolescents and women aged 15 to 49 years, 19% are underweight (body mass index (BMI) <18.5 kg/m<sup>2</sup>), a decrease from 34% in 2004 (Black et al, 2013). Nearly one in two women of reproductive age (15 to 49 years) are anaemic (42%) and one quarter of

non-pregnant non-lactating Bangladeshi women are calcium deficient – a risk factor for pre-eclampsia (currently the second leading cause of maternal death, globally responsible for 19% of total deaths) (Government of Bangladesh, 2015; Black et al, 2013). Diet quality is a challenge in Bangladesh; the mean dietary diversity score for women aged 10 to 49 years was 4.1 in 2015, a decrease from 4.4 in 2014 (JPG, 2016). The coverage of antenatal care (ANC) services has steadily improved in Bangladesh but still falls short with



only 47% of pregnant women completing four or more ANC visits during pregnancy in 2017 (an increase from 31% in 2014) indicating that Bangladeshi women are missing opportunities for maternal nutrition services such as nutrition counselling, weight monitoring and micronutrient supplementation.

Inadequate maternal nutrition has consequences for both mothers and infants. Poor maternal nutrition, including anaemia and calcium deficiency, puts women at risk of preventable death and complications during pregnancy and delivery. Poor maternal nutrition also has implications for the growth and development of women's infants. Undernourished mothers are at a higher risk of giving birth to low birth weight (LBW) babies, a key risk factor for wasting in infancy and childhood and non-communicable diseases and short stature in later life. The rate of LBW in Bangladesh is high at 27.8% (UNICEF and WHO, 2019). Maternal micronutrient deficiencies also increase the risk of birth defects and cognitive impairments. Infant feeding practices are another key determinant of early undernutrition.

### Maternal nutrition programming in Bangladesh

The first major vertical nutrition programme to be implemented in Bangladesh was the government-led Bangladesh Integrated Nutrition Program (BINP) which operated between 1996 and 2002. Community-based nutrition activities were a core component of the BINP, implemented through partner non-governmental organisations (NGOs). Although the BINP ended in 2002, the same activities were continued until 2011 under the government-led, NGO-implemented National Nutrition Project (NNP). The community-based maternal nutrition component of BINP and NNP focused primarily on pregnancy weight monitoring, nutrition education, iron and folic acid (IFA) supplementation and food supplementation.<sup>1</sup> The BINP covered 61 sub-districts known as upazilas (approximately 16% of the rural population); the NNP then scaled up to cover 110 out of 492 upazilas (nearly one quarter of the population). Despite various successes and positive outcomes, the BINP and NNP faced programmatic challenges in terms of cost effectiveness for services delivered and low impact on project targets for reducing low birth weight and stunting (White et al, 2005).

In consideration of the importance of an integrated approach to achieve better nutrition outcomes, the vertical approach (NNP) was closed down in 2011 and, instead, nutrition

services were mainstreamed through the government health service delivery platform. This was implemented under the Health, Population and Nutrition Sector Development Program (HPNSDP) from July 2011- June 2016 and was guided by the National Nutrition Services Operational Plan (NNS OP).

### Integration of maternal nutrition into Alive & Thrive/BRAC Health, Nutrition and Population Program (HNPP)

In 2014, Alive & Thrive set out to address the dearth of experience or evidence of addressing maternal nutrition in a comprehensive manner by testing the feasibility of integrating a package of maternal nutrition interventions into the maternal, newborn and child health (MNCH) programme of BRAC's large-scale Health, Nutrition and Population Program (HNPP) in Bangladesh.<sup>2</sup>

A&T designed a package of maternal nutrition interventions that included iron and folic acid (IFA) supplementation, calcium supplementation, promotion of a varied diet, counselling on improved protein and energy intake, the monthly weight gain tracking of pregnant women and the promotion of early initiation and exclusive breast-feeding. A&T's interventions took place through BRAC's health and community services and focused on reaching pregnant women, postpartum mothers and individuals who influence women's nutrition-related decisions including family members, community influencers and health care providers. Interventions were delivered through home-based counselling, coaching and demonstrations by BRAC workers on dietary diversity and appropriate food quantity during

pregnancy and lactation, regular antenatal care (ANC) visits for the provision of free IFA and calcium tablets and measurement of weight gain and community mobilisation platforms including 'husband forums' that aimed to shift social norms on pregnancy and gender.

The package was delivered in 10 'intensive' (intervention) upazilas with 10 'non-intensive' (comparison) upazilas serving as the control. Mothers in the intensive group received BRAC's standard MNCH programme and A&T's intensified package of maternal nutrition interventions while the non-intensive group received only BRAC's standard MNCH program (Table 1). A baseline survey was conducted between July and August 2015 followed one year later by an endline survey between July and August 2016 in both the A&T intensive and comparison areas with the International Food Policy Research Institute (IFPRI) as the evaluation partner. Results showed that the intervention had a significant positive impact on the consumption of IFA and calcium tablets, on maternal dietary intake (dietary diversity and micronutrient intake) and on exclusive breast-feeding but not on initiation of breast-feeding.<sup>3</sup>

### Lessons learned

Published results demonstrate that integrating maternal nutrition into large-scale maternal, newborn and child health (MNCH) services is feasible and effective. Our approach yielded numerous lessons learned for programmers and policymakers about how to change maternal nutrition behaviors and improve the quality of service delivery.<sup>5</sup> Key lessons learned are described in Box 1.

**Table 1** Intensive and non-intensive interventions

Indicator	Indicator Intensive (intervention) upazilas	Non-intensive (comparison) upazilas
Counselling on diet diversity and quantity	Improved counselling with emphasis on coaching and demonstration	Routine nutrition education messages during antenatal care (ANC) contacts
Iron folic acid (IFA) and calcium supplements	Provision of free IFA and calcium tablets and emphasis on compliance during home visits by Shastho Kormi (SK) (salaried frontline workers)	IFA/calcium tablets sold by Shastho Shebika (SS) (volunteer frontline workers) or provided for free by the government
Weight measurement	Measurement and documentation of weight gain (or loss) of women every month by SK	None
Counselling on early breast-feeding and exclusive breast-feeding	More frequent counselling, supervision and monitoring and problem-solving	Routine messages in third trimester
Social mobilisation	Husband forums held in second and third trimesters and interactive media events	None
Number of visits during pregnancy and postpartum	SK: 7 visits during pregnancy, 5 visits during postpartum SS: 14 visits during pregnancy, 10 visits during postpartum	SK: 7 visits during pregnancy, 5 visits during postpartum SS: 7 visits during pregnancy, 0 visits during postpartum
Incentive structure	Added monetary incentives for SS workers who effectively achieved the following measures (in addition to activities under the standard incentive structure): <sup>4</sup> - SS visits twice per month - Pregnant woman/recently delivered woman eats food from at least five food groups - Pregnant woman takes 30 IFA/30 calcium tablets - SS helps SK to record weight of all pregnant women	Identification of pregnant women Ensure early initiation of breast-feeding

<sup>1</sup> During 2004 and 2011, NNP was implemented without food supplementation.

<sup>2</sup> BRAC is an international development organisation based in Bangladesh <http://www.brac.net/>

<sup>3</sup> Findings described in research snapshot in this edition entitled "Integrating nutrition interventions into an existing maternal, neonatal and child health programme in Bangladesh"

<sup>4</sup> If all additional criteria were achieved, SS workers received \$1.30/month

<sup>5</sup> Alive & Thrive. 2017. Implementation Manual: Community-based Maternal Nutrition Program, Bangladesh. Dhaka, Bangladesh: Alive & Thrive.

## Box 1 Key lessons learned from the Alive & Thrive/BRAC maternal nutrition initiative

1. Behaviour Change (SBC) interventions can impact maternal nutrition behaviors within a relatively short period of time.
2. The focus for SBC interventions should be the prioritisation of key behaviours and on small doable actions that pregnant women and influencers can take.
3. The use of multiple platforms and high intensity of exposure through different channels helps to reinforce key messages and change behaviours.
4. Supportive supervision is essential to boost the knowledge and performance of health providers, especially their counselling skills.
5. SBC approaches need to target pregnant women and the secondary audiences who influence them, e.g. husbands, mothers-in-law, community elders and health workers.
6. Quality of SBC messages is as important as the quantity of messages (Nguyen et al, 2018).
7. Rigorous data is essential to improve coverage and the quality of interventions.
8. Leveraging champions and building advocacy coalitions are essential to support and sustain the progress made.

Based on the study findings and the results of a sustainability assessment conducted by Harvard University on the dimensions and determinants of sustainability in Bangladesh, the following lessons have been learned around the sustainability of the programme:

- **Financing:** The gains in nutrition require sustained funding to continue success; without sustained financing, activities are at risk due to a decline in dose and fidelity over time which will affect outcomes.
- **Incentive schemes:** Incentives (financial or non-financial such as awards or certificates) are important to motivate frontline workers (FLWs) to integrate Maternal, Infant and Young Child Nutrition (MIYCN) into their work. Currently the Government of Bangladesh (GoB) does not provide incentives to health workers. Advocacy among policymakers will be required to incorporate this approach into the government system and take it to scale.
- **FLWs' competing priorities:** When integrating MIYCN into existing FLW roles, special effort must be made to protect gains in MIYCN as health workers are often stretched thinly with many priorities.
- **Health workforce turnover:** High turnover of FLWs and high-level officials can lead to difficulty in maintaining a shared understanding of and commitment to nutrition priorities.
- **Social and behavioral factors:** Social and behavioral challenges are persistent and require sustained efforts to reach new caregivers entering the 1,000 day period and sustained efforts to motivate FLWs to persist in their interpersonal counselling (IPC) despite Social Behaviour Change (SBC) challenges.

### Integration of maternal nutrition into large-scale MNCH services

BRAC has continued to support intensive counselling on maternal nutrition as part of its ongoing Essential Health Care programme. The compelling results of the implementation research have influenced the Government of Bangladesh (GoB) to accelerate the mainstreaming of maternal nutrition in the health system. The GoB, Alive & Thrive (A&T) and other partners have

utilised and incorporated evidence and lessons learned from this research into several national strategy plans and documents and maternal nutrition Social Behaviour Change (SBC) approaches and counselling messages have been institutionalised into national nutrition frameworks, guidelines and tools to strengthen service delivery coverage and quality. Several interlinked progressive steps were taken to this end:

- **ANC services delivered at primary health care facilities (Community Clinics):** Integration of priority maternal nutrition components (counselling, weight gain tracking and iron folic acid (IFA) supplementation) in training materials, supervision checklists and counselling materials.
- **Disbursement linked indicators (DLIs):** Maternal nutrition indicators have been included in the DLIs under the World Bank (WB) funded Health Sector Support Project (2017-2022). Indicators were included around counselling, tracking weight gain and IFA supplementation. This has accelerated capacity building for community health care providers and other frontline workers (FLWs) to deliver and track maternal nutrition services (see below).
- **National Quality Assessment Guidelines for maternal nutrition:** This is conducted by National Nutrition Services (NNS) to drive routine monitoring and a continuous closing of gaps and bottlenecks. The guidelines for Maternal, Infant and Young Child Nutrition (MIYCN) were developed by A&T at the request of the GoB.
- **Comprehensive Competency-based Training for Nutrition:** Pre-service training on maternal nutrition for FLWs has been updated and expanded.
- **National Guidelines for Maternal Nutrition (2020):** National guidelines have been developed and include SBC approaches and key maternal counselling messages.
- **National Nutrition Services Operational Plan (NNS-OP):** The NNS-OP prioritises and mainstreams maternal nutrition interventions and costs programme components including maternal nutrition, SBC and mass media messaging.



Frontline worker taking the weight of a pregnant woman, Bangladesh, 2017



- **Nutrition Information and Planning Unit:** Maternal nutrition indicators have been included in the national Health Management Information System (HMIS).
- **Directorate General of Family Planning (DGFP):** MIYCN messages have been disseminated through DGFP FLWs.
- **Infant and Young Child Feeding Alliance:**<sup>6</sup> Advocacy led to the successful integration of maternal nutrition into the terms of reference for the Infant and Young Child Feeding (IYCF) Alliance (which was previously absent from the Alliance's mandate).

The inclusion of the three maternal nutrition DLIs under the WB funded Health Sector Support Project (2017-2022) (and two DLIs related to infant and young child nutrition) were major wins because they elevated the profile of maternal nutrition within the government. This is linked to the disbursement of significant funds by the WB. The process of including these indicators has enabled a strengthening of the culture of data use within the government (as they are now tracking and reviewing these maternal nutrition indicators on a routine basis). Additionally, there has been increased attention paid to the *quality* of service delivery. As part of the requirements for reaching the DLIs, the GoB needed to put in place quality assessment guidelines (one for maternal nutrition and one for child nutrition) and use the guidelines to conduct an assessment of MIYCN service quality. A&T provided technical assistance to the government to develop the guidelines and the methodology and tools for the assessments.

## Integration of maternal nutrition into social protection programming

The results of the implementation research also influenced the Ministry of Women and Children Affairs (MoWCA) to accelerate the mainstreaming of maternal nutrition in nutrition-sensitive programming, notably into the government's Improved Maternity and Lactating Mother Allowance (IMLMA). With an aim to improve the nutrition situation of poor and extreme poor women, IMLMA is a cash transfer plus health service social protection programme funded and led by the Department of Women Affairs under MoWCA with the commissioned technical assistance of the WFP. It builds on the Mother Child Benefit Program (MCBP) and further prioritises nutrition and adoption of key MIYCN practices. A&T was asked by the Government of Bangladesh (GoB) and the WFP to develop the nutrition Social Behaviour Change Communication (SBCC) strategy for the IMLMA project, which serves to guide the integration of SBCC nutrition approaches into existing IMLMA activities and platforms.

IMLMA beneficiaries receive support for five years, from pregnancy through until the child reaches four years of age. The national Social Behaviour Change (SBC) strategy developed by A&T outlines the priority nutrition practices, the target audiences, approaches and

communications channels, SBC materials and a monitoring and evaluation framework. IMLMA is currently being evaluated in eight upazilas from eight divisions of the country by IFPRI. Based on the lessons learned, the government intends to scale up the IMLMA activities to 64 upazilas by 2021.

## Challenges experienced in the integration process

These experiences highlight several challenges in the integration of maternal nutrition into nutrition-specific and nutrition-sensitive systems. Firstly, health facilities, especially primary health care facilities, are overburdened with a high workload and personnel and logistics shortages. Integration of maternal nutrition needs to be done carefully to ensure high coverage and quality. This may require advocacy to fill vacant posts or task shift among existing frontline workers (FLWs) that presents challenges. While there are two cadres of community-based workers in the current system (Health and Family Planning Directorate's Health Assistants (HA) and Family Welfare Assistants (FWA)), neither report to the National Nutrition Services (NNS). Officially, FWAs are tasked with providing MIYCN messages, screening for malnutrition and providing IFA supplementation during their domiciliary and community level activities. However, since primary target of FWAs is the promotion of family planning methods, the quality and coverage of MIYCN services are limited.

Incentives (financial or non-financial) are important for motivating FLWs and require strong policy advocacy for investment in incentive schemes. For instance, India is a good example of incentive schemes for FLWs that have gone to scale. BRAC continues to use incentives to improve performance management. However, incentives are not widely used in the Government of Bangladesh (GoB) public health system with the exception of within family planning and the expanded programme on immunisation platforms. In addition, there is a high turnover among FLWs, supervisors and management and leadership at national and sub-national levels which can impede maintaining a shared understanding and commitment to improving maternal nutrition.

Finally, routine monitoring systems are constrained by workload burdens, capacity issues and technology challenges which limit the information available to make timely and strategic decisions to improve the quality and coverage of maternal nutrition interventions. These issues will need to be addressed in the long term in order to achieve high impact.

## Conclusions

The A&T implementation research integrating maternal nutrition into existing large-scale programme platforms demonstrated significant impacts on the coverage of maternal nutrition services, maternal dietary diversity, the number of IFA and calcium supplements consumed and the exclusive breast-feeding rate in a relatively short time period (one year). The effects of the programme were likely to be due to a carefully

designed, context-specific package of maternal nutrition interventions and the high quality and coverage of the programme delivery.

A&T, together with the Government of Bangladesh and partners, has utilised the lessons learned to accelerate the mainstreaming of maternal nutrition into nutrition-specific and nutrition-sensitive programming. A&T, as a trusted technical assistance provider and knowledge partner, is accelerating the drive for systemic change in key government priority areas that all require tremendous stakeholder engagement. This includes the use of data for decision-making by district and upazila managers and (FLWs), building the skills of FLWs to deliver high quality maternal nutrition counselling with guidelines and tools and strengthening supportive supervision practice and community engagement to raise awareness of the importance of maternal nutrition. The intention is that the system achieves sustainable increases in the quality and coverage of maternal nutrition interventions and ultimately results in the improved health and well-being of women and their children in Bangladesh.

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<sup>6</sup> The IYCF Alliance is a national technical working group on nutrition that is Government-led and includes development partners. It started with a focus on IYCF and then expanded its mandate to include maternal nutrition, although its original name remained (IYCF Alliance).

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This selection of summaries and 'snapshots' of peer-reviewed papers provides important evidence to inform the policy and programming discourse around child wasting in South Asia. Several epidemiological papers describe the prevalence, patterns and drivers of child wasting in the region while others evidence that size at birth,

maternal undernutrition and early growth faltering are key drivers of wasting. Summaries of interventions on maternal nutrition to improve child nutrition status include research on food and cash transfers in Nepal, food supplementation in Pakistan and integrated maternal nutrition interventions in Bangladesh. Three snapshots touch on infant and young child feeding, de-

scribing evidence of wasting protection from optimal practice, environmental enteric dysfunction and stunting links, and the potential to influence gut microbiota in malnourished children using adapted complementary foods. Recently published papers project global and considerable regional impact of the COVID-19 pandemic on levels of child wasting.

## BANGLADESH

### Integrating nutrition interventions into an existing maternal, neonatal and child health programme in Bangladesh Research snapshot<sup>1</sup>

Maternal undernutrition is a major public health concern globally, contributing to poor foetal and early childhood growth, and increased infant morbidity and mortality. Limited evidence exists on delivering multiple interventions for maternal nutrition simultaneously. Alive & Thrive addressed this gap by integrating nutrition services into an existing maternal, neonatal and child health (MNCH) programme in Bangladesh. In the nutrition-focused model, besides standard antenatal care (ANC), women received intensive antenatal and postpartum nutrition counselling, pregnancy weight monitoring, provision of free calcium and iron and folic acid (IFA) supplements, and promotion of optimal breastfeeding practices, all provided through monthly home visits by a health worker or volunteer. Community mobilisation was carried out simultaneously through videos and discussions with women, husbands, family members and community members. The effect of providing nutrition-focused MNCH compared with standard MNCH (ANC with

standard nutrition counselling) was evaluated through a cluster-randomised evaluation.

Cross-sectional surveys were undertaken at baseline (2015) and endline (2016) with 300 and 1,000 pregnant or recently delivered women respectively per survey round. Difference-in-difference effect estimates were derived, adjusted for geographic clustering and infant age and sex. Household exposure to frontline workers was high in both groups (80-90%), but was significantly higher in nutrition-focused MNCH areas at endline. Mothers in the nutrition-focused MNCH group were visited more frequently than those in the standard MNCH group by health workers [6.0 times (95% CI: 5.8, 6.1 times) compared with 3.7 times (95% CI: 3.6, 3.9 times)] and by health volunteers [8.1 times (95% CI: 7.8, 8.5 times) compared with 3.2 times (95% CI: 2.9, 3.4 times)]. Coverage of community mobilisation activities was around 50%. Improvements were significantly greater in the nutrition-focused MNCH group than in

the standard MNCH group for consumption of IFA [effect: 9.8 percentage points (pp); 46 tablets] and calcium supplements (effect: 12.8 pp; 50 tablets). Significant impacts were observed for the number of food groups consumed (effect: 1.6 food groups), percentage of women who consumed  $\geq 5$  food groups per day (effect: 30.0 pp), and daily intakes of several micronutrients. A significant impact was also observed for exclusive breastfeeding ((EBF); effect: 31 pp) but not for early initiation of breastfeeding. The authors conclude that the integration of nutrition interventions into ANC is effective when implemented well, particularly when facilitated by a solid and functional system for early pregnancy detection and ANC service delivery.

<sup>1</sup> Nguyen PH, Kim SS, Sanghvi T, et al. Integrating Nutrition Interventions into an Existing Maternal, Neonatal, and Child Health Program Increased Maternal Dietary Diversity, Micronutrient Intake, and Exclusive Breastfeeding Practices in Bangladesh: Results of a Cluster-Randomized Program Evaluation. *J Nutr.* 2017;147(12):2326-2337. doi:10.3945/jn.117.257303. <https://pubmed.ncbi.nlm.nih.gov/29021370/>

### Factors influencing maternal nutrition practices in a large scale maternal, neonatal and child health programme in Bangladesh Research snapshot<sup>1</sup>

Improving maternal nutrition practices during pregnancy is essential to reduce the high burden of maternal, infant and child undernutrition and mortality. This paper examines the maternal, household and health-service factors influencing maternal nutrition practices in the context of a large-scale maternal, neonatal and child health (MNCH) programme in Bangladesh. Data were drawn from a household survey of pregnant (n = 600) and recently delivered women (n = 2,000). Multivariate linear and logistic regression analyses were used to examine the determinants of three outcomes: consumption of iron and folic acid (IFA) tablets; consumption of calcium tablets; and diverse diets. During pregnancy, women consumed 94  $\pm$  68 IFA and 82  $\pm$  66 calcium tablets (out of 180 as recom-

mended) and only half consumed an adequately diverse diet. Good nutrition knowledge was the key maternal factor associated with higher consumption of IFA ( $\beta = 32.5$ , 95% CI: 19.5, 45.6), calcium tablets ( $\beta \sim 31.9$ , 95% CI: 20.9, 43.0) and diverse diet (OR = 1.8, 95% CI: 1.0 $\pm$ 3.1), compared to poor knowledge. Women's self-efficacy in following recommended practices and perception of enabling social norms were significantly associated with dietary diversity. At the household level, women who reported a high level of spousal support were more likely to consume IFA ( $\beta = 25.0$ , 95% CI: 18.0, 32.1) and calcium tablets ( $\beta = 26.6$ , 95% CI: 19.4, 33.7) and have a diverse diet (OR = 1.9, 95% CI: 1.2, 3.3), compared to those who received low support. Health-service factors associated with higher intakes of IFA and

calcium tablets were early and more prenatal care visits and receipt of free supplements. Combined exposure to several of these factors was attributed to the consumption of an additional 46 IFA and 53 calcium tablets and 17% higher proportion of women consuming diverse diets.

MNCH programmes provide a delivery platform with the potential to reach large proportions of pregnant women with essential nutrition interventions. However, effective integration of a package of nutrition interventions may require priority strategies. This study illustrates that improving both demand side (such as maternal knowledge, self-efficacy and perceptions of social norms) and supply side (such as early registration in prenatal care and provision of free supplements), together with family support, have the potential to improve maternal nutrition practices.

<sup>1</sup> Nguyen PH, Sanghvi T, Kim SS, et al. Factors influencing maternal nutrition practices in a large scale maternal, newborn and child health program in Bangladesh. *PLoS One.* 2017;12(7):e0179873. Published 2017 Jul 10. doi:10.1371/journal.pone.0179873 <https://pubmed.ncbi.nlm.nih.gov/28692689/>



## The effect of the COVID-19 pandemic on the social, economic and health status of low-income populations in India

Research snapshot<sup>1</sup>

In response to surging COVID-19 cases, the Government of India imposed a lockdown in most districts of the 22 States and Union Territories from 24th March until 31st May, when restrictions began to be lifted. The effects of this lockdown on the social, economic and health status of the population, especially for poorer members of society, warrants investigation. The authors conducted a literature review of PubMed, Google Scholar and grey literature sources for relevant publications between January and May 2020.

Results of the review show that, while the nationwide lockdown has resulted in financial losses affecting all segments of society, the impact has been especially severe for low-earning and migrant workers. One study showed that 89% of internal migrant workers (93% of the workforce) were not paid wages during the first 21 days of lockdown. Other projections estimate a 23% reduction in the remittance of money home to India from expatriate migrant workers during 2020 (another important source of income). Reduced incomes are likely to lead to increases in malnutrition for the most vulnerable and government safety net schemes are inadequate. Although the Food Corporation of India recently allotted 13,000 metric tonnes of grain for distribution, the efficacy of this is not yet known. Global modelling suggests that projected reductions in maternal and child health services and increases in levels of malnutrition will result in substantial increases in child and maternal deaths.

With regard to health, the high prevalence of non-communicable diseases (a key risk factor for COVID-19), especially in relatively young individuals, is putting younger lives at risk from COVID-19 related morbidity and mortality. Other health complications predicted as a result of the pandemic include the worsening of glycaemic control and resultant diabetes-related complications, weight gain in some populations due to reduced exercise and increased snacking and an increase in infectious diseases such as HIV, TB and malaria due to interruption to an-

tiretroviral therapy (ART), reductions in timely diagnoses and reduced prevention activities. Mental health disorders such as anxiety and depression will also likely increase.

The authors conclude that the economic and health consequences of the pandemic and lockdown are likely to disproportionately affect vulnerable and marginalised populations and could have long-lasting effects. Policies and programmes are needed to tackle these issues including the mitigation of economic stress and the strengthening of national health programmes for both communicable and non-communicable diseases.

<sup>1</sup> Gopalan, Hema S., and Anoop Misra. "COVID-19 Pandemic and Challenges for Socio-economic Issues, Healthcare and National Programs in India." *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* (2020). <https://doi.org/10.1016/j.dsx.2020.05.041>



Vegetables distributed to lactating mothers and children below 5 during Covid 19 Lockdown, Gujarat, India

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## Severe wasting among Indian infants under six months of age

Research snapshot<sup>1</sup>

The burden and risk factors for wasting among infants under six months of age in India are not well documented. Data from India's National Family Health Survey 4 were used to estimate the prevalence of severe wasting, defined by weight-for-length < -3SD, among 18,898 infants under six months of age. The association of severe wasting with household, maternal and child-related factors was examined using multivariable logistic regression analysis. Results reveal prevalence of severe wasting among infants under six months of age of 14.8%, ranging from 3.5% to 21% across different states. Higher odds of severe

wasting were associated with low birth weight (LBW), defined as <2,500 grams (adjusted odds ratio (AOR) 1.40, 95% Confidence Interval (CI) (1.19,1.65)); mother not utilising supplementary nutrition from government during lactation (AOR 1.23, 95% CI (1.05,1.43)); and anthropometry assessment occurring during summer (AOR 1.37, 95% CI (1.13, 1.65) and monsoon months (AOR 1.53, 95% CI (1.20, 1.95). Infants aged two to three months (AOR 0.78, 95% CI (0.66, 0.93) and four to five months (AOR 0.65, 95% CI (0.55, 0.73) had lower odds of being severely wasted compared to infants aged up to one month.

Results reveal a high burden of severe wasting in infants under six months of age in India, with significant variability across states. Given the short- and long-term consequences of severe wasting, it is imperative that actions are taken for its prevention and management. Ambitious life-course approaches to achieve improved health and nutrition among women of reproductive age, including during the antenatal period, should be explored for effective prevention of LBW. Appropriate care practices at facilities and post-discharge with extra attention to infants born LBW and sick, often lacking in India, are also important to prevent further deterioration in nutrition status. More research is needed to assess the possible association between season and severe wasting in this age group.

<sup>1</sup> Choudhary TS, Srivastava A, Chowdhury R, et al. Severe wasting among Indian infants < 6 months: Findings from the National Family Health Survey 4. *Matern Child Nutr.* 2019;e12866. <https://doi.org/10.1111/mcn.12866>

# Burden of child and maternal malnutrition and trends in states of India 1990-2017

Research snapshot<sup>1</sup>

India has a large and persistent burden of malnutrition. However, with a population of 1.4 billion people residing across states which are at varying levels of health transition, burdens of malnutrition are uneven. This study presents indicators of malnutrition from multiple sources for each state in India from 1990 to 2017 and models the prevalence of malnutrition up to 2030 based on the 1990-2017 trends. The projections are compared with Indian targets (India National Nutrition Mission (NNM) 2022) and global targets (World Health Organization (WHO) and the United Nations Children's fund (UNICEF) 2030) to inform state-specific policy action.

Results show that malnutrition was the predominant risk factor for death in children under five years of age in every state of India in 2017, contributing to 68.2% (95% confidence interval (CI) 65.8-70.7) of under-five deaths. Malnutrition was also the leading risk factor for loss of health for all ages and responsible for 17.3% (16.3-18.2) of total disability-adjusted life years (DALYs). The prevalence of various forms of undernutrition in India in 2017 was

21.4% (20.8-21.9) for low birth weight; 39.3% (38.7-40.1) for child stunting; 15.7% (15.6-15.9) for child wasting; 32.7% (32.3-33.1) for child underweight; 59.7% (56.2-63.8) for anaemia in children; 54.4% (53.7-55.2) for anaemia in women aged 15-49 years; 53.3% (51.5-54.9) for exclusive breastfeeding; and 11.5% (8.5-14.9) for child overweight. If the trends continue by 2022 there will be an estimated excess prevalence of 8.9% for low birth-weight, 9.6% for stunting, 4.8% for underweight, 11.7% for anaemia in children, and 13.8% for anaemia in women relative to NNM targets. By 2030, if current trends persist, there will be a 10.4% excess prevalence for wasting and 14.5% excess prevalence for overweight, and 10.7% less exclusive breastfeeding compared to UNICEF and WHO targets. Burdens and gaps vary substantially between states; Uttar Pradesh, Bihar, Assam and Rajasthan had the highest burdens of malnutrition.

Results highlight that malnutrition remains one of the most serious public health challenges across India, with substantial heterogeneity across states. Higher rates of improvement will



Woman and her child in India

be needed for all malnutrition indicators in most states to achieve the Indian 2022 and the global 2030 targets. The policy momentum generated by the new NNM can benefit from this state-level data to try get malnutrition targets back on track.

<sup>1</sup> India State-Level Disease Burden Initiative Malnutrition Collaborators. The burden of child and maternal malnutrition and trends in its indicators in the states of India: the Global Burden of Disease Study 1990-2017. *Lancet Child Adolesc Health*. 2019; 3: 855-70. [https://doi.org/10.1016/S2352-4642\(19\)30273-1](https://doi.org/10.1016/S2352-4642(19)30273-1)

## PAKISTAN

# Effect of supplementation during pregnancy and lactation on the nutritional status of infants in Pakistan

Research snapshot<sup>1</sup>

Despite economic and social development, malnutrition remains a major public health problem in Pakistan, especially low birthweight, wasting, stunting and micronutrient deficiencies. A recent randomised controlled trial in the Thatta and

Sujawal districts of Sindh in Pakistan studied the effects of providing fortified wheat-soya blended flour (WSB+) to pregnant and lactating women on infant nutrition outcomes.

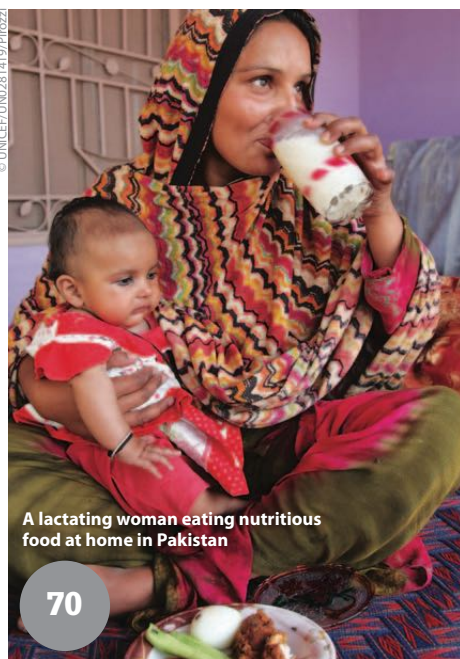
The study, which took place from 2014 to 2016, recruited 2,030 pregnant women and provided some of them with a monthly ration of 5 kg (i.e., 165 g/day) of WSB+ during their pregnancy and for the first six months of breastfeeding. Outcomes assessed were maternal weight gain, the prevalence of low birthweight and the nutritional status of the infants at six months of age. No difference was found in weight gain during pregnancy between the intervention and control groups (n=496, 326.7 g/week 95% CI 315.2-338.1 vs. n=507, 306.9 g/week, 95% CI 279.9-333.9, P=0.192) nor in the prevalence of low birthweight (n=325, 34.0%, 95% CI 31.7-36.4, vs. n=127, 34.3%, 95% CI 27.2-41.5, P=0.932).

However, there was a significant improvement in the nutritional status of the infants at six months who had a reduced risk of wasting (n=1330, RR 0.77, 95% CI 0.65-0.91, P=0.003),

and being underweight (n=1295, RR 0.77, 95% CI 0.69-0.87, P<0.001). Although the risk of stunting at six months of age was also reduced in the intervention group, after adjusting for confounding factors, there was no statistically significant difference (n=1318, RR 0.91, 95% CI 0.78-1.07, P=0.253). A significant reduction in anaemia was also noted in infants at six months of age in the intervention group (n=1328, RR 0.94, 95% CI 0.91-0.98, P=0.002).

These results suggest that the provision of WSB+ during pregnancy and lactation is effective in reducing the risk of undernutrition and anaemia in infants at six months of age. The success of this intervention should be noted by governments, donor agencies and other implementers seeking to improve the nutritional status of infants and children in the region.

<sup>1</sup> Khan, G.N., Ariff, S., Kureishy, S. et al. Effectiveness of wheat soya blend supplementation during pregnancy and lactation on pregnancy outcomes and nutritional status of their infants at 6 months of age in Thatta and Sujawal districts of Sindh, Pakistan: a cluster randomized-controlled trial. *Eur J Nutr* (2020). <https://doi.org/10.1007/s00394-020-02276-3>



A lactating woman eating nutritious food at home in Pakistan



# Impact on birth weight and child growth of women's groups with and without transfers of food or cash during pregnancy in Nepal

## Research snapshot<sup>1</sup>

While the links between undernutrition in pregnancy and birth outcomes have long been established, understanding of the effectiveness of intervening prenatally to improve birth outcomes and subsequent child growth remains limited. This study aimed to explore potential interventions in pregnancy to improve birthweight and subsequent child growth until 16 months of age (measured by weight-for-age z-scores (WAZ)). Behaviour-change interventions were facilitated through community-based participatory learning and action (PLA) women's groups, with and without food or cash transfers. A four-arm, non-blinded cluster randomised control trial was designed, with 25,092 pregnant women recruited for interventions between December 2013 and February 2015. The four arms consisted of: PLA alone (n=5,626, receiving nutrition and health educational sessions); PLA plus food (n= 6,884, receiving 10 kg/month of fortified wheat-soya 'SuperCereal' on a monthly basis); PLA plus cash (n= 7,272, receiving ≈USD7.5 per month, equivalent to the cost of 10kg of Super Cereal or two days' wage labour); and a control arm (n=5,310, receiving government services). Women were entitled to one monthly transfer up to a maximum of seven transfers until delivery, provided they received the transfer personally and had photo ID cards. Primary outcomes were birthweight measured within 72 hours and WAZ measured at endline.

After exclusions, 10,936 women were eligible for outcome analyses. In PLA plus food/cash arms, 94% to 97% of pregnant women attended the PLA groups and received an average of four transfers. In the PLA-only cohort, 49% of pregnant women attended PLA groups. Response rate for birthweight was low (n=2,087; 22% of potential birthweights) due to conflict affecting field-team performance, but endline data was higher (n=9,242). Compared to the control arm, mean birthweight was significantly higher in the PLA-plus-food arm by 78g (95%CI 13.9-142), but not significantly higher in PLA-only and PLA-plus-cash arms. Average WAZ measurements of children aged 0-16 months (average age nine months) sampled cross-sectionally at endpoint were not significantly different from those in the control arm. When exploring secondary outcomes, compared with control, more institutional deliveries (OR= 1.46; 95% CI 1.03, 2.06) and less colostrum discarding (OR=0.71; 95% CI 0.54, 0.93) were noted in the PLA plus-food-arm, but not in PLA-only or PLA-plus-cash arms.

This study showed that food supplementation with behaviour-change strategies during pregnancy increased birthweight (suggest cautious conclusion given low response rate on birthweight data [eds]). However, the improvements were not sustained by 16 months. This highlights the need for additional interventions for infants postpartum to improve growth outcomes.



Caregivers at a Food/Cash-for-Assets programme targeting the most food insecure and vulnerable communities in Nepal

<sup>1</sup> Saville NM, Shrestha BP, Style S, Harris-Fry H, Beard BJ, Sen A, et al. (2018) Impact on birth weight and child growth of Participatory Learning and Action women's groups with and without transfers of food or cash during pregnancy: Findings of the low birth weight South Asia cluster-randomised controlled trial (LBWSAT) in Nepal. *PLoS ONE* 13(5): e0194064. <https://doi.org/10.1371/journal.pone.0194064>

## Maternal profiles and social determinants of severe acute malnutrition among children under five years of age:

### A case-control study in Nepal Research snapshot<sup>1</sup>

Malnutrition remains a major public health issue in Nepal and is estimated to be the underlying cause of 50% of child deaths. An estimated 10% of children under five years of age are wasted in Nepal and the prevalence of severe acute malnutrition (SAM) has increased considerably since 2001. Understanding the determinates of SAM in this context is important for finding effective ways to prevent cases. This recent study gathered data from general hospital admissions to identify maternal and social factors associated with SAM.

Using an unmatched case-control study design, admissions to the study hospital were screened and 256 children aged 6-59 months identified for inclusion. A total of 128 children were classified as SAM based on mid-upper arm circumference (MUAC)<115mm or oedema and

128 were classified as controls (MUAC>125mm). Any children with a chronic illness such as human immunodeficiency virus, tuberculosis or disability were excluded. Using backwards, stepwise logistic regression, the authors found odds of SAM were lower among boys (adjusted odds ratio (AOR) = 0.50, 95% CI = 0.27-0.92), mothers with higher socioeconomic status (AOR = 0.469, 95% CI = 0.26-0.83), those breastfeeding infants aged 6 to 12 months (AOR = 0.21, 95% CI = 0.05-0.68), those breastfeeding infants aged ≥13 months (AOR = 0.18, 95% CI = 0.05-0.54) and those providing optimal complementary feeding (AOR = 0.40, 95% CI = 0.22-0.70). Odds of SAM were significantly higher among younger children (aged 6-24 months; AOR = 2.57, 95% CI = 1.30-5.22) and children with a history of diarrhoea (AOR = 1.75, 95% CI = 0.92-3.39).

These results suggest that prevalence of SAM could be positively impacted though scale-up of services to improve education and job opportunities for mothers. Infant and young child feeding interventions, such as increasing the prevalence of exclusive breastfeeding and optimal complementary feeding, could also reduce risk of SAM. Girls seem to be more vulnerable than boys in this setting and so could be prioritised where services are limited. Lastly, results suggest that interventions to reduce risk of diarrhoea in children, such as availability and usage of soap for handwashing, could also positively impact nutritional status.

<sup>1</sup> Hossain, Ahmed et al. Maternal profiles and social determinants of severe acute malnutrition among children under-five years of age: A case-control study in Nepal. *Heliyon* 6.5 (2020): e03849. <https://www.sciencedirect.com/science/article/pii/S2405844020306940>

## Aiming higher for maternal and child nutrition in South Asia

Research snapshot<sup>1</sup>

South Asia has the greatest burden of wasted and stunted children of any region in the world. These children are more likely to experience ill health and developmental deficits in childhood and lower productivity and poorer livelihoods as adults. This article introduces and summarises the findings of a special supplement on 'Height Heights: A Greater Ambition for Maternal and Child Nutrition in South Asia', which brings together 15 articles on the time trends, distribution and determinants of maternal and child malnutrition and the effectiveness of policy and programme actions to increase the coverage of essential nutrition actions in South Asia.

The articles highlight the role of socioeconomic disadvantage, poor maternal nutrition and poor diets in early life in driving the high prevalence of both wasting and stunting in South Asia. Poor maternal nutrition (low body mass index and short stature) and low birth weight (LBW) are consistent predictors of stunting and wasting. Programme approaches that have proven effective in improving the cov-

erage of nutrition interventions during pregnancy have several common features: use of formative research to inform programme design; service delivery at community level; the engagement of family members; actions to improve the performance of frontline health providers; and the provision of free iron and folic acid supplements.

Optimal infant and young child feeding practices appear to protect against wasting and stunting. The rapid fall in the prevalence of wasting during the first six months of life in several South Asia countries suggests that early and exclusive breastfeeding may help infants to recover from low weight at birth. Programmes and interventions that reach women and their families with repeated exposure early in pregnancy are more likely to improve early and exclusive breastfeeding, while interventions with no impact on breastfeeding are characterised by short duration, irregular frequency, inappropriate timing and poor coverage and targeting. The likelihood of stunting is lower in children aged 6-8 months who are fed complementary foods and in children aged 6-23 months who consume diverse diets.



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The authors conclude that a coordinated approach involving the food, health and social protection systems is needed to improve the diets of women and children in early life, alongside actions to increase girls' access education and safe water and sanitation services.

<sup>1</sup> Torlesse, H. & Aguayo, V. M. (2018). Aiming higher for maternal and child nutrition in South Asia. *Maternal & Child Nutrition*, 14(S4):e12739 <https://doi.org/10.1111/mcn.12739>

## Birthweight and feeding practices are associated with child growth outcomes in South Asia

Research snapshot<sup>1</sup>

Child wasting has received much less policy attention in South Asia than stunting, despite the region being home to over half the world's wasted children and a reduction in child wasting being one of the targets of the Sustainable Development Goal 2. In addition, there is evidence that being wasted increases individual risk of stunting,

which suggests that the high prevalence of stunting in the region is partly driven by the high prevalence of wasting. Understanding the predictors of wasting and severe wasting can help inform the design of preventive interventions. Data from recent surveys in six South Asian countries (Afghanistan, Bangladesh, India, Maldives, Nepal and Pakistan) were pooled to examine

the associations between low birth weight (LBW), breastfeeding practices and complementary feeding practices with child wasting, severe wasting and the concurrence on wasting and stunting – a highly vulnerable state that carries a similar mortality risk to severe wasting.

Using multiple logistic regression models, adjusted for the surveys' clustered designs and potential confounding factors, the analysis found that children with reported LBW were significantly more likely to be wasted, severely wasted and concurrently wasted and stunted than non-LBW infants. The analysis also revealed the protective effect of infant and young child feeding (IYCF) against child wasting. Children aged 0 to 23 months who started breastfeeding within one hour of birth, who were not given prelacteal feeds and those aged 0-5 months who were exclusively breastfed were less likely to be wasted. In India, children aged 6-23 months who were fed diverse meals were less likely to be wasted and concurrently wasted and stunted. Findings demonstrate that greater investments in improving women's nutrition both before and during pregnancy and in improving IYCF practices in early life are needed to reduce the very high prevalence of wasting in South Asia. Wasting shares these predictors with stunting, which indicates the need to address both forms of malnutrition in a more coherent manner and not to separate them conceptually or programmatically.

<sup>1</sup> Harding, K. L., Aguayo, V. M., & Webb, P. (2018). Birthweight and feeding practices are associated with child growth outcomes in South Asia. *Maternal & Child Nutrition*, 14(S4), e12650. <https://doi.org/10.1111/mcn.12650>



A 10 month old baby has his MUAC measured at an Outreach Therapeutic Centre in Cox's Bazar, Bangladesh

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## Factors associated with wasting among children under five years old in South Asia: Implications for action

Research snapshot<sup>1</sup>

The continued high prevalence and burden of child wasting in South Asia is an urgent policy priority. The region's progress towards achieving the Sustainable Development Goals' global target for wasting reduction requires the scale-up of evidence-based policies and programmes. Information on the determinants of wasting is an important component of this evidence base.

The analysis used data from national surveys in Bangladesh, India, the Maldives, Nepal, Pakistan and Afghanistan to examine the factors associated with wasting in children aged 0-59 months in each country, using multivariate logistic regression.

The prevalence of wasting varied from 9% in Afghanistan to 21% in India, while over 5% of children in Bangladesh, India and Pakistan were both wasted and stunted. Two factors that were associated with an increased risk of wasting in all six countries were the child being aged under six months and maternal thinness (the mother having a body mass index <18.5 kg/m<sup>2</sup>). Other factors that were associated with wasting in one or more countries included those pertaining to the child (later birth order and being male), the mother (illiteracy and short maternal stature) and the household (household poverty and lack of an improved water source). Previous research

has found that all of these factors are associated with an increased risk of stunting in South Asia.

The current scale of child wasting in South Asia and its shared risk factors with stunting demand much greater investment in preventive interventions to reduce the prevalence of both wasting and stunting, while ensuring treatment is available to all wasted children who need it. Preventive interventions should focus on improving the nutrition of adolescents and women before and during pregnancy to prevent low birth weight and support the early initiation of breastfeeding and exclusive breastfeeding. There is also need for greater attention to women's education; empowerment and postnatal nutrition; quality complementary foods and hygienic feeding practices; safe water and sanitation; and nutrition-sensitive public sector actions across sectors.

<sup>1</sup> Harding, K. L., Aguayo, V. M., & Webb, P. (2018). Factors associated with wasting among children under five years old in South Asia: Implications for action. *PLoS ONE* 13(7): e0198749. <https://doi.org/10.1371/journal.pone.0198749>

## Improving women's nutrition is imperative for the rapid reduction of childhood stunting in South Asia

Research snapshot<sup>1</sup>

Maternal factors, both nutritional and non-nutritional, are a significant contributor to high rates of undernutrition in children in South Asia. The implications of direct nutrition interventions on women's nutrition, birth outcomes and stunting rates in South Asia are indisputable and well documented. This paper explores such maternal factors, presenting the evidence of nutrition-specific and nutrition-sensitive interventions to improve maternal nutrition status, birth outcomes and child undernutrition.

Over the last decade, studies have shown the impact of non-nutritional factors on women's

nutrition, birth outcomes, caring practices and nutritional status, including women's empowerment and gender inequality. Research highlights the role of an early marriage and conception age, poor secondary education, domestic violence, inadequate decision-making power, poor control over resources and strenuous agriculture activities in poor child nutrition outcomes.

The authors stress that, given these factors, it is critical to intervene not only in the first 1,000 days of life but also during adolescence, pre-conception and pregnancy to support optimal child growth. Interventions to prevent early marriage and conception, empower women, increase purchasing power and

encourage school attendance are important, as are cash transfers and microfinance. Nutrition-specific interventions are also essential and should aim to improve the nutrition status of women, ensuring they enter pregnancy with adequate height and weight and are free from anaemia. Increasingly, there is a need to also consider overweight and obesity in improving maternal nutrition in the region.

The paper concludes that a comprehensive approach is needed that combines nutrition-sensitive interventions with a package of evidence-based direct nutrition interventions. A range of programme platforms promoting health, education and the empowerment of women can be strategically used to reach women, improve maternal factors linked to birth outcomes and the growth of children and accelerate a reduction in child undernutrition rates in South Asia.

<sup>1</sup> Vir, S. C. 2016. Improving women's nutrition imperative for rapid reduction of childhood stunting in South Asia: coupling of nutrition specific interventions with nutrition sensitive measures essential. *Maternal&Child Nutrition* (2016), 12 (Suppl. 1), pp. 72–90. <https://doi.org/10.1111/mcn.12255>

## GLOBAL

## Wasting in the wider context of undernutrition: An ENN position paper

Research snapshot<sup>1</sup>



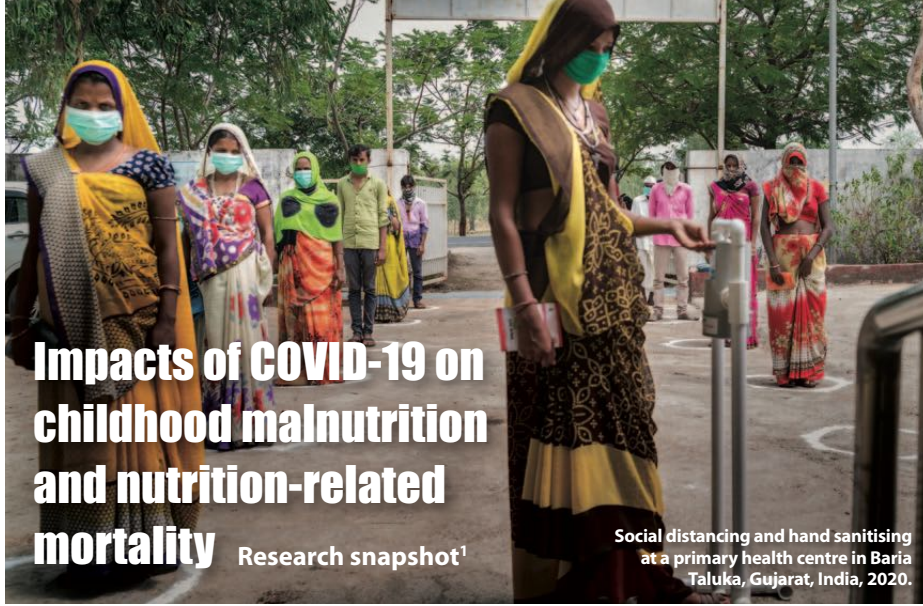
ENN has produced a position paper that explores how we view wasting in the wider context of undernutrition and what this means for nutrition and other sectors. Drawing upon our areas of work, the paper reflects evolving evidence and knowledge and aims to provide national and international actors with an overview of the current evidence and issues that can be considered in efforts to combat undernutrition.

The paper stresses that wasting cannot be viewed separately from other manifestations of undernutrition as all manifestations impact the growth, development and wellbeing of infants and children. Critically, the paper highlights the need to shift from a focus on anthropometric deficits to the consideration of the levels of risk of becoming wasted for both individuals and communities. Key preventative opportunities to avert risk throughout the lifecycle and seasonal calendar exist and should

be leveraged. These should include improving the health and nutrition of adolescent girls and pregnant women for their individual benefit and to optimise in utero growth and the subsequent growth of their infants and young children.

Triggering early action to avert individual risks and interrupt the process of wasting is vital. To support prevention and treatment efforts, country-level structures must be strengthened to deliver context-specific interventions. In protracted fragile contexts, a long-term development agenda is required. Global level mechanisms must support government-led and government-implemented programmes, informed by a coordinated knowledge and research agenda.

<sup>1</sup> [https://www.enonline.net/attachments/3595/ENN-Wasting-Position-Paper\\_FINAL.pdf](https://www.enonline.net/attachments/3595/ENN-Wasting-Position-Paper_FINAL.pdf)



## Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality

Research snapshot<sup>1</sup>

Social distancing and hand sanitising at a primary health centre in Baria Taluka, Gujarat, India, 2020.

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The COVID-19 pandemic will likely increase the risk of all forms of malnutrition as a result of rapid changes to the availability, accessibility and affordability of nutritious foods, declines in household incomes, and interruptions to health, nutrition and social protection services. The Standing Together for Nutrition consortium, a multidisciplinary consortium of researchers in the fields of nutrition, economics, food and health systems, is working to estimate the scale of malnutrition challenges related to COVID-19. Three modelling approaches have been used, analysing macroeconomic projections of impacts per capita on gross national income (GNI), microeconomic estimates of how predicted GNI shocks impact child wasting (using data on 1.26 million children from Demographic and Health Surveys conducted between 1990-2018), and the Lives Saved Tool

estimates of health service disruptions and predicted increases in child mortality.

Initial findings suggest that even short-duration lockdown measures, combined with severe mobility disruptions and comparatively moderate food system disruptions, result in an estimated average 7.9% decrease in GNI per capita in low- and middle- income countries relative to pre-COVID-19 projections. It is estimated that this will result in a 14.3% increase in moderate or severe wasting prevalence in children under five years of age, which translates to an additional 6.7 million children with wasting in 2020, predominately in south Asia and sub-Saharan Africa. Coverage of nutrition and health services, however, is estimated to reduce by an average of 25% due to COVID-19 impacts. Without adequate treatment, there could be 128,605 (estimated range

between 111,193 to 178,510) additional deaths in children under five years old during 2020. These projections emphasise the urgent need for adequate and timely action.

As a result of these worrying estimates and predictions, leaders of the four United Nations (UN) agencies responsible for child nutrition issued a commentary entitled *Child Malnutrition and COVID-19: the time to act is now*,<sup>2</sup> which calls for action in five areas:

1. Safeguarding and promoting access to nutritious, safe and affordable diets;
2. Investing in improving maternal and child nutrition through pregnancy, infancy and early childhood;
3. Reactivating and scaling up early detection and treatment of wasting services;
4. Maintaining provision of school meals for vulnerable children; and
5. Expanding social protection to safeguard access to nutritious diets and essential services.

The UN agencies estimate that a minimum of US\$2.4 billion is needed to protect vulnerable children, prevent and treat malnutrition, and avoid child deaths due to the impact of COVID-19. Critically, agencies call for a swift response, with investments from governments, donors, the private sector and the UN to enable sustained action.

<sup>1</sup> Headley, D. et al. (2020). Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality. *The Lancet*. Online. Published 27 July 2020. [https://doi.org/10.1016/S0140-6736\(20\)31647-0](https://doi.org/10.1016/S0140-6736(20)31647-0)

<sup>2</sup> Fore, H.H., Dongyu, Q., Beasley, D.M. & Ghebreyesus, T.A. (2020). *Child malnutrition and COVID-19: the time to act is now*. *The Lancet*. Online. Published 27 July 2020. [https://doi.org/10.1016/S0140-6736\(20\)31648-2](https://doi.org/10.1016/S0140-6736(20)31648-2)

## Causes and consequences of child growth failure in low- and middle-income countries

Research snapshot<sup>1</sup>

Wasting and stunting contribute to child mortality, adult morbidity, poor cognitive outcomes and negative adult economic outcomes. Current estimates attribute > 250,000 deaths annually to stunting and > 1 million deaths annually to wasting. Despite extensive recognition of the importance of improving growth outcomes for public health benefits, preventative interventions have shown only limited success. This may point to an incomplete understanding of the optimal time and ways to intervene to prevent wasting and stunting. Understanding the relationships between child, parental and household characteristics and causes and timing of child growth failure may offer insights into how to improve interventions and which higher risk children might benefit most. In this study the authors analysed 35 longitudinal cohorts (108,336 children aged 0 to 24 months) from South Asia, Africa, Latin America and Eastern Europe to quantify the effect of early growth

failure on severe outcomes in children. Cohorts were assembled as part of the Knowledge Integration (ki) initiative of the Bill & Melinda 220 Gates Foundation.

Maternal and child characteristics at birth accounted for the largest attributable differences in growth. Maternal anthropometry was a key predictor for early childhood growth failure, particularly when growth faltering began at birth. Yet, postnatal growth failure was larger than differences at birth, and characteristics of the child's household environment were additional determinants of growth failure after age 6 months. Children who experienced early ponderal or linear growth failure were at much higher risk of persistent growth failure and were 2.0 to 4.8 times more likely to die by age 24 months. Longer length of child at birth, higher maternal weight, earlier child birth order, higher maternal education level and more rooms in the household were five of the top population-level predictors of higher

length-for-age and weight-for-length at 24 months. The dry season of the year was an important predictor of higher child weight for length and taller height in mothers was important for higher child length for age. In older infants and children a key predictor was previous growth failure (before six months of age). All measures of early growth failure were significantly associated with later, more serious growth failure, with wasting indicators among the strongest of predictors.

High attributable risk from prenatal causes, and severe consequences for children who experienced early growth failure, support a focus on pre-conception and pregnancy as key opportunities for new preventive interventions. Targeting postnatal interventions by season or population subgroup (defined by risk characteristics) could reduce the persistent burden of postnatal growth failure. The results also suggest that broad improvements in wellbeing will be necessary to eliminate growth failure in low resource settings, but that screening based on weight could help identify children at highest risk of death before age 24 months.

<sup>1</sup> Mertens, A., et al. (2020). Causes and consequences of child growth failure in low- and middle-income countries. *medRxiv*: 2020.2006.2009.20127100. [www.medrxiv.org/content/10.1101/2020.06.09.20127100v1](http://www.medrxiv.org/content/10.1101/2020.06.09.20127100v1)



## Duodenal microbiota in stunted undernourished children with enteropathy

### Research snapshot<sup>1</sup>

**T**he link between environmental enteric dysfunction (EED), a disorder of the small intestine, and childhood under-nutrition has been theorised for many years. However, evidence of its contribution to growth outcomes has been limited due to the challenges of sampling small intestinal mucosa and microbiota. This study explored the link between the two by collecting plasma and duodenal samples of 110 stunted children (mean age 18 months; total samples collected included 4,077 plasma proteins and 2,619 duodenal proteins) living in an urban slum in Dhaka, Bangladesh, who had biopsy-confirmed EED. In addition, 21

plasma and 27 faecal samples from age-matched healthy children living in the same area were collected. Young, germ-free mice fed a Bangladeshi diet were subsequently colonised with bacterial strains cultured from the duodenal samples.

Results of the study indicated that, of the bacterial strains obtained from the children with EED, the absolute levels of a shared group of 14 duodenal bacterial taxa (which are not usually classified as enteropathogens) were negatively correlated with linear growth ( $p=0.003$ ) and positively correlated with duodenal proteins linked to immune-inflammatory responses. When com-

paring these faecal microbiota to samples from healthy children, the representation of these 14 taxa was significantly different ( $p<0.001$ ). When mice were colonised with the cultured duodenal strains from the children with EED, they developed enteropathy of the small intestine. Further studies are needed to determine whether findings can be generalised to other contexts.

These results indicate a causal relationship between stunting and enteropathy; particularly highlighting the role of 14 duodenal bacterial taxa. Exploring the mechanisms by which the small intestinal microbiota affect linear growth mediators in young children may help provide new therapeutic approaches to reduce and prevent stunting.

<sup>1</sup> Chen, R. Y. et al. 2020. Duodenal Microbiota in Stunted Undernourished Children with Enteropathy. *New Engl. J. Med.* 383; 4. DOI: 10.1056/NEJMoa1916004 <https://www.nejm.org/doi/full/10.1056/NEJMoa1916004>

## Early childhood linear growth failure in low- and middle-income countries

### Research snapshot<sup>1</sup>

**S**tunting affects approximately 149 million children under five years old globally.<sup>2</sup> However, estimates rely on cross-sectional surveys, which offer only limited information on growth failure trajectory, persistence and timing of onset. Such survey data also masks the dynamics of linear growth and potential reversal of linear growth failure. Information on the age of onset and its persistence offers insights on when and how to intervene with preventative measures. In this study the authors analysed 31 longitudinal cohorts from 15 low- and middle-income countries in South Asia, sub-Saharan Africa and Latin America (62,993 children, aged 0-24 months) to estimate age-specific incidence and prevalence of stunting, linear growth velocity and reversal of linear growth failure.

Across cohorts, 12% of children were stunted at birth and 17% experienced incident stunting onset between birth and three months of age. Stunted children between birth and three months accounted for 40% of all children who experienced stunting by age 24 months. Between 0 and 15 months of age, less than 5% of children reversed their stunting status per month. In children who were able to reverse stunting, relapse was common. Overall, improvements to length-for-age z-scores among children who had shown stunting reversal were neither sustained nor large enough to eliminate linear growth deficits.

These findings highlight the importance of preventive interventions; particularly in the prenatal

and postnatal stage. Interventions to improve maternal nutrition, reduce adolescent pregnancies and reduce prenatal infections may reduce the risk of linear growth failure. Additionally, more focus should be placed on postnatal interventions. However, interventions to improve exclusive breastfeeding rates and complementary feeding practices have to date shown only limited impact on child linear growth and a paucity of effective postnatal interventions to improve stunting rates remains. The authors conclude that actions to identify alternative interventions (potentially multisector in nature) and improve the quality of current interventions within the first 1,000 days of life are essential.

<sup>1</sup> Benjamin-Chung, J., et al. (2020). Early childhood linear growth failure in low- and middle-income countries. medRxiv: 2020.2006.2009.20127001. [www.medrxiv.org/content/10.1101/2020.06.09.20127001v1](https://www.medrxiv.org/content/10.1101/2020.06.09.20127001v1)  
<sup>2</sup> Based on old estimates, from World Health Organization Joint child malnutrition estimates – Levels and trends (2019 edition). [www.who.int/nutgrowthdb/estimates2018/en/\(2019\)](http://www.who.int/nutgrowthdb/estimates2018/en/(2019)). More recent estimates are available in the 2020 edition (144 million children globally are stunted).

## Development of complementary foods for moderately wasted children to improve gut microbiota status

### Research snapshot<sup>1</sup>

**C**hildren with acute malnutrition have impaired development of gut microbiota, which can affect future growth and health. Current therapeutic foods used to treat acute malnutrition have not been formulated to improve impaired gut microbiomes. A recent comprehensive study integrated findings from pre-clinical animal models with small-scale human pilot studies to understand which microbial targets are associated with better growth and which ingredients in complementary foods could increase the representation and expressed beneficial functions of these growth-promoting microbes.

The use of serially collected plasma and faecal samples from severely wasted children in Bangladesh as they recovered, combined with anthropometric data and data from healthy children, allowed for identification of growth-promoting bacterial taxa. Animal models were then used to recreate healthy and impaired gut environments and study their response to various food ingredients, leading to the creation of microbiota-directed complementary food (MDCF) prototypes. Sixty-three children aged 12 to 18 months with moderate wasting were then recruited into a randomised, double-blind study of standard

treatment versus four promising MDCF prototypes. Analysis of plasma and faecal samples from these children identified which of the MDCFs was most effective at increasing presence of proteins associated with growth, bone formation, neuro-development and immune function, and improving gut microbiota to better resemble healthy children.

This promising start now requires the further investigation of this MDCF in larger studies and across different populations in order to assess its effectiveness in repairing gut microbiota in malnourished children and improving their subsequent growth and health. Innovations in this area have the potential to reduce relapse rates and minimise the long-term implications of acute malnutrition.

<sup>1</sup> Gehrig JL, Venkatesh S, Chang HW, et al. Effects of microbiota-directed foods in gnotobiotic animals and undernourished children. *Science*. 2019;365(6449): eaau4732. doi:10.1126/science.aau4732 <https://pubmed.ncbi.nlm.nih.gov/31296738/>

## Prevention of child wasting in Asia: Possible role for multiple micronutrient supplementation in pregnancy

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A mother and her two month old child at their home in Indonesia



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## GLOBAL, INDONESIA AND BANGLADESH

**What we know:** Interventions to support nutrition in pregnancy are key to reducing wasting at birth and in early infancy.

**What this article adds:** Strong evidence exists to support a transition from iron and folic acid (IFA) supplementation to multiple micronutrient (MMS) supplementation for pregnant women. This can be justified in contexts with high levels of nutrient deficiencies where a platform exists for delivery (e.g., antenatal care services and where steps are taken to understand the cost-effectiveness of this approach). Three phases are identified in the process of adoption of MMS: i) preparatory and advisory phase (stakeholders engaged to understand evidence and build consensus on MMS use); ii) introduction (implementation research in real-world conditions); iii) scaling (building capacity for scale-up, including workforce capacity and ongoing procurement of MMS). Case studies from Indonesia and Bangladesh demonstrate how this can be applied in different contexts. In Indonesia, use of MMS as part of routine antenatal care services is being explored (phase one), with plans for implementation research and securing MMS supply for phase two. In Bangladesh a market-based model is being used to target 3.5 million pregnant women from the base of the pyramid by 2025, while a consortium of stakeholders is shaping the market to enable affordable and accessible MMS through a large network of pharmacies and social marketing to promote MMS use.

### Background

South Asia has the highest prevalence of wasting<sup>1</sup> in children under five years old of all world regions at 14.8%. Prevalence in East Asia and the Pacific is 3.7%. Countries in South and East Asia and the Pacific have two thirds (65.5%) of the 47 million children with wasting globally (UNICEF, WHO & World Bank, 2020). The highest prevalence of wasting in South Asia is at birth (Mertens et al, 2020), indicating the importance of foetal growth restriction, commonly assessed by the newborn being

small for gestational age (SGA) compared with an international foetal growth standard (Lee et al, 2017). Babies who are born SGA have an elevated risk of being wasted in early childhood compared to those who are appropriate for gestational age (odds ratio (OR) 2.46, 95% confidence interval (CI) 2.15, 2.81) (Christian et al, 2013).

With the high prevalence of wasting at birth and in early infancy, interventions during pregnancy have a role in the pre-

<sup>1</sup> Defined as <-2 z-scores weight-for-length/height.



vention of wasting, especially in South Asian countries. An antenatal intervention with promise for improving foetal growth is multiple micronutrient supplementation (MMS) (Box 1). A Cochrane Collaboration meta-analysis of 15 randomised controlled trials of MMS vs. iron and folic acid (IFA) supplementation during pregnancy in low- and middle-income countries (LMICs) found a significant reduction of SGA (relative risk 0.92, 95% CI 0.88, 0.97) (Keats et al, 2019). Even greater benefits have been demonstrated in populations with a high prevalence of anaemia in pregnant women (Smith et al, 2017). In addition, on the continuum of antenatal care interventions, MMS is among the most cost-effective, including being more cost-effective than IFA supplementation (Kashi et al, 2019).

Based on this evidence, there is a growing consensus among leading experts in the field of public health nutrition to provide MMS to pregnant women in LMICs as a replacement for IFA supplementation during antenatal care services. Many national health services interested in MMS have started to explore ways to accelerate and then sustain national MMS coverage, adherence and measurable health impact.

### Introduction and scaling up of MMS for pregnant women

A generic model (or roadmap) for exploring introduction and eventually large-scale use of any innovation in healthcare is shown in Figure 1. This approach was informed by past efforts to introduce and scale public health interventions (e.g., the introduction and scaling of oral rehydration salts for the treatment of diarrhoea (Ruxin, 1994) and the introduction and scaling of several methods of contraception). This serves as a tool for identifying an ‘entry point’ for accelerating the use of MMS and includes the following three phases:

#### Phase I: Preparatory and advisory phase:

To ensure long-term success of efforts to incorporate MMS into healthcare systems, Phase I initiatives and activities are often focused on creating an enabling environment for policy recommendations and the creation of an implementation plan. Local stakeholders are identified and engaged to: i) raise awareness and advocate for use of MMS; ii) facilitate an understanding of the evidence as it relates to the benefits of MMS over IFA; and iii) develop a consensus on the need to introduce MMS and the feasibility thereof.

In addition to awareness-raising and advocacy activities, highly motivated local influencers often seek first-hand experience with MMS use in operating health-systems settings. Such exploratory activities should be encouraged because they can help local influencers better understand how to integrate MMS into antenatal care services and even to understand how to use MMS as a vehicle for strengthening antenatal care services. In this regard, exploratory use of MMS by local influencers can inform policy formation and the subsequent design of more formal introductory initiatives (see Phase II below). Finally, because MMS may not be widely available at country level and significant lead time may be needed to produce or import the supplements, Phase I also must focus attention (if needed) on the question of how to access MMS supplies, including the capacity and potential for local production.

#### Phase II: Introduction:

As stakeholders arrive at a consensus to adopt use of MMS, they often generate questions about the most effective and efficient ways to organise and introduce its delivery. Phase II allows stake-

holders the opportunity to conduct implementation research to answer these questions and to learn how to incorporate the intervention under real-world conditions before making a national commitment. Additionally, local authorities may use Phase II as an opportunity to solidify plans for eventual procurement (or long-term product donation in fragile contexts) for Phase III scaling.

#### Phase III: Scaling:

Once initial introduction is complete, attention turns to building capacity for large-scale deployment of MMS nationally. For local authorities, this means scaling the workforce capacities developed during the introduction phase to achieve coverage across the entire country. Apart from continuing education for healthcare providers and adjustments to ongoing monitoring and evaluation, there will also be a need to develop a healthy marketplace for ongoing procurement of MMS, whether from local or global suppliers.

### When is it appropriate to being to examine introduction and scaling of MMS and decide on an entry point for action?

While there is strong evidence to support a transition from iron and folic acid supplementation (IFA) to MMS, the World Health Organization (WHO) has not provided clear guidance on how to determine under what circumstances the introduction and use of MMS is justifiable, beyond stating in its 2016 Antenatal Care Guidelines that, “policy-makers in populations with a high prevalence of nutritional deficiencies might consider the benefits of MMS supplements to maternal health to outweigh the disadvantages, and may choose to give MMS supplements that include iron and folic acid.” (WHO, 2016). To address this gap in guidance, the Task Force for Multiple

### Box 1 MMS formulation

United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP) formula, which contains 15 micronutrients, is the current recommended multiple micronutrient supplement for pregnant women.

Composition:

Vitamin A	800 µg
Vitamin D	200 IU
Vitamin E	10 mg
Vitamin C	70 mg
Vitamin B1	1.4 mg
Vitamin B2	1.4 mg
Niacin	18 mg
Vitamin B6	1.9 mg
Vitamin B12	2.6 µg
Folic acid	400 µg
Iron	30 mg
Zinc	15 mg
Copper	2 mg
Selenium	65 µg
Iodine	150 µg

Source: UNICEF, WHO, UN, 1999



A pregnant woman receiving MMS during a consultation with a community health worker in Pasay

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Micronutrient Supplementation for Pregnant Women (Bourassa *et al*, 2019) recently specified overall conditions on how to determine readiness of a national health system to begin to explore a transition from IFA to MMS. Its principal recommendations are that exploring the transition is justifiable when:

- Documentation exists of high levels of nutritional deficiency in the population at large;
- The health system has an existing platform, such as antenatal care services, to deliver MMS; and
- Steps have or are being taken to understand the cost-related implications of using MMS, focused primarily on cost-effectiveness.

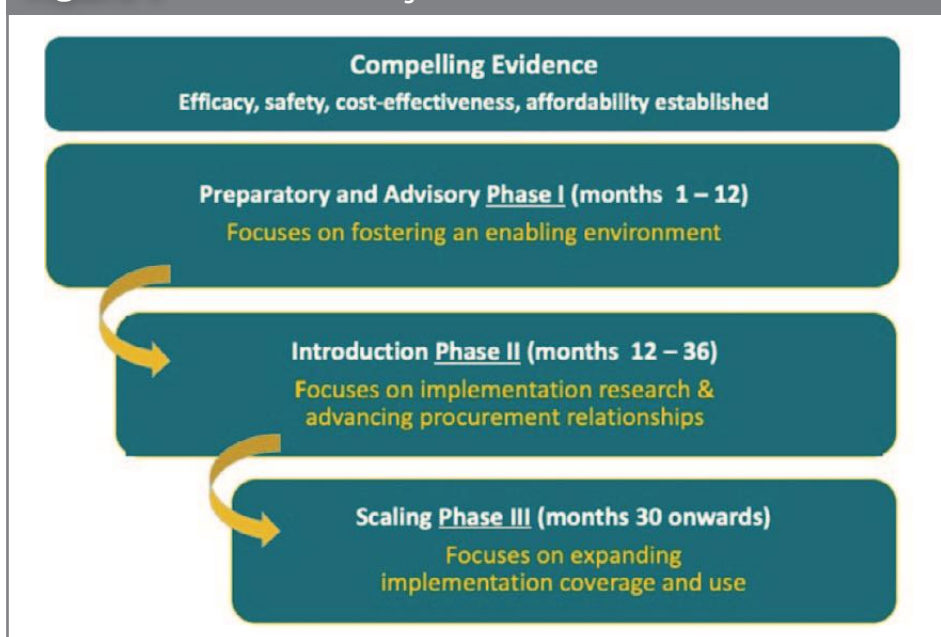
It should be noted that just before publication of this article, WHO released new antenatal care guidelines to update its previous “no recommendation” on MMS to a “yes recommendation — context specific” in which WHO recommends use of MMS in the context of continuing research. Of note is that WHO appears to recommend implementation research of the type that is presented in the case studies below as a possible entry point of introduction of MMS (WHO, 2020). The new antenatal care guidelines which recommend that MMS be explored in a research context are consistent with the interpretive guidance provided by the MMS - TAG that MMS be explored in populations that are experiencing a high prevalence of micronutrient deficiencies, where there is an existing antenatal care service delivery platform, and that cost-effectiveness be considered in the exploration of MMS introduction. The full implications of the release of the new 2020 WHO Antenatal Care Guidelines is yet to be fully digested, and inevitably, there will be a lot of public discussion about the implications of those guidelines.

With overall conditions fulfilled, there is still an important need to decide on the ‘entry point’ for activities that can lead to a meaningful conversation about potential use of MMS. Identifying an entry point requires undertaking a careful examination of the national landscape either before or as a part of the activities of Phase I identified above, but before embarking on introduction and eventual large-scale implementation. Examples of how two countries (Indonesia and Bangladesh) have begun to implement MMS are presented in the case studies below, with the Indonesia experience highlighting activities and progress related to policy development and Bangladesh focusing on the creation of a market-based model.

### Case Study 1: Indonesia *Decision to explore MMS use for pregnant women in Indonesia*

In Indonesia there are more than 5.3 million pregnancies each year and an estimated 95.6% of women attend at least one antenatal care visit during their pregnancy (MoH, 2019). The prevalence of anaemia among pregnant women is high (48.9%) and wasting (<-2 z-scores weight-for-length) in children under two years of age is

**Figure 1** Model (roadmap) to national multiple micronutrient supplementation introduction and scaling



11.7% (National Institute of Health and Research and Development, 2019).

The Government of Indonesia currently recommends and procures iron and folic acid (IFA) with 60 mg of elemental iron and 400 µg of folic acid for pregnant women (MoH Indonesia, 2015). The majority (73.2%) of pregnant women receive IFA tablets during antenatal care (National Institute of Health and Research and Development, 2019). However, only 6.9% of them consumed 90 tablets as currently recommended in Indonesia (National Institute of Health and Research and Development, 2019). Plans for research into low adherence to IFA in Indonesia are currently underway to try to understand and address this problem.

In terms of cost-effectiveness, transitioning from IFA to MMS is considered “very cost-effective” in Indonesia according to the World Health Organization (WHO) threshold and has a high return on investment. The transition is expected to avert 925,250 disability-adjusted life years (DALYs) over a 10-year period, prevent the deaths of an additional 8,616 children and yield benefits that are 483 times greater than the costs (Nutrition International, 2019a).

Having considered the conditions laid out by the Task Force, Indonesia made the decision to explore the use of MMS as part of routine antenatal care services and is currently focused on Phase I (preparatory and advisory phase) to create an enabling environment that supports an MMS policy recommendation and the creation of an implementation plan.

#### *Phase I MMS exploratory initiatives*

A key activity in Phase I was undertaking exploratory research initiatives to implement MMS programmes with several district health offices, including Banggai district in central Sulawesi and Probolinggo district in East Java. In Banggai and Probolinggo districts, an international non-

governmental organisation (NGO), Vitamin Angels (VA), is providing a supply of MMS to support a joint partnership between Indonesian universities and the district health office (Hasanuddin University in Banggai district and Airlangga University in Probolinggo) to integrate MMS into its antenatal platform as a replacement for IFA (Steets *et al*, 2020; Sumarmi *et al*, 2014). In addition, the University of Hasanuddin is planning to expand these activities into three new districts and one city in 2020. Engaging in these exploratory initiatives not only supported efforts to raise awareness of MMS among key influencers in Indonesia, but also served to generate local evidence to inform a future policy.

#### *Phase I MMS awareness-raising and advocacy*

Based on national interest and MMS implementation experiences, Hasanuddin University, Airlangga University and VA partnered to co-sponsor a symposium at the Asian Congress of Nutrition (ACN) in Bali, Indonesia in August 2019. The objective of the symposium was to update participants on global MMS policy and the most recent evidence of the benefits of MMS use compared to IFA supplementation. Following the symposium, a two-part technical consultation was conducted to provide participants with an opportunity to: i) seek guidance from international and national experts on maternal health and nutrition strategy to inform Ministry of Health strategy and policy pertaining to MMS use; and ii) explore issues, challenges and opportunities related to immediate access to a standardised United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP) MMS product while local capacity is created to meet long-term demand.

#### *Phase I MMS policy adoption*

To build on the momentum generated during the ACN conference and technical consultations, VA sponsored the Indonesian Institute of Nu-





A community health worker records updates of a pregnant woman's progress during her seventh month of pregnancy in Pasay

trition (IGI) to convene a group of experts in Indonesia in January 2020. The meeting included participants from government, local universities, international and local non-governmental organisations and other key stakeholders. The primary objective of the meeting was to generate consensus regarding the efficacy of MMS that would lead to a recommendation to adopt an MMS policy. Key outputs included consensus regarding the efficacy, safety, cost-effectiveness and affordability of MMS use in Indonesia (Keats et al, 2019; Smith et al, 2017, Bourassa et al, 2019). In addition, it was agreed that there was a need for a formal recommendation that leads to the formation of an MMS policy and that the formation of an Indonesian MMS Task Force was necessary to pursue this effort.

Phase I progress to date in Indonesia includes: i) the creation of an Indonesian MMS Task Force working towards MMS policy formation; ii) the provision of resources to conduct implementation research; and iii) efforts to ensure both a short-term (procured internationally and imported) and long-term (manufactured and procured locally) supply of MMS in Indonesia.

In addition, given the emerging consensus among stakeholders regarding the need to effectively introduce and scale MMS, implementation research strategies that include a preparatory, introduction and scaling phase are being planned for Phase II (Introduction).

## Case Study 2: Bangladesh

### Decision to explore MMS use for pregnant women in Bangladesh

In Bangladesh there are three million pregnancies (UN DESA, 2019) each year and widespread micronutrient deficiencies, with over 40% of women of reproductive age suffering from anaemia and 57% suffering from zinc deficiency (Ara et al, 2019). As a result, Bangladeshi women give birth to small babies; the country has the highest prevalence (28%) of low birth weight children in the world and the under-five wasting prevalence (8.4%) equals the average in low- and middle-income countries (LMICs) (UNICEF & WHO, 2019).

The use of key maternal and newborn health services remains critically low in Bangladesh, with only 37% of all pregnant women attending four antenatal care visits (NIPORT, 2017). On the other hand, compared with many other LMICs, Bangladesh has a dense network of retail pharmacies across the country, which are the preferred first point of contact for most of the population and a familiar entity in community life (Ahmed et al, 2017). Furthermore, at the base of the pyramid, those from the poorest segments together account for a staggering 75% of all pregnant women in Bangladesh. With a per capita daily household income between USD 0.50 and USD 2.50, these women purchase medicines and supplements from neighbourhood pharmacies. It is therefore important to ensure that a powerful and comprehensive solution such as MMS is available in these stores through a market-based model.

A transition from IFA to MMS is considered to be very cost-effective in Bangladesh, averting 1,268,067 disability-adjusted life years (DALYs) over a 10-year period, preventing the deaths of an additional 12,640 children and yielding benefits that are 294 times greater than the costs (Nutrition International, 2019b).

Based on these factors, the Government of Bangladesh made the decision to undergo an effort to strengthen its antenatal care system, including exploring the distribution of MMS to ultra-poor women through a demonstration pilot supported by the United Nations Children's Fund (UNICEF), the Bill and Melinda Gates Foundation, *Sight and Life*, and local partners such as International Centre for Diarrhoeal Disease Research, Bangladesh. To complement this systems-strengthening approach, stakeholders in Bangladesh are also supporting a market-based model to ensure sustainable demand and supply of MMS, described in more detail below.

### Phase I: Stakeholder alignment and policy adoption

The Children's Investment Fund Foundation (CIFF), a philanthropic organisation that focuses on improving children's lives, has assembled a consortium of stakeholders to sustainably shape

the market for affordable and accessible MMS in Bangladesh. This consortium includes a social enterprise partner, Social Marketing Company (SMC), which has a large nationwide network of franchisee pharmacies catering predominantly to base-of-the-pyramid consumers; *Sight and Life*, a global nutrition knowledge organisation with expertise building social business models; and the Global Alliance for Improved Nutrition (GAIN), an international non-governmental organisation.

To facilitate the exchange of information and experience on the use of MMS in these two ongoing programmes (demonstration pilot and market-based model), a national-level technical advisory group (TAG) has been set up. The TAG, convened by the Institute of Public Health Nutrition under the Ministry of Health and Family Welfare, is aligning the efforts of all key stakeholders and will play an important role in harmonising standards and facilitating the inclusion of MMS in Bangladesh's essential medicines list and national standard treatment guidelines.

### Phase II: Ensuring sustainable demand and supply of MMS using a market-based model

The consortium assembled by CIFF will help shape the market for MMS in Bangladesh. The goal of the market-based model is to get high-quality MMS (**product**) to pregnant women in Bangladesh at the right **price**, with effective **promotion** and the correct **place** or channel of distribution, while creating the right **policy** environment.

**Product:** Bangladesh has a vibrant pharmaceutical market and several brands of prenatal multiple micronutrients are already available in the market. However, none of them match the UNIMMAP formulation and most have a lower number or lower dosage of critical micronutrients. The consortium successfully enlisted a local pharmaceutical company to develop the UNIMMAP formulation of MMS; a first batch has been manufactured, undergone lab and stability testing, and is currently going through independent quality checks. Based on market surveys and assessment of consumer preferences conducted by SMC and *Sight and Life*, the product will be packaged in blister packs of 10 tablets per strip and 5 strips per box.

**Price:** Based on the market analysis and product benchmarking conducted by *Sight and Life*, the price of current MMS brands (not UNIMMAP-conformant) in Bangladesh ranges from USD 1.80 to USD 2.10 for a pack of 30-50 tablets. The consortium has successfully negotiated a lower price than the current market price for the same pack size, while adhering to the UNIMMAP formulation and ensuring that no actor in the value chain will incur a loss. Moreover, Bangladesh has a favourable regulatory environment for local companies to produce MMS affordably. The Bangladesh Drug Administration has set a price ceiling on finished supplements, a low import duty of 5% on the ingredients, and a prohibitively high import duty on finished supplements from foreign companies.

Thus, the local pharmaceutical sector is well positioned to bring high-quality MMS directly to consumers.

**Place:** There are more than 200,000 pharmacies in Bangladesh, 81% of which are in rural areas. They are so common that two or three pharmacies can be found in every village market, more than 70 in major urban centres, and often thousands in a big city such as Dhaka. SMC operates a 12,000-strong social franchising network of community-level private medical practitioners and pharmacists who offer affordable public health products and services, including medicines. During stage one (2020-2021) of the market-based model, MMS will be available in all 12,000 pharmacies. During stage two (2022-2025), distribution will be expanded to cover the entire 200,000-strong pharmacy network in the country.

**Promotion:** To create awareness and demand for MMS, an intensive and integrated social marketing campaign will be implemented which

will include: i) demand-creation for consumers and their key influencers; ii) demand-creation with health providers; and iii) creation of a digital interface with consumers to monitor adherence and uptake.

### Phase III: Scaling and impact

The market-based model will be fully operational in 2021 and it is envisioned that a total of 3.5 million pregnant women in Bangladesh will have accessed an affordable and high-quality MMS product by 2025. With the forecasted sales through a sustainable and locally owned, market-based model and the consequent reduction in low birth weight, an estimated 77,000 Bangladeshi children will be born healthy every year and have the opportunity to reach their full potential.

### Conclusion

Given recent evidence, the use of MMS in pregnancy should be seriously considered, especially

in regions of the world where the prevalence of wasting is high at birth and micronutrient deficiencies are common among women of reproductive age. In the context of the COVID-19 pandemic and its associated negative impacts on the economy, food access and health services, the risk of maternal and child mortality is sharply increasing due to conditions such as maternal micronutrient deficiency and early child wasting (Fore et al, 2020; Headey et al, 2020–; Headey & Ruel, 2020; Roberton et al, 2020;). MMS is a potential solution for mitigating these risks, as acknowledged by the international nutrition community (UNICEF et al, 2020; Multiple Micronutrient Supplementation in Pregnancy: Technical Advisory Group, 2020). Indonesia and Bangladesh provide examples of how to initiate and accelerate the use of MMS in two different contexts in Asia.

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# Concordance between weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC) for the detection of wasting among children in Bangladesh host communities

By Md. Lalan Miah, Dr. Md. Khalilur Rahman, Dr. Md. Abdul Alim and Bijoy Sarker



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A community nutrition volunteer screens a child at Moheskhali, Bangladesh

Action Against Hunger

## BANGLADESH

**What we know:** There is poor concordance between children identified as wasted using weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC). MUAC only programming is recommended in Bangladesh community-based management guidelines.

**What this article adds:** A secondary data analysis explored the concordance between WHZ and MUAC to identify wasting in 12 districts of Bangladesh and the impact of different MUAC thresholds to capture low WHZ children. Analysis found poor and varied concordance between the two indicators with WHZ identifying the highest proportion of wasted children. Greater MUAC thresholds increased the proportions of severely and moderately wasted cases identified but also led to greater 'false positives' (children not meeting WHZ nor MUAC criteria). Expanded MUAC criteria  $\geq 115$  mm misclassified a proportion of severe acute malnutrition (SAM) cases (WHZ  $< -3$ ) as eligible for moderate treatment. This has implications for the capacity and resources of existing programmes and reinforces questions regarding outcomes of low WHZ children excluded or under-treated by MUAC only programming.

### Context

Both weight for height z-score (WHZ) and mid-upper arm circumference (MUAC) are recommended by the World Health Organization (WHO) as independent indicators of wasting in children (WHO 2009; WHO 2013). In practice, MUAC is increasingly used as a stand-alone anthropometric criterion,<sup>1</sup> such as for community-based screenings, at remote clinics where height/length boards and weighing scales may not be available and as a temporary programming adaptation to COVID-19 where Infection Protection Control (IPC) measures cannot be assured (UNICEF, WHO 2020). MUAC and WHZ often identify different children, with the degree of overlap varying greatly by context (Grellety et al, 2016). While MUAC has long been considered as a better indicator of risk of death than WHZ (Briend et al, 2016), recent analyses suggest that children

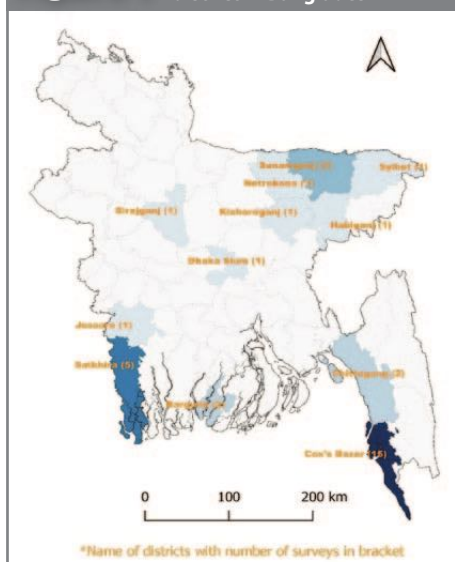
with low WHZ and low MUAC have a similar risk of dying (Schwinger et al, 2019; Grellety and Golden, 2018a and 2018b). Thus, there remain questions regarding the outcomes of low WHZ children that are not identified in MUAC only strategies, especially in contexts where concordance between WHZ and MUAC is poor and how to manage this, such as increasing the MUAC threshold to capture low WHZ children.

In Bangladesh, there are two national guidelines for the management of wasted children: i) facility-based management of children with severe acute malnutrition (SAM)<sup>2</sup> and ii) community-based management of acute malnutrition (CMAM). The facility-based SAM guideline rec-

<sup>1</sup> Or presence of bilateral pitting oedema

<sup>2</sup> The terms acute malnutrition and wasting are used interchangeably in this article in keeping with terminology used nationally.

**Figure 1** Profile of SMART surveys by district in Bangladesh



ommends the admission and treatment of wasted children by WHZ/weight-for-length (WLZ) and/or MUAC as per WHO guidelines (WHZ/WLZ <-3SD and/or MUAC <115 mm and/or bilateral pitting oedema including medical complications) (IPHN, MOHFW, 2017). The national CMAM guideline, covering the management of uncomplicated SAM, moderate acute malnutrition (MAM) and acutely malnourished pregnant and lactating women, recommends admission and treatment using the MUAC only criterion (IPHN, MOHFW, 2017).

Given the above, Action Against Hunger (ACF) undertook an in-depth analysis of anthropometric data from multiple surveys across different regions of Bangladesh to investigate concordance between WHZ and MUAC in the detection of wasting to help decision-making with regards to CMAM programming in the Bangladesh national context.

**Research objectives**

After the recent publication of a similar analysis based on a large set of surveys across multiple

**Table 1** Number of surveys and children included by district and concordance of wasting case detection (GAM and SAM) by WHZ only, MUAC only and both WHZ and MUAC

District	No. Surveys	No. Children	Total GAM cases	GAM			Total SAM cases	SAM		
				WHZ-only (%)	MUAC-only (%)	WHZ & MUAC-both (%)		WHZ-only (%)	MUAC-only (%)	WHZ & MUAC-both (%)
Barguna	2	546	84	67.8%	14.3%	17.9%	11	72.7%	18.2%	9.1%
*Chittagong	2	1,11	121	62.8%	16.5%	20.7%	13	69.2%	30.8%	0.0%
Cox's Bazar	15	8,374	1,297	56.7%	17.7%	25.6%	217	59.9%	20.3%	19.8%
*Dhaka	1	248	24	70.8%	12.5%	16.7%	4	75.0%	25.0%	0.0%
Habiganj	1	451	63	68.2%	4.8%	27.0%	3	100.0%	0.0%	0.0%
*Kishoreganj	1	394	37	40.5%	35.1%	24.3%	2	0.0%	100.0%	0.0%
*Netrokona	1	396	44	40.9%	40.9%	18.2%	5	40.0%	60.0%	0.0%
*Satkhira	5	2,626	347	87.0%	4.6%	8.4%	47	93.6%	0.0%	6.4%
*Satkhira Jessore	1	383	45	88.9%	2.2%	8.9%	4	100.0%	0.0%	0.0%
*Sirajganj	1	208	30	83.3%	10.0%	6.7%	3	100.0%	0.0%	0.0%
Sunamganj	3	1,356	189	60.3%	15.3%	24.3%	30	53.3%	26.7%	20.0%
*Sylhet	1	427	68	70.6%	13.2%	16.2%	14	64.3%	28.6%	7.1%
ALL	34	16,519	2,349	63.5%	15.1%	21.4%	353	65.4%	19.3%	15.3%

*GAM by WHZ only (WHZ <-2 SD and MUAC ≥ 125 mm);  
 GAM by MUAC only (MUAC <125 mm and WHZ ≥ -2 SD);  
 GAM WHZ & MUAC both (WHZ <-2SD and MUAC <125 mm)  
 SAM by WHZ only (WHZ <-3 SD and MUAC ≥ 115 mm);  
 SAM by MUAC only (MUAC <115 mm and WHZ ≥ -3 SD);  
 SAM by WHZ & MUAC both (WHZ <-3 SD and MUAC <115 mm)*

\* This data is not representative of the entire district.

countries, including Bangladesh (Guesdon et al, 2020),<sup>3</sup> the main objective of this study was to explore the concordance of wasting between WHZ and MUAC in Bangladeshi children to inform policy and programming. In addition, the analysis explored the effect of increasing MUAC referral and admission cut-offs on the concordance between low MUAC and low WHZ/WLZ and the implications for the number of expected admissions to outpatient therapeutic feeding programmes (OTP) (severe wasting without medical complications) or to targeted supplementary feeding programmes (TSFP) (moderate wasting).

**Methodology**

Data were drawn from population representative SMART surveys on the nutritional status of

Bangladeshi children aged 6-59 months conducted by Action Against Hunger (ACF) Bangladesh between 2009 and 2020. A total of 34 SMART surveys across 12 districts of Bangladesh (Figure 1) rated either “excellent” or “good” quality and with an acceptable standard deviation for WHZ (standard deviation between 0.80 and 1.20)<sup>3</sup> were retained for analysis. Two SMART surveys with the Emergency Nutrition Assessment (ENA) plausibility score “acceptable” were excluded. Individual child observations missing MUAC, WHZ, or oedema data (n=342), children with WHZ with outliers based on World Health Organization (WHO) flags (±5 SD, n=10), extreme MUAC (n=3) and children with bilateral pitting oedema (n=1) were excluded from the analysis.<sup>4</sup> In total, the pooled sample for analysis consisted of 16,519 children 6-59 months.

A limitation of the study was that data was drawn from a limited number of districts, surveys were often small-scale and infrequently representative of the entire district and were conducted during different seasons of the year. Furthermore, the final sample was not weighted, so larger samples had a stronger influence on the pooled results.

**Results**

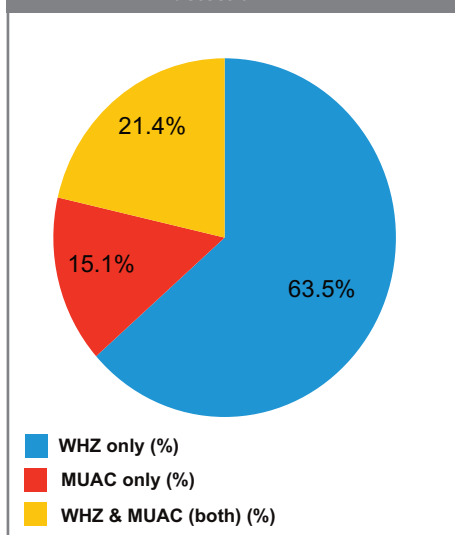
The final analyses included 16,519 children aged 6 to 59 months of which 2,349 cases of wasting (1,996 MAM and 353 SAM) were identified by WHZ and/or MUAC.<sup>5</sup> Table 1 shows the concordance of wasting prevalence by WHZ only, by MUAC only and by both WHZ and MUAC.

<sup>3</sup> as per the Emergency Nutrition Assessment (ENA) plausibility score

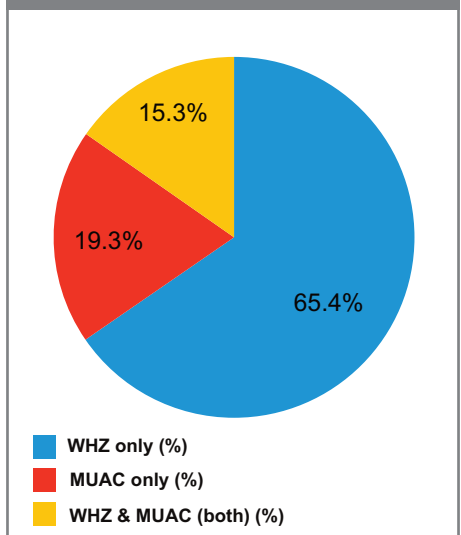
<sup>4</sup> Due to the physiological effects of oedema causing retention of fluid in the body, weight data was not considered for children with nutritional oedema.

<sup>5</sup> Prevalence could not be calculated given that this is a pooled analysis across different years.

**Figure 2** Concordance between WHZ and MUAC for GAM case detection

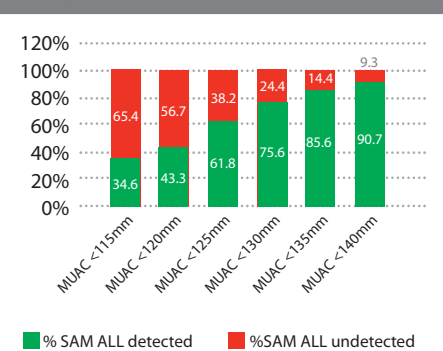


**Figure 3** Concordance between WHZ and MUAC for SAM case detection



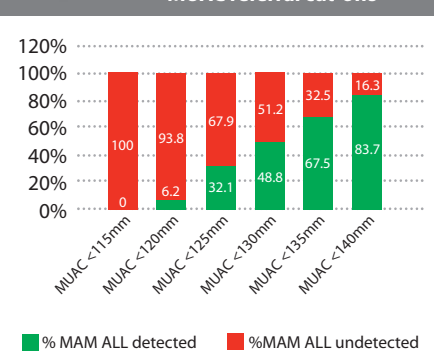


**Figure 4** Projection of SAM case detection based different MUAC referral cut-offs



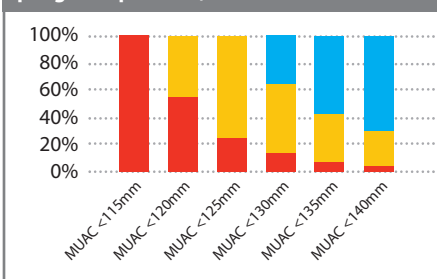
"SAM ALL detected" refers to all cases of SAM by WHZ (<-3 SD) and/or MUAC (<115 mm). "SAM ALL undetected" refers to those children who are SAM (WHZ <-3 SD) by WHZ with a MUAC above the cut-off used for screening.

**Figure 5** Projection of MAM case detection based different MUAC referral cut-offs



"MAM ALL detected" refers to all cases of MAM by WHZ (-3 SD ≤ WHZ <-2 SD) and/or MUAC (115 mm ≤ MUAC < 125 mm) and not SAM by any indicator. "MAM ALL undetected" refers to those children who are MAM (-3 SD ≤ WHZ <-2 SD) by WHZ with a MUAC above the cut-off used for screening.

**Figure 6** Proportion of children eligible for SAM and MAM programmes including false positives from different MUAC referral cut-offs (based on both MUAC and WHZ treatment eligibility as per global protocol)



\*False positive cases are those children whose MUAC ≥125mm and WHZ ≥ -2 based on global threshold for wasting.

According to the all-district pooled analysis (Figures 2 and 3), it was estimated that overall 63.5% of GAM and 65.4% of SAM cases were identified by WHZ only; 15.1% of GAM and 19.3% of SAM cases were identified by MUAC only and 21.4% of GAM and 15.3% of SAM cases were identified by both WHZ and MUAC.

Among all surveyed districts (Table 1), the highest concordance for GAM was observed in Habiganj (27.0%) and Cox's Bazar (25.6%). The lowest concordance for GAM was observed in Sirajganj (6.7%) and Satkhira (8.4%) districts. The highest concordance for SAM was observed in Sunamganj (20.0%) and Cox's Bazar (19.8%). In three district samples, all SAM cases were identified by either WHZ or MUAC (no cases identified by both). In three district samples, all SAM cases were identified by WHZ alone. These findings indicate poor and varied concordance between the two indicators with WHZ identifying the highest proportion of wasted children.

Data was further analysed to project different scenarios of SAM and MAM case detection (Figures 4 and 5) and admission eligibility (Figure 6) for OTP and TSFP programmes based on different MUAC cut-offs. Figure 4 shows that, based on the global reference criteria for SAM (WHZ <-3 SD and/or MUAC <115 mm) and MAM (-3 SD ≤ WHZ <-2 SD or 115 mm ≤ MUAC < 125 mm), a standalone MUAC only referral cut-off of

<115mm would be able to detect 34.6% of total SAM (by both MUAC and WHZ). A standalone MUAC only referral cut-off of <125 mm would be able to identify only 32.1% of total MAM (by both MUAC and WHZ) of the all-district pooled sample. Increasing the standalone MUAC only referral cut-offs further increases both SAM and MAM case detection (by both MUAC and WHZ); for example, a MUAC of <140 mm would capture 83.7% of MAM cases (by MUAC and/or WHZ criteria for MAM).

As the aim of the expanded thresholds is to try to capture children with low WHZ not detected using standard MUAC cut-offs, we defined cases that met the increased MUAC cut-off criteria but did not meet the WHZ criteria as 'false positives'. There are practical consequences of false positive cases. Children may be referred from the community based on MUAC screening but considered nourished in a nutrition facility if re-assessed using WHZ and returned home. This may undermine the screening strategy. In the absence of WHZ verification at facility-level, the nutrition status of MUAC referred children would not be verified and hence admitted for treatment. This has wide implications for programme capacity and resources.

Figure 6 shows the proportion of children eligible for SAM and MAM programmes in-

cluding false positives based on different referral cut-offs. Among all referred cases with an expanded MUAC cut-off of <120 mm, 55% children met admission eligibility for the SAM programme and 45% for the MAM programme as per the global thresholds for MUAC and WHZ. However, the analysis estimates that increasing MUAC referral cut-offs from <125 mm to <130 mm, for example, would lead to 36% false positives (those with a MUAC ≥ 125 mm and WHZ ≥ -2 SD) who would not meet admission eligibility for the SAM and MAM programmes. The percentage of false positives would increase to 70% with a raised MUAC referral cut-off of <140 mm (Figure 6).

The expanded MUAC only admission criteria were also applied to different scenarios to understand the programmatic implications (Figures 7 and 8). The implication of the expanded MUAC only programming is the misclassification of a number of MAM cases as eligible for OTP admission. Scenario 2 in Figure 7 shows that an expanded MUAC only admission criteria with a raised cut-off of <120 mm will lead to the admission of 45% of MAM children to OTP (115 mm ≤ MUAC < 120 mm and/or -3 SD ≤ WHZ <-2 SD). A raised MUAC cut-off of <125 mm for OTP admission will lead to the OTP caseload consisting of 75% MAM children (those with 115 mm ≤ MUAC < 125 mm and/or -3 SD ≤ WHZ <-2 SD).

For TSFP, the expanded MUAC only admission also has programmatic implications with the misclassification of a number of SAM cases as eligible for TSFP (those with a WHZ <-3SD and a MUAC ≥115 mm), and with a large proportion of false positives included when the admission cut-off exceeds 125 mm (Figure 8). This will further inflate the caseload, as many well-nourished children will be enrolled into the TSFP programme due to the expanded MUAC admission criteria.

**Discussion and Conclusion**

Discordance between wasting prevalence as identified by WHZ and MUAC among children 6-59 months is well documented in the literature



A project officer carries out growth monitoring at Teknaf, Bangladesh

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(Grellety, 2016 and Bilukha, 2018). This is confirmed by the present analysis in 12 districts of Bangladesh where the majority of children were wasted by WHZ only compared to MUAC only or by both criteria. Using only one indicator of wasting (MUAC only or WHZ only) for the diagnosis and treatment of wasting will result in a significant proportion of malnourished children being undetected and excluded from treatment. For Bangladesh, this analysis indicates that more than 60% of wasted cases (wasted by WHZ only: GAM 63.5%; SAM 65.4%) would not be detected using MUAC-only diagnostic criterion in CMAM programme. In other words, more than three of every five cases of wasting were excluded when WHZ was not considered as a diagnostic criterion.

In countries where screening and admission is conducted exclusively using MUAC and the concordance of wasting between WHZ and MUAC is poor, the overall cut-off for referral has sometimes been raised in an effort to capture more GAM by WHZ cases. This study demonstrates that the higher a MUAC cut-off is raised, the greater the number of wasting cases by WHZ will be detected. However, this has side effects of including non-wasted children and MAM children in SAM treatment programmes. These increased referrals have the potential to overload treatment centre capacity and accelerate opportunity cost in terms of availability of resources due to providing SAM treatment to MAM children.

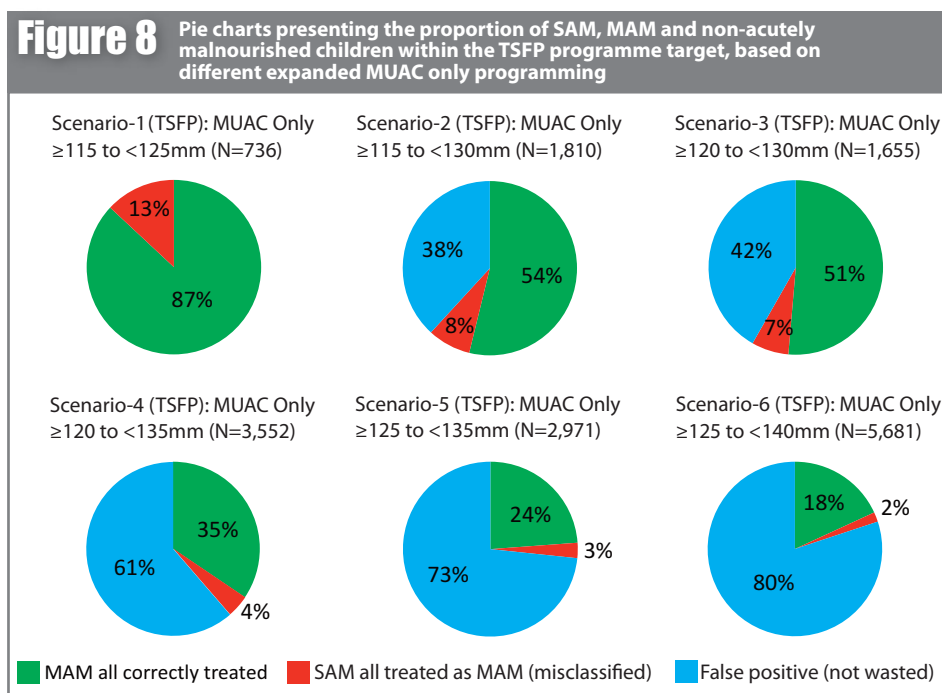
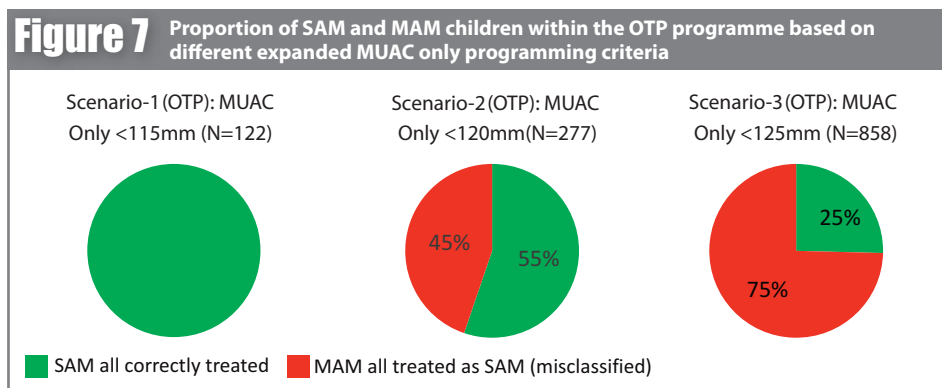
The present study explored different scenarios to understand the allocation of SAM and MAM cases into OTP and TSFP programmes based on different expanded MUAC only programming where WHZ is not measured (due to national protocol) or not possible (as in COVID-19 in some contexts where Infection Protection Control (IPC) standards cannot be met). If an expanded MUAC threshold for screening is applied, the threshold must be carefully selected considering the proportion of misclassification and false positive cases introduced by expanded MUAC only cut-offs. This requires a thorough in-country consultation, capacity gap assessment and informed decision-making that takes into account the capacity of health and nutrition service centres (staff, supplies and other resources) to ensure that they are not overburdened. The ab-

sence of WHZ as a detection and verification method excludes a large proportion of wasted children from treatment or risks overloading treatment capacity with a high proportion of false positive cases if higher MUAC cut-offs are used. This reinforces questions regarding outcomes of low WHZ children excluded by MUAC only programming.

In Bangladesh, the national CMAM guideline recommends use of MUAC as the sole anthropometric criterion to identify SAM for admission to outpatient sites across the country. This may

reflect that MUAC has practical advantages in terms of community screening and a lack of data on discordance between WHZ and MUAC when the national CMAM guideline was developed in 2017. Given this, we hope this analysis can help to provide updated information and understanding around the technical issues around the poor concordance between WHZ and MUAC in Bangladesh specifically.

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## Effectiveness of programme approaches to improve the coverage of maternal nutrition interventions in South Asia

Research summary<sup>1</sup>

### BANGLADESH, INDIA, NEPAL, AND PAKISTAN

**What we know:** Coverage of evidence-based maternal nutrition interventions, critical to reduce wasting in South Asian children, is poor.

**What this article adds:** A systematic review, which included nine studies, was conducted to identify drivers and barriers to the coverage of maternal nutrition interventions and examine actions to improve coverage. Women were more likely to receive and consume iron-folic acid (IFA) and calcium supplements when they had early and more frequent ante-natal care (ANC) visits, higher maternal education, higher paternal education, higher maternal knowledge, increased household wealth, access to counselling services and a higher level of support from husbands. Intervention coverage was improved when programmes used formative research, engaged with and enlisted the support of influential family members, introduced home visits and community forums, and developed the capacity of frontline workers. More evidence is needed to better understand the pathways, enablers and barriers to improved access to maternal nutrition interventions.

**T**he nutritional status of women before and during pregnancy and after delivery has far-reaching consequences for maternal health and child survival, growth and development. Women who are short, thin and anaemic or who gain inadequate weight during pregnancy are more likely to suffer adverse birth outcomes, including low birth weight (LBW) and preterm delivery. Severe anaemia and calcium deficiency, two leading causes of maternal death globally, increase the risk of postpartum haemorrhage and hypertensive disorders respectively. Progress in improving women's nutrition in South Asia has been made; over the last 15 years, low stature (<145 cm) in women of reproductive age has declined by at least 20% in three out of four countries with available data, and low body mass index (BMI; <18.5 kg/m<sup>2</sup>) has fallen by at least 30% in all four countries. However, progress is not swift enough as around one in 10 women in South Asia still have a low stature and one in five still have a low BMI.

Given the close links between maternal and child nutrition, efforts to improve the nutritional status of women are critical to attaining the global nutrition targets of the Sustainable Development Goals and the World Health Assembly and in unleashing the developmental potential of children and the economic development of South Asian nations. In 2016, the World Health Organization (WHO) released guidelines on improving antenatal care (ANC) for women, including a comprehensive set of recommendations on nutrition interventions during pregnancy. In light of the poor maternal nutrition indicators in South Asia and poor coverage of evidence-based interventions, a systematic review (2000-2017) was conducted to identify drivers and barriers to the coverage of maternal nutrition interventions and examine the evidence

on the effectiveness of programme approaches and actions to improve coverage.

The search strategy selected nine studies, conducted in Bangladesh (two), India (five), Nepal (one), and Pakistan (one). Outcomes included the receipt and consumption of iron and folic acid (IFA) and calcium supplements and the receipt of information on dietary intake during pregnancy. Supplementation with multiple micronutrients was not included as it is not a recommended nutrition intervention in the WHO (2016) guidelines on ANC.<sup>2</sup> Data were synthesised by type of maternal nutrition intervention and type of barrier to coverage or adherence to the intervention.

Findings indicate that a range of barriers acting at the individual (maternal), household and health-service delivery level affect whether a woman receives maternal nutrition interventions and, in the case micronutrient supplementation, whether she consumes the supplements. Programme approaches that were effective in increasing the receipt of services and/or consumption of supplements used a combination of actions to address barriers at multiple levels. Predictors of the receipt and consumption of IFA and calcium supplements in Bangladesh, India and Pakistan included early and more frequent ANC visits, higher maternal education, higher paternal education, higher maternal knowledge, increased household wealth, access to counselling services and a higher level of support from husbands. These enablers confirm previous findings on IFA supplementation that point to the role of women's knowledge and empowerment, household resources, women's access to health services and the quality of health services in determining whether women receive and consume supplements and adopt positive dietary practices. All programmes that delivered infor-

mation and counselling to women and their family members, often in combination with other programme actions, significantly improved the receipt and consumption of IFA and calcium supplements and the receipt of information on a diverse diet during pregnancy.

Programme approaches that were effective in improving intervention coverage addressed barriers at multiple levels and had several common features. First, they used formative research and ethnography to adapt the design of programme actions to the context-relevant barriers faced by women in accessing services or adopting recommended nutrition behaviours. This included the design of locally relevant information and counselling materials. Second, they engaged with and enlisted the support of influential family members, including husbands and mothers-in-law, to ensure pregnant women accessed services and adopted positive behaviours, thereby countering women's low decision-making authority. Third, they introduced home visits and community forums to increase the access of pregnant women, influential family members and other community leaders to interventions. Fourth, they developed the capacity of frontline workers to provide information and counselling to women, family members and other community members (and, in Bangladesh, added mechanisms to supervise, monitor and motivate their performance).

The two programmes that examined the effectiveness of mobile health applications to improve service delivery by frontline workers were not effective in increasing the receipt or consumption of IFA supplies. It is likely that mobile health approaches alone will not be effective if other barriers to receipt or consumption of IFA, such as a lack of IFA supplies, are not addressed.

The evidence base on what works to improve the coverage of maternal nutrition interventions in South Asia is very small. Greater attention is needed in all country settings in South Asia on resourcing and conducting formative and implementation research to better understand the pathways, enablers and barriers to improving the access to all maternal nutrition interventions recommended by the WHO ANC guidelines (2016), including the quality of counselling and adoption of positive maternal nutrition behaviours.

<sup>1</sup> Goudet S, Murira Z, Torlesse H, Hatchard J, Busch-Hallen J. Effectiveness of programme approaches to improve the coverage of maternal nutrition interventions in South Asia. *Matern Child Nutr.* 2018;14(54): e12699. <https://doi.org/10.1111/mcn.12699>

<sup>2</sup> See research article in this issue 'Prevention of child wasting in Asia: Possible role for multiple micronutrient supplementation in pregnancy'

# The link between foetal and childhood nutrition and adult non-communicable disease: lessons from birth cohort studies in India

Research summary<sup>1</sup>



A mother and new born at Baria District Hospital, Gujarat

## INDIA

**What we know:** Non-communicable diseases (NCDs) are rising in prevalence globally and they particularly affect younger and thinner people in South Asia, most likely due to poor early life nutrition.

**What this article adds:** Several cohort studies in India over the past 20 years have provided evidence of the links between early life nutrition and the risk of NCDs in adulthood. Birth cohorts have established links between prenatal undernutrition (often defined by low birth weight (LBW)) and later life obesity, diabetes and cardiovascular disease. Risks are especially high in babies who are born small and then gain weight in childhood, even if they do not become overweight or obese. Mothers with gestational diabetes, malnutrition (both over- and under-nutrition), a heavier physical workload, low intakes of micronutrient-rich food such as green leafy vegetables, dairy products and fruit and deficiencies in folate, vitamin C and B12 are all at higher risk of having LBW babies. More evidence on effective interventions to break this cycle is needed; interventions targeting adolescents to improve their nutritional status before they become pregnant may be effective.

## Introduction

Cardiovascular disease (CVD) is the leading cause of death in India. Since the 1960s, the prevalence of CVD in India has been rising sharply, where it is more deadly and affects younger and thinner adults than in other parts of the world. Although obesity, a major risk factor for CVD, is not as high in India as in other parts of the world, its prevalence there is rising and other non-communicable diseases (NCDs) such as hypertension, type 2 diabetes (T2DM) and dyslipidaemia are common. Elucidating the reason behind this higher and deadly prevalence of NCDs in India is of huge public health importance.

Several Indian cohort studies have taken place over the past 20 years which have helped shine light on the causes of adult NCDs, most notably the influence of prenatal and early life nutrition. Since Barker's "foetal programming hypothesis" in the 1970s and the subsequent creation of the developmental origins of health and disease (DOHaD) concept, Indian researchers were quick to recognise the potential

relevance of these ideas to India's NCD epidemic. This article provides a summary of some influential Indian cohort studies and their programme and policy implications for Southeast Asia.

## Prenatal nutrition and adult health

A number of birth cohorts in India have found an association between prenatal nutritional environment and risk factors for non-communicable diseases (NCDs). Low birth weight (LBW) is used as the indicator for sub-optimal foetal nutrition; Bavdekar et al., (1990) found lower birth weight in a cohort of children in Pune to be associated with higher blood pressure, higher plasma glucose and cholesterol concentrations, insulin resistance and central adiposity in childhood. They found the highest risk was in children who had "caught up" and become heavier than average by eight years of age. Rapid weight gain, or "starting small and becoming big" is now a well-established risk factor for later cardio-metabolic disease. Further follow-up of the Pune cohort at 21 years found similar results (Joshi 2014).

Another study, which used hospital birth records since 1934 in Mysore and tracked the adults by house-to-house survey in order to assess long-term outcomes, found similar results (Krishna 2015). As well as an association between LBW and a higher risk of cardiovascular disease (CVD), it also found something new: babies who were fatter at birth, or those with larger mothers, had a greater risk of developing type 2 diabetes (T2DM). Based on evidence from other studies that foetal exposure to gestational diabetes increases risk of later life T2DM, this likely explains these results. Gestational diabetes affects up to 20% of urban Indian women so breaking this intergenerational cycle is imperative for improving population health.

Prospective cohorts including the Pune Maternal Nutrition Study (PMNS) (Rao 2001) and the Parthenon Birth Cohort (Krishnaveni 2015) have also provided further important insights into the connection between prenatal nutrition and later adult health and have identified potentially modifiable risk factors during pregnancy. These studies have identified a particularly risky phenotype which seems to be especially prevalent in south east Asian populations called "thin-fat"; these babies are small in all dimensions and have low levels of fat-free tissue (such as muscle) but normal levels of subcutaneous fat. Hence their fat:muscle ratio is a lot higher than most newborns.

Maternal factors associated with smaller newborn size included smaller body size (pre-pregnant height, body mass index, skin folds and arm circumference), a heavier physical workload, low intakes of micronutrient-rich food such as green leafy vegetables, dairy products and fruit, lower blood levels of vitamin C and folate and higher levels of homocysteine (indicative of vitamin B12 deficiency, present in 70% of mothers). Maternal

<sup>1</sup> Fall, CHD. (2018) Nutrition in Fetal Life and Childhood and Its Linkage with Adult Non-Communicable Disease: Lessons from Birth Cohort Studies in India. Proc Indian Natn Sci Acad 84 No. 4 December 2018 pp. 881-889



vitamin D insufficiency and low vitamin B12 concentrations are associated with lower muscle mass, higher adiposity and higher insulin resistance in their children. Low vitamin B12 in mothers is also a risk factor for gestational diabetes which we know leads to an increased risk of obesity and NCDs for the exposed offspring.

Low B12 concentrations are known to be common in lots of Indian populations and may be an important area for intervention, the main cause being low dietary intake due to a lack of meat, fish, eggs and dairy products. The PMNS cohort has now transitioned into a vitamin B12 intervention study (ongoing) where adolescent cohort members are receiving supplementation and B12 levels and later cardiometabolic outcomes will be assessed in their offspring. If successful, this could have important implications for lifelong health and productivity across Southeast Asia.

Two other intervention studies have also focused on pre-conception nutrition in India. The Mumbai Maternal Nutrition Project (MMNP or "Project SARAS") provided a daily micronutrient-rich snack in order to improve diet quality and this successfully resulted in a 24% reduction in LBW and an almost 50% reduction in gestational diabetes. The other study, "EINSTEIN", started in 2018 as part of the multi-country HeLTI family of studies (Healthy Life Trajectories Initiative), includes multi-faceted interventions (nutrition, sanitation and hygiene, environmental and mental health interventions) in a rural South Indian population (ongoing). Interventions later in pregnancy are unlikely to influence the developmental origins of health and disease (DOHaD) effect since they miss foetal organogenesis and placental development, both of which are thought to play a mediating role in foetal programming.

## Infant and young child nutrition and adult health

Besides prenatal nutrition, nutrition in infancy, childhood and adulthood are also important in relation to non-communicable disease (NCD) risk. Two large Indian cohorts, the New Delhi and Vellore birth cohorts, have shown in greater depth the risk of "small becoming big" (Bhargava 2018; Antonisamy 2009). They have found that adults (average age, 29 years) with type 2 diabetes (T2DM) were generally born smaller and thinner than those who did not develop T2DM, gained weight quickly in late childhood to catch-up

their BMI and then gained further weight in adulthood to exceed the body mass index (BMI) of those without T2DM. Those with T2DM were still thin by international standards but they had gained more weight, more rapidly, than non-T2DM adults in their community.

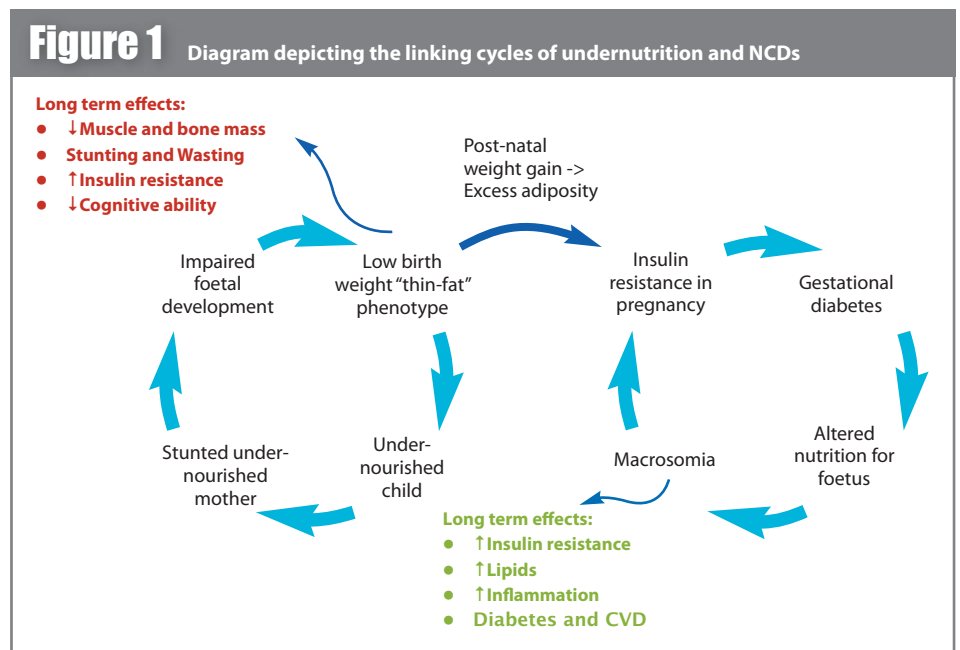
Intervention in this area is not simple. It is undoubtedly important to prevent and treat childhood obesity but this alone will not prevent the majority of future cases of T2DM in India because many Indian children are born small and catch-up. The challenge is in identifying the low birth weight (LBW) children crossing the BMI centile lines; the New Delhi birth cohort group has published centile charts to detect this growth pattern (Sachdev 2009). Even once identified, high-quality intervention studies in Indian children have shown that it is not easy to prevent BMI gain (Bhave 2016). Moreover, preventing BMI gain among children who were under-nourished in utero, and whose BMI remains well below international norms, is questionable. Preventing the low birth weight in the first place is therefore perhaps the more desirable path for intervention.

## Implications for policy and programmes

These studies have taught us that maternal and child nutrition are very important driving

factors for lifelong health and the health of the next generation. In Southeast Asia, this is especially pertinent due to the dangerous combination of very high low birth weight (LBW) rates and transitioning diets. Perhaps due to the severity of foetal undernutrition, it appears to take very little transition and only a subtle increase in childhood adiposity to produce these metabolic changes and subsequent non-communicable diseases (NCDs) in this context which, in turn, leads to problems in the next generation. The cycle of undernutrition, subsequent subtle weight gain and the resultant NCDs is depicted in Figure 1.

Attempts should be made to break these cycles at several points by improving maternal and infant nutrition and preventing child wasting, stunting and excess body mass index gain. Practitioners and policymakers must recognise that newborn and infant underweight is a risk factor for later NCDs, not just overweight. More evidence is needed to understand exactly what interventions work best but, in the meantime, doubling our efforts to prevent and effectively treat childhood wasting and stunting and focusing on good maternal and adolescent nutrition will not only help that individual survive and thrive but may also help the subsequent generation from falling into the same trap.



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# Child wasting and concurrent stunting in low- and middle-income countries

Research summary<sup>1</sup>

**What we know:** Cross-sectional, survey-based estimates fail to capture the dynamics of wasting, particularly the onset, recovery and persistence of wasting. Longitudinal analyses are needed to provide a richer understanding of such dynamics.

**What this article adds:** A pooled analysis of 18 longitudinal cohorts among children aged 0-24 months (10,854 children and 187,215 anthropometry measurements) revealed that, overall, the prevalence of wasting was highest at birth, decreasing from birth to three months and then increasing from three to 12 months of age. In South Asia, wasting prevalence was higher at birth than at 12 months, likely driven by seasonally-influenced maternal undernutrition mediated by low birth weight (LBW). The incidence of wasting was highest in the first three months of life in South Asia, where wasting prevalence estimates may underestimate the number of children who have experienced wasting episodes seven-fold (five-fold globally). While overall the majority (87%) of children recovered from wasting, children from South Asia had lower recovery rates and a more common experience of persistent wasting. By age 24 months, half of children in South Asia experienced at least one wasting episode and 7% were persistently wasted. Concurrent wasting and stunting was also most prevalent in South Asia, with peak prevalence at ages 12-18 months. Results highlight the need to intervene early before the current 6-24 months treatment focus and for seasonally targeted maternal interventions to prevent child wasting.

**A**n estimated 52 million children worldwide are wasted, with over half living in South Asia.<sup>2</sup> Severe wasting can be successfully treated but relapse and mortality are high and prevalence has not decreased in 30 years. A more complete understanding of the epidemiology of wasting is needed to develop targeted treatment and preventative interventions. Unlike the cumulative process of linear growth faltering that leads to stunting, wasting is dynamic and varies over time both within individuals and populations. Cross-sectional, survey-based estimates of wasting fail to capture this dynamic of wasting, particularly the onset, recovery and persistence of wasting. In fact, as many as 13 times the number of children who are wasted at one point in time may experience periods of wasting within a year. Longitudinal analyses are needed to provide a richer understanding of such dynamics.

In this study, the authors conducted a pooled analysis of 18 longitudinal cohorts (10,854 children and 187,215 anthropometry measurements) from 10 low- to middle-income countries in South Asia, sub-Saharan Africa and Latin America that measured length and weight monthly among children aged 0-24 months. Cohorts ranged in size from 215 to 2,920 children. The purpose of the analysis was to estimate wasting incidence and recovery, temporal and regional variations and the concurrence of wasting and stunting. Weight-for-length z-score was used to define wasting, as it was measured in all cohorts.

Across all regions, the highest wasting prevalence was at birth, potentially linked to intrauterine growth restriction or preterm birth, with a pooled prevalence of 11.9% (95% CI: 7.0, 19.5). This is in contrast to previous global research noting that

wasting prevalence peaks in children aged between 6-24 months. In South Asia, where low birthweight is common, wasting prevalence at birth was 18.9% (95% CI: 15.0, 23.7), which indicates the potential role of maternal nutrition or maternal illness as a key driver of wasting in the region.

A consistent pattern was noted in prevalence decreasing from birth to three months and then increasing until 12 months of age. However, in South Asia and Latin America wasting prevalence was higher at birth than at 12 months. Almost half (47.8%) of children who ever experienced wasting during the first two years of life, experienced the first onset in their first three months of life and an estimated 14.8% (95% CI: 9.1, 23.0) of all children experienced wasting by three months of age. These findings highlight the need to intervene early before the current 6-24 month treatment focus.

When exploring the differences between prevalence and incidence figures, after birth a maximum of 7.0% (95% CI: 4.4, 11.0) of children were wasted (prevalence) but 33.3% (95% CI: 21.1, 48.3) of children experienced at least one episode of wasting (incidence) by age 24 months. In South Asian cohorts, the proportion was 50.5% (95% CI: 41.6, 59.3). Incidence at all ages was higher in South Asia, with the highest incidence in the first three months, even when excluding episodes of wasting at birth. Thus, wasting prevalence estimates may underestimate the number of children who have experienced wasting episodes five-fold and, in South Asia, this could be as high as seven-fold.

An exploration of seasonality revealed that average weight-for-length scores varied dramatically by calendar date in almost all cohorts, with the lowest scores noted during peak rainfall seasons. The birth month influenced the effect of the season on weight-for-length trajectories, with the risk re-

maining to the second year of life. In South Asian cohorts, average weight for length scores at birth varied by almost a full standard deviation depending on the month the child was born (range: -0.5 Z to -1.3 Z). This finding suggests that seasonally-influenced maternal nutrition, likely mediated through intrauterine growth restriction or preterm birth, was a major determinant of child wasting at birth.

Ultimately, the majority of children recovered from wasting (91.5% moderate wasting episodes, 82.5% severe wasting episodes). However, compared to other regions, South Asian cohorts had lower recovery rates in the 6-18 month age period. On average, the children born wasted did not catch up to the weight-for-length of children not born wasted and children born wasted who recovered had a higher cumulative incidence of wasting after six months of age. Furthermore, there was a subset of children (3.7%) who experienced persistent wasting.<sup>3</sup> This was highest in South Asia (almost double compared to the overall estimate), with 6.9% (95% CI: 4.7, 10.2) children persistently wasted over the first two years of life.

Concurrent wasting and stunting was most common in South Asia. Fourteen per cent of children were both wasted and stunted during at least one measurement and children ever wasted in the first six months were 1.8 (95% CI: 1.5, 2.3) times more likely to be both wasted and stunted between ages 18-24 months with peak prevalence at ages 12-18 months.

Among anthropometry measurements of wasted children, a large proportion was also classified as underweight (37.9%) or stunted and underweight (39.9%); the highest proportion of only-wasted children occurred at birth (6.2% of all children).

Limitations of the analysis include a lower length-for-age z score in South Asian cohorts (that may lead to overestimates in wasting recovery), inconsistency in the treatment referral data and the age of follow up between cohorts, wasting based on weight-for-height only (MUAC is associated with risk) and no adjustment for gestational age for birth anthropometry.

The authors conclude that these results offer important insights for wasting interventions and, in particular, preventative actions. Seasonally targeted interventions to prevent wasting in food-insecure populations could offer an important solution, particularly in South Asia where at birth variations were noted. Seasonal maternal nutrition interventions could be considered within this region. Extending the current focus of interventions to the 0-6 months old age group could also be essential; however, preventative and therapeutic intervention in this age group must be integrated with current infant and young child feeding practices and recommendations for exclusive breastfeeding.

<sup>1</sup> Mertens, A., et al. (2020). Child wasting and concurrent stunting in low- and middle-income countries medRxiv: 2020.2006.2009.20126979. <https://www.medrxiv.org/content/10.1101/2020.06.09.20126979v1>

<sup>2</sup> Based on old estimates, from World Health Organization Joint child malnutrition estimates – Levels and trends (2019 edition). [www.who.int/nutgrowthdb/estimates2018/en/](http://www.who.int/nutgrowthdb/estimates2018/en/) (2019). More recent estimates are available in the 2020 edition (144 million children globally are stunted).

<sup>3</sup> Persistent wasting was defined as ≥50% of weight-for-length measurements from birth to 24 months falling below -2.



### Growth faltering in early infancy: highlights from a two-day scientific consultation Report summary<sup>1</sup>

**G**rowth faltering among babies less than six months of age remains a significant concern in India which has not so far received adequate attention from a prevention, timely detection and management perspective. A two-day consultation on the subject was thus organised in October 2018 to examine the data and evidence on the identification and management of early growth failure and to identify knowledge gaps and future areas of research. The meeting, organised by the Biotechnology Industry Research Assistance Council, the Indian Academy of Pediatrics, Vardhman Mahavir Medical College and Safdarjung Hospital and the Society for Applied Studies, was held in India. It highlighted both major areas of consensus and areas that require more action and further research.

Discussions around the epidemiology of growth failure in early infancy highlighted that this is an important area due to the high risk of mortality and morbidity in this age group. There is a lack of evidence to reach consensus around the best choice of indicators to use to help with the early identification, management and monitoring of growth faltering in community settings. Studies suggest that weight-for-age z-score (WAZ) may be the best

predictor of mortality among infants less than six months of age, the use of which could operationally simplify community-level assessment. Discussions regarding guidelines and current practices for the management of growth failure in early infancy focused on severe acute malnutrition (SAM) due to its association with a high risk of mortality. However, these guidelines lack evidence on the specific management of very young patients and are poorly implemented in the Indian context. Evidence is needed to foster effective lactation support for young infants and for assessing, where needed, effective and safe alternatives to breastfeeding. The feasibility, impact and cost-effectiveness of community-based management for uncomplicated cases among infants less than six months of age should be explored in trials and tested for the potential to scale up into existing delivery systems.

Optimal breastfeeding practices were identified by the group as central to preventing growth failure among infants less than six months of age. These must be supported by effective counselling services for mothers. Catch-up growth has been shown to reduce mortality and morbidity outcomes in the short term and neurodevelopment in later life. Available evidence points towards the need to pri-

oritise the first two to four months of age as the window of opportunity for maximising catch-up growth in pre-term and small for gestational age babies. The consultation recommended a focus on prevention to promote the survival, growth and development of low birth weight babies, taking into account the importance of the nutrition and health of the mothers. Integrated community-based efforts are needed to tackle underlying causes of undernutrition including early childbearing, poor sanitation, poverty and parental education. A reorganisation of the health system to facilitate the continuum of care from facility births through to follow up at home was recommended, with comprehensive models for the care of small and sick newborns extending beyond the neonatal period required. Models incorporating interventions such as a no separation policy of mothers and newborns and Kangaroo Mother Care with co-delivery of postnatal and early newborn care should be tested for scale up in programme settings.

<sup>1</sup> Aneja S, Kumar P, Choudhary TS, et al. Growth faltering in early infancy: highlights from a two-day scientific consultation. BMC Proc. 2020;14(Suppl 12):12. Published 2020 Sep 15. doi:10.1186/s12919-020-00195-z <https://doi.org/10.1186/s12919-020-00195-z>

## REGIONAL

### Lives upended - how COVID-19 threatens the futures of 600 million South Asian children

Report summary<sup>1</sup>

**T**he lives and futures of children across South Asia are threatened by the COVID-19 crisis. While they may be less susceptible to the virus itself, children are being profoundly affected by the economic and social consequences of 'lockdowns' and other measures taken to counter the pandemic. The knock-on economic and other effects of COVID-19 compromise the hard-won progress in advancing children's rights that South Asia has made in recent decades. With the pandemic expanding rapidly across a region that contains a quarter of the world's population, UNICEF's Lives Upended report describes the disastrous immediate and longer-term consequences that the virus and the measures to curb it have had on 600 million children and the services that they depend on.

In terms of nutrition, the massive loss of jobs and income has made it harder than ever for poorer families to provide nutritious meals for

their children. Rising food prices and scattered disruption to transport links and markets have made the task even more challenging. Even before the arrival of COVID-19, malnutrition was a grim fact of life for children throughout South Asia. Across the region, an estimated 7.7 million children under five years of age suffer from severe wasting and over 56 million – one third of all children in that age group – are stunted. A rise in severe wasting has been noticed, due to both the disruption of services and the fact that caretakers are not seeking treatment – for example, in Bangladesh there was a 90% drop in admissions for severely wasted children between February and a 15% rise in the prevalence of severe wasting over the past one year.

The COVID-19 crisis has exposed critical, longstanding child-related issues in the region, as well as opportunities to respond. To tackle child undernutrition in the region national health

Sukhadi is distributed to the mothers of children between 3-6 years in Himdoloya Kedi Fadia , Gujarat



systems must deliver essential nutrition services alongside cash transfers or other social protection measures to ensure that enough nutritious food in vulnerable families for young children and pregnant or breastfeeding mothers alike.

<sup>1</sup> Simon Ingram. LIVES UPENDED: How COVID-19 threatens the futures of 600 million South Asian children. UNICEF, June 2020

## Report of the South Asia 'Stop stunting: No time to Waste' conference

### Report summary<sup>1</sup>

In May 2017 the first three-day South Asia regional 'Stop Stunting' conference was convened by the South Asian Association for Regional Cooperation (SAARC) and the United Nations Children's Fund (UNICEF) Regional Office for South Asia (ROSA). Entitled No Time to Waste, the conference brought together over 90 government representatives, academics, United Nations partners and civil society organisations from across South Asia to exchange experiences in addressing wasting in the context of broader nutrition programming. The conference aimed to position the care of children with severe wasting as an essential intervention to support optimal nutrition and development in the first years of life in South Asia.

Presentations by country and global actors explored the state of child wasting in the region, sharing best practices and providing insights into potential mechanisms to scale up services for severely wasted children. A key theme emerging from the conference was the need for a transformation in thinking and approaches in

the region, shifting from a focus on stunting towards addressing all forms of undernutrition, including wasting. In response, countries developed visions for the future, outlining key advocacy, policy, programme and research priorities to scale up interventions.

1. Wasting must be addressed with greater urgency across all countries in South Asia.
2. Wasting and stunting reduction should be addressed as two interconnected priorities.
3. Programmes should deliver essential nutrition actions to prevent wasting and stunting and to treat severe wasting when preventative actions fail.
4. Health-system actors have a primary role in delivering actions to prevent wasting and stunting, together with other sectors.
5. Community-based platforms are needed to identify and refer wasted children as early as possible.
6. Community-based care and treatment of wasting is needed to maximise the number of children successfully treated.
7. Inpatient care is essential for severely wasted



8. Therapeutic food should conform to World Health Organization (WHO) specifications and can be produced in most countries.
9. Policies and guidelines on the care and treatment of severe wasting should align with the latest WHO guidelines.
10. Quality programme data are essential to track progress and inform scale-up of programmes

The conference report concludes that, "with children's survival, growth and development at stake, as well the economic prosperity of nations, it is essential that countries across South Asia put these key actions into practice."

<sup>1</sup> <https://www.unicef.org/rosa/stop-stunting-no-time-waste>

## Report of the South Asia 'Stop stunting: Power of Maternal Nutrition' conference

### Report summary<sup>1</sup>

The second regional conference on stunting, held in May 2018, focused on efforts to scale up maternal nutritional care in South Asia. The conference, organised by the Secretariat of the South Asian Association for Regional Cooperation (SAARC) and the United Nations Children's Fund (UNICEF) Regional Office for South Asia (ROSA), together with Nutrition International, brought together 120 participants from across the region to share learnings, analyses, evidence and experiences on the nutritional care of women during pregnancy and postpartum. The conference recognised that, while progress has been made, women's nutritional status in the region is a serious cause for concern, with high rates of underweight, short stature and anaemia being reported, as well as rising rates of overweight and obesity. This is important for child wasting given the strong links between poor maternal nutrition and child wasting in South Asia, mediated through low birth weight (LBW).

The conference aimed to position the nutritional care of women during pregnancy and postpartum as an essential nutrition intervention, share new evidence and guidelines, and identify actions to accelerate improvements in maternal

nutritional care. Country teams identified short and medium-term priorities to strengthen advocacy, policies, programme design, research and knowledge on maternal nutrition.

The conference culminated in a joint 'call to action' being developed to accelerate progress in the nutritional care of women. The 10 key actions which formed the call to action were:

1. National policies and guidelines on maternal nutrition should be in line with evidence-based global recommendations, adapted to the country context.
2. Maternal nutrition should be prioritised in national development agendas and sector plans and budgets.
3. Greater focus is needed to operationalise national policies and plans, particularly at the sub-national level.
4. Service-delivery platforms (particularly community-based platforms and services) should be maximised to reach women.
5. Service-delivery packages should include context-specific interventions according to the prevalence of undernutrition and local context.
6. Evidence-informed social and behaviour-change communication is needed.



7. National health and nutrition information systems and surveys should include maternal nutrition indicators.
8. Implementation research is needed to understand the barriers, enablers and pathways to delivering maternal nutrition interventions at scale and with equity.
9. Investments are required from multiple sectors.
10. Regional leadership and platforms are needed to support country actions and facilitate exchange of knowledge and experience.

It was concluded that strong political leadership, together with actions across multiple sectors, is required to achieve the call to action and to improve the health and wellbeing of women and children in South Asia.

<sup>1</sup> <https://www.unicef.org/rosa/what-we-do/nutrition/adolescent-and-womens-nutrition/stop-stunting-power-maternal-nutrition>





## Report of the South Asia 'Stop stunting: Improving Young Children's Diets' conference

Report summary<sup>1</sup>

The third regional conference on stunting hosted by the Secretariat of the South Asian Association for Regional Cooperation (SAARC) and the United Nations Children's Fund (UNICEF) Regional Office for South Asia (ROSA) was held in September 2019. The conference focused on young children's diets and the importance of complementary feeding. Country representatives together with researchers, UN partners, civil society organisations and other development partners across the region were brought together to exchange regional analyses, share new evidence and experiences, and identify critical actions across key systems of health, food, social protection, and water, sanitation and hygiene (WASH) to improve young children's diets.

The conference also provided an opportunity for participants to input into the draft SAARC regional multi-system action framework for improving young children's diets, as well as devel-

oping country priorities for the improvement of young children's diets in each country's context. Key actions to accelerate progress were subsequently agreed. These included:

1. Position the diets of young children as a priority in national development agendas.
2. A multi-system/multi-sector response involving the health, food, social protection and WASH systems.
3. Purposeful engagement with multiple stakeholders at national and sub-national level.
4. Regularly updated situational analyses (on status, trends and drivers) to inform policies and programmes.
5. Social and behaviour-change communication to improve feeding practices, combined with actions to improve access to affordable, safe and nutritious foods.
6. Utilisation of multiple delivery platforms, including at the community level, to ensure the reach and uptake of interventions.

7. Effective government regulations and policies to protect young children in light of the growing influence of the food and beverage industry.
8. National routine information systems and surveys, including appropriate indicators to inform actions, build accountability and track progress.
9. Implementation research to understand barriers, enablers and pathways to improving children's diets.
10. Regional platforms to support country-level actions and facilitate learning exchange.

A 'call to action' for member states was developed, noting the need for countries to utilise opportunities to improve children's diets in policies, regulatory measures, strategies, plans and budgets. SAARC was called on to support countries in these efforts through advocacy, regional guidance, training packages and support for formative research. The conference concluded with a reflection on the urgency of the need to improve children's diets across the region and a commitment by ROSA and SAARC to work with member countries to support the implementation of the key actions identified.

<sup>1</sup> [www.unicef.org/rosa/sites/unicef.org/rosa/files/2020-06/Stop%20Stunting%202019.pdf](http://www.unicef.org/rosa/sites/unicef.org/rosa/files/2020-06/Stop%20Stunting%202019.pdf)

## Wasting in South Asia: Building the evidence on policy and programme response

A one-day consultation organised by United Nations Children's Fund (UNICEF) was held in New York in 2018 to examine the evidence and guide the direction of future collaborative efforts on wasting in South Asia. The consultation was attended by 32 individuals, including members of the Council of Research and Technical Advice on Acute Malnutrition (CORTASAM), researchers and academics. Participants identified unique characteristics of child wasting in South Asia that need closer exam-

ination, including high wasting prevalence at birth and in the early months of life, lower associated mortality with wasting, persistent wasting, and lower and slower response to treatment. Proposed adaptations of India's national guidelines were seen as an opportunity for learning around the sustainability and cost-effectiveness of alternative models of care for severely wasted children. Participants identified the need for research to inform a greater range of treatment options tailored to the region with potential for greater coverage, quality and

sustainability of care and treatment of severe wasting. Areas of research identified include identifying effective approaches to prevent and manage wasting in the under-six months age group; modifications to the use of ready-to-use therapeutic food (RUTF); use of home-based foods and home-augmented foods to treat severe wasting; and transitioning from treatment foods to family diets. Follow-up actions included formation of a sub-working group of CORTASAM on wasting in South Asia (profiled in this edition of *Field Exchange*) and production of this special edition of *Field Exchange* on child wasting in South Asia.

Read more about this consultation in a news article in *Field Exchange* issue 59, available online at [www.enonline.net/fex/59/wastinginsouthasia](http://www.enonline.net/fex/59/wastinginsouthasia)

## Low birth weight estimates: Levels and trends 2000–2015

The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) have published global low birth weight (LBW) estimates that summarise levels and trends between 2000 and 2015.<sup>1</sup> The report highlights that babies born at a healthy weight are more likely to survive and thrive, while babies born with LBW, defined as weight at birth below 2,500g regardless of gestational age, are more likely to die during their first month of life or face lifelong consequences such as growth failure and lower IQ.

Nearly 15% of all infants worldwide are born with LBW. Almost all of them (95%) are born in

less developed regions, where LBW is primarily caused by poor foetal growth linked to poor maternal nutrition before and during pregnancy. Of the 20.5 million LBW babies born in 2015, more than half were born in Asia. The prevalence of LBW varied widely across regions, from 7.2% in more developed regions to 17.3% in Asia, with variations across sub-regions. In Southern Asia, the prevalence of LBW was 26.4% in 2015 – more than five times higher than the 5.1% prevalence in Eastern Asia. These two sub-regions of Asia had respectively the highest and lowest LBW prevalence of all sub-regions in the world. In other regions, there was greater homogeneity between sub-regions.

Progress in reducing LBW prevalence has stagnated since the year 2000. The annual average rate of reduction (AARR) in LBW was 1.00% per year in the most recent period from 2010 to 2015. An AARR of 2.74% per year between 2012 and 2025 is required to meet the global target of 10.5% LBW prevalence. Because the availability and quality of LBW data vary widely among countries, estimates were derived using a peer-reviewed approach to improve comparability across countries and years. This is the first time such LBW data have been made available globally. The estimates fill a data gap, allow the tracking of progress and support various initiatives that aim to improve newborn survival and growth.

<sup>1</sup> United Nations Children's Fund (UNICEF), World Health Organization. UNICEF-WHO Low birthweight estimates: Levels and trends 2000–2015. Geneva: World Health Organization; 2019 Licence: CC BY-NC-SA 3.0 IGO. <https://www.who.int/nutrition/publications/UNICEF-WHO-lowbirthweight-estimates-2019/en/>

## Improving Maternal Nutrition in South Asia: Implications for Child Wasting Prevention Efforts

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Adolescent girls in Kapilvastu District, Nepal, 2016

### 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/m<sup>2</sup>) and short stature

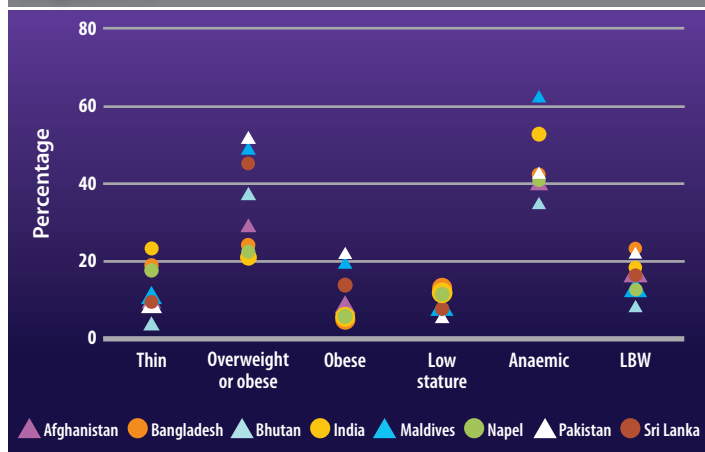
(height <145 cm) has fallen in South Asia. However, thinness still affects one in five women in the region, with Bangladesh and India most affected, and one in ten women in the region have a short stature (Figure 1) (Goudet et al., 2018). In addition, overweight and obesity are rapidly rising concerns 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).

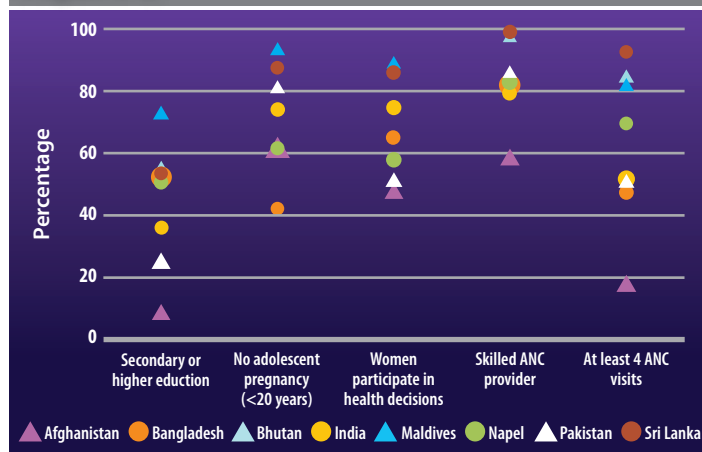
There are other aspects of women's health status and lives that also adversely affect birth weight and child nutrition, including maternal infections (e.g., malaria, rubella, syphilis), low maternal education, adolescent pregnancy and short birth spacing (Kozuki et al., 2013a; Kozuki et al., 2013b; Robinson 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



**Figure 1** Women's nutrition status and low birth weight in South Asia<sup>2</sup>



**Figure 2** Gender equality, empowerment and service utilisation indicators for women in South Asia<sup>3</sup>



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; Bajracharya, 2019), particularly in Afghanistan (20%) and Bangladesh (24%).<sup>1</sup> 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%).

**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)

Category	Recommendation	Countries with policy or guidance
Dietary interventions	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	All except Pakistan
	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.	All except Maldives and Pakistan
	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.	All except Maldives and Pakistan
Iron and folic acid supplements	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.	All countries
	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%.	No countries
Calcium supplements	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.	All except Maldives, Pakistan and Nepal
Vitamin A supplements	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	Nepal only
Restricting caffeine	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.	Afghanistan, Bhutan, Maldives and Nepal

**Response to maternal nutrition in South Asia**

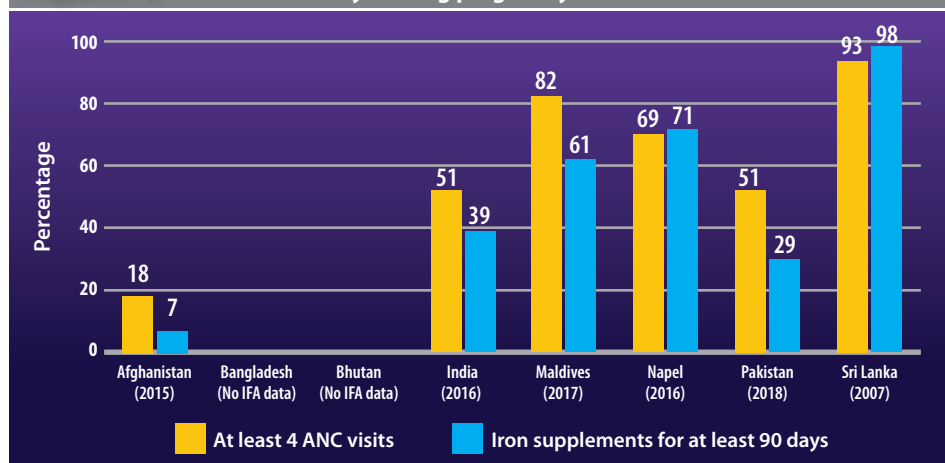
There is progressive recognition by national governments in South Asia of the impact of poor nutrition during the first 1000 days on national development and the costs of inaction (Aguayo & Menon, 2016). This has resulted in the development and implementation of multi-sector strategies and plans to scale 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

<sup>1</sup> Percentage of women aged 20-24 years who gave birth before 18 years. Data available at <https://data.unicef.org/topic/child-health/adolescent-health/>

<sup>2</sup> 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.

<sup>3</sup> 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-4) 2016; Maldives DHS 2016-17; Nepal DHS 2016; Pakistan DHS 2017-18; Sri Lanka DHS 2016.

**Figure 3** Population coverage of at least four ANC visits and iron supplements for at least 90 days during pregnancy in South Asian countries<sup>5</sup>

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*<sup>4</sup> 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

<sup>4</sup> See filed article in this edition entitled "Prevention of child wasting in Asia: Possible role for multiple micronutrient supplementation in pregnancy"

<sup>5</sup> Data sourced from nationally representative surveys: Afghanistan DHS 2015; India National Family and Health Survey (NFHS-4) 2016; Maldives DHS 2016-17; Nepal DHS 2016; Pakistan DHS 2017-18; Sri Lanka DHS 2007.



media and voice over IP platforms. These examples demonstrate the resilience of the primary health-care system in South Asia and some of these adaptations, 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 nutrition 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 populations reaches women. The Mathrupoor-

na ('complete motherhood') programme in Karnataka 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 (Torlesse & 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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# 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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## 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.<sup>1</sup> 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.<sup>2</sup> However, progress has been slow globally and there has only been a modest reduction in the wasting prevalence between 2015 (7.4%)<sup>3</sup> and 2019 (6.9%).<sup>4</sup>

Two thirds (66%) of the world's wasted children – some 30.8 million – live in the Asia and Pacific region.<sup>5</sup> 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.<sup>6</sup>

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

<sup>1</sup> WHO, UNICEF & WFP (2014). *Global Nutrition Targets 2025: Wasting policy brief*. [https://www.who.int/nutrition/publications/globaltargets2025\\_policybrief\\_wasting/en/](https://www.who.int/nutrition/publications/globaltargets2025_policybrief_wasting/en/)

<sup>2</sup> WHO and UNICEF (2018). *The extension of the 2025 Maternal, Infant and Young Child nutrition targets to 2030*. Discussion paper.

<sup>3</sup> UNICEF, WHO and the World Bank Group (2016). *Levels and trends in child malnutrition*. Joint Child Malnutrition Estimates. Key findings of the 2016 edition.

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<sup>6</sup> FAO, WFP, WHO and UNICEF (2019). *Asia and the Pacific, Regional Overview of the State of Food Security and Nutrition*.



In Asia and the Pacific, there has been insufficient attention to addressing the drivers and determinants of wasting in a comprehensive and co-ordinated manner to prevent children from becoming wasted. In some countries, efforts to address wasting have primarily focused on treatment, often in the context of humanitarian crises, yet the coverage of treatment also remains unacceptably low across all countries where wasting is a public health concern.

To accelerate progress towards the SDG targets on wasting, there is a need to develop and scale up radically improved solutions to address the underlying drivers and determinants of wasting while ensuring that treatment is available to all children who need it. A sustainable impact on these drivers can only be achieved through a combination of sustainable and resilient food systems to ensure access to healthy diets, health services that provide quality universal health coverage with essential nutrition and health actions for children and women and social protection mechanisms to protect those who are most vulnerable. However, to date, the response by all stakeholders – including the UN system – has been too siloed and fragmented.

It is now more important than ever, in the context of the COVID-19 pandemic, to resolve the bottlenecks and barriers that are holding back progress. Unless effective action is taken, the number of wasted children in the region is likely to increase due to the secondary impacts of the pandemic on the access to nutritious foods and on the delivery, access and utilisation of health and nutrition services to prevent and treat wasting.

### The United Nations Global Action Plan on Wasting

In March 2020, five UN agencies (FAO, UNHCR, UNICEF, WFP and WHO) released the Framework for Action for the UN Global Action Plan

on Child Wasting (hereafter ‘GAP Framework’) to accelerate progress in preventing and managing child wasting.<sup>7</sup>

The GAP Framework identifies four outcomes to achieve the SDG targets on child wasting and to improve the early detection and treatment for those who need it: (1) reduced incidence of low birth weight, (2) improved child health, (3) improved infant and young child feeding and (4) improved treatment of children with wasting. For each of these outcomes, the GAP Framework defines proven pathways to accelerate the delivery of essential actions and to create a more enabling environment for their success.

The GAP Framework aims to support countries in prioritising and coordinating the delivery of preventive and treatment actions across four key systems: food, health, social protection and water, sanitation and hygiene. It is designed to be relevant for all populations affected by wasting, including development and humanitarian contexts as well as marginalised groups, and recognises the need to engage and empower communities. It will be accompanied by a global Roadmap for Action to form the complete UN Global Action Plan on Child Wasting.

### The Asia and Pacific Regional Action Plan

During the development of the GAP Framework, the regional offices of four UN agencies (FAO, WFP, WHO and UNICEF) considered how the UN can collectively support regional and country efforts to prevent and treat wasting in the Asia and Pacific region. These regional-level consultations took place within the Asia United Nations Network on Nutrition for the Scaling Up Nutrition Movement (AUNNS) and contributed to the design of the GAP Framework in order that it reflected policy and programming priorities in the region.

On the basis of these consultations, the AUNNS developed a preliminary Asia Regional Action Plan in November 2019. The GAP Framework was released in March 2020, just weeks into the COVID-19 pandemic. In September 2020, the AUNNS reconvened to review and update the preliminary regional plan to:

- 1) ensure alignment between the GAP Framework and the regional plan;
- 2) take into consideration the impact of the COVID-19 pandemic on wasting and on services to prevent and treat wasting;
- 3) identify regional level actions on regional advocacy and platforms, technical support, evidence generation and knowledge sharing, resource mobilization, and support for the operationalization of the GAP Framework at country level and on tracking progress; and
- 4) include intermediary milestones under each focus area, with agency leads.

With regional UN coordination mechanisms already in place in Asia and the Pacific, this regional plan, once finalised, will help to ensure that the AUNNS focuses its efforts on a core set of catalytic actions, with clear agency accountabilities, to support priority countries in accelerating national efforts to prevent and treat wasting.

### Operationalising the GAP Framework at country level

In the coming months, UN agencies at both regional and country level will support countries with high wasting burdens to develop Country Roadmaps for Action under the leadership of national governments. These roadmaps will identify a set of priority actions needed to accelerate progress on the prevention and treatment of wasting which can then be integrated into broader national policies, strategies and plans. Countries will be encouraged to follow a comprehensive approach to develop these roadmaps that engages actors across multiple systems (health, food, social protection and water, sanitation and hygiene) and multiple stakeholders (development and humanitarian partners, bilateral and multilateral organisations, civil society and the private sector).

Child wasting is part of a wider nutrition crisis in Asia and the Pacific that includes stunting, overweight and micronutrient deficiencies. These forms of malnutrition affect the same countries, communities and often the same child. They also share common risk factors including poor maternal nutrition, poor feeding practices and diets and socio-economic deprivation. We therefore recognise that it is crucial to integrate actions to prevent and treat wasting into existing or forthcoming national multi-sector nutrition strategies and plans and we reconfirm our commitment to support governments in addressing maternal and child malnutrition in all its forms.

<sup>7</sup> Global Action Plan on Child Wasting: a framework for action to accelerate progress in preventing and managing child wasting and the achievement of the Sustainable Development Goals. <https://www.who.int/publications/m/item/global-action-plan-on-child-wasting-a-framework-for-action>



Mother and child in Bhopal India



One to one counselling in Cox's Bazar camp, Bangladesh, 2020

## Previous FEX articles of relevance for wasting in South Asia

A number of past articles in Field Exchange cover experiences of wasting prevention and treatment in South Asia and are worth highlighting again due to their relevance to this special issue. Find below a list of these with links to the articles online.

### India

Arjan de Wagt, Eleanor Rogers, Praveen Kumar, Abner Daniel, Harriet Torlesse and Saul Guerrero (2019). Continuum of care for children with wasting in India: Opportunities for an integrated approach. *Field Exchange* issue 60, July 2019. p82.

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Vani Sethi, Praveen Kumar and Arjan De Wagt (2019). Development of a maternal service package for mothers of children with severe acute malnutrition admitted to nutrition rehabilitation centres in India. *Field Exchange* 59, January 2019. p24.

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Sreeparna Ghosh Mukherjee, Pia Sen and Dr Nagma Nigar Shah (2019). Ensuring pregnancy weight gain: An integrated community-based approach to tackle maternal nutrition in India. *Field Exchange* 61, November 2019. p14. [www.ennonline.net/fex/61/pregnancyweightgain](http://www.ennonline.net/fex/61/pregnancyweightgain)

### Pakistan

Bridget Fenn (2017). A cluster RCT to measure the effectiveness of cash-based interventions on nutrition status, Sindh Province, Pakistan. *Field Exchange* 54, February 2017. p61.

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Jahangir Hossain, Nazneen Rahman, Mohammad Hafijul Islam, Md Hasanuzzaman, Khrist Roy and Dlorah Jenkins (2019). A multi-sector approach to improve nutrition: Experiences of the Nutrition at the Center project, Bangladesh. *Field Exchange* 59, January 2019. p54.

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### Afghanistan

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Ahmad Nawid Qarizada, Maureen L. Gallagher, Abdul Qadir Baqakhil and Michele Goergen (2019). Integrating nutrition services into mobile health teams: Bringing comprehensive services to an underserved population in Afghanistan. *Field Exchange* 61, November 2019. p62.

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Deulekh Village, Bajhang District, Nepal, 2016; WFP/Bikkil Sthapit

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Emergency Nutrition Network (ENN) is a UK registered charity that strives to enhance the effectiveness of nutrition policy and programming by improving knowledge, stimulating learning and building evidence. We are passionate about being field-driven and are globally recognised as thought leaders and conveners in nutrition.

ENN is based in the UK but works globally and is made up of a team of technical experts in nutrition with decades of collective experience in the field. We work alongside governments, the United Nations, non-governmental organisations or charities, and research institutions worldwide to look critically at existing practices, raise awareness of issues and drive change so that those working to tackle malnutrition can do the best possible job. We do this by:

1. Capturing what works and what is needed to reduce malnutrition – working with people implementing programmes to help them examine their experiences and document their achievements and challenges.
2. Coordinating technical bodies to increase the global understanding of malnutrition – particularly focusing on the most nutritionally vulnerable including infants and children, adolescent girls and mothers who are pregnant or are feeding their infants.
3. Supporting global efforts to reduce malnutrition – bringing our knowledge and technical expertise to strengthen the activities of organisations working to reduce malnutrition at the global level.

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Marie McGrath, Field Exchange Co-Editor

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