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Best Practice in Preventing Child Wasting within the Wider Context of Undernutrition

A Briefing Note for policy makers and programme implementers

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Acronyms

BMS	breast milk substitute
CHW	community health worker
EED	environmental enteric dysfunction
ENN	Emergency Nutrition Network
GAP	Global Action Plan
IFA	iron folic acid
LNS	lipid based nutrient supplements
MAM	moderate acute malnutrition
MMS	micronutrient supplements
MUAC	mid-upper-arm circumference
RCT	randomised controlled trial
SAM	severe acute malnutrition
SBC	social and behaviour change
SDGs	Sustainable Development Goals
SQ-LNS	small-quantity lipid based nutrient supplements
SUN	Scaling Up Nutrition
UN	United Nations
WASH	Water, sanitation and hygiene
WaSt TIG	Wasting-Stunting Technical Interest Group
WHA	World Health Assembly
WHO	World Health Organization



Introduction

UNICEF estimated that in 2020 nearly 150 million children under five years of age were stunted and approximately 50 million were wasted (1), numbers that are expected to rise as a result of the COVID-19 pandemic (2). The distribution of malnourished children varies between and within countries but the prevalence is highest among children in

Asia. It now seems likely that the 2025 Global Nutrition Targets will not be met (3) so millions of children will continue to experience the unacceptable consequences of undernutrition: many will die while the physical and mental development of the survivors will be impaired (4). The 16 million children who are both stunted and wasted are at particular risk (5;6).

Box 1 Definitions

The terms wasted and stunted were introduced in the early 1970s by John Waterlow to classify children with a low body weight for their height (wasted), a low body weight for their age (underweight) or who were short in height for their age (stunted). Wasting has been described as an 'acute' condition given its relatively rapid onset time and recovery period and stunting as a 'chronic' one given the condition's slower onset and limited opportunities for recovery. However, these terms may be misleading as wasting, if untreated, can last several months and can occur many times through a child's young life (7;8). Similarly, the process of stunting (i.e., having suboptimal linear growth) can start quickly in response to an acute event, such as food shortage or disease, and may be followed by wasting (9). Severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) are often used interchangeably with wasted terminology to indicate the severity of undernutrition.¹

Children are classified as either wasted or stunted by comparing their anthropometry to a universal child growth standard (10). A wasted child is defined as one whose weight has fallen significantly below the weight of children of the same height and sex in the growth standard population and a stunted child is defined as one whose height has fallen significantly below the height of children of the same age and sex in the growth standard population. Children concurrently wasted and stunted fall into both definitions. Finally, the mid-upper-arm circumference (MUAC) measurement can also be used to assess the severity of undernutrition as a low MUAC identifies children at high risk of death.

Stunting is the process by which linear growth is slowed or halted in relation to age (linear growth faltering). Wasting is the process by which body weight is lost or gain in weight in relation to height is insufficient (ponderal growth faltering).² The use of the terms 'wasting' to mean 'wasted' and 'stunting' to mean 'stunted' however is quite widespread but it is important to recognise that, before children are classified as either wasted or stunted, they have been through either a rapid or gradual process of linear or ponderal growth faltering (or indeed both).

Underweight is a term used to describe children with a low weight in relation to their age when compared to the World Health Organization (WHO) child growth standard. It is a composite indicator of wasting and stunting and is mainly used for clinic and community-based growth monitoring programmes.

¹ Nutritional oedema (kwashiorkor) which is classified as a severe form of acute malnutrition is not included in this brief.

² Both these processes can start in utero or from birth

Considerable attention has been given to stunting prevention including, most recently, the 'exemplar series' (11) in which an analysis of countries that have made good progress in reducing the prevalence of stunted children was conducted to learn lessons about what works in stunting prevention. However, far less attention has been paid to improving our understanding of how to prevent wasting. This knowledge gap is a serious problem because treatment does not address the immediate and underlying causes of wasting and one episode of wasting (even if treated) can leave a child more vulnerable to another episode. In addition, wasting and stunting are inextricably linked both through common causes and shared causal pathways and because episodes of wasting are now known to slow linear growth and therefore increase the risk of stunting. Some evidence also suggests that being stunted leads to an increased risk of wasting although the magnitude of risk and the causal mechanism are less clear. Add to this the increased risk of dying linked to being wasted, to being stunted and particularly to being wasted and stunted at the same time, and the need for an equal focus on prevention of both outcomes becomes more urgent (12) (see Box 2).

This brief is based on work since 2014 by the Wasting Stunting Technical Interest Group (WaSt TIG)³ and the Emergency Nutrition Network (ENN). It updates previous reports on wasting prevention by ENN (13) and builds on

ENN's recent position paper on wasting (14). It attempts to begin to close the gap between what we know about how to prevent stunting and how to prevent wasting and is aimed at programmers, practitioners and policy makers involved in nutrition, many of whom will be national actors. As such, it highlights the practical implications for national policy and programmes as well as for global research investments.

Recognising the differences in epidemiology, it is becoming increasingly clear that achieving global targets for either stunting or wasting are unlikely to be successful until prevention programming approaches and packages address the causes of both forms of undernutrition together. To do this, we need to challenge long held views that wasting is largely reversible and acute while stunting is irreversible and chronic and that they happen at different points in a child's development and in different locations.⁴ With the recent launch of the United Nations (UN) Global Action Plan (GAP) on child wasting (15) and the inclusion of prevention of wasting within WHO guidance development plans, it seems the right time to consolidate learning on what we know (see Box 2) and the gaps in evidence.

³ Nutritional oedema (kwashiorkor) which is classified as a severe form of acute malnutrition is not included in this brief.

⁴ Wasting is a major focus in humanitarian contexts and much less so in development contexts. The opposite is true for stunting.

Box 2 The consequences of being wasted for stunting and other outcomes

- The risk of dying increases as a child becomes more wasted. Severe wasting carries the highest risk of death (~12 times more likely to die than a non-wasted or stunted child). Children who are wasted and stunted at the same time (concurrently) also have an increased risk of dying that is comparable to children with the most severe form of wasting (16).
- Being wasted, even after recovery following treatment, may increase the odds (by three times) of the same child becoming wasted again (17).
- The probability that a child will relapse after treatment is proportional to the degree to which they were wasted on admission (18;19).
- High rates of post-treatment relapse mean a higher burden of wasted children, higher cost-per-effective-treatment and high risks of non-responsiveness to treatment (20).
- There is no significant catch up in linear growth during severe wasting treatment and height-for-age often deteriorates even in the presence of some linear growth (21).
- Being wasted increases the odds of becoming stunted three months later (by three times) even after accounting for existing level of stunting (17).





What do we know about wasting prevention?

This section is organised around a series of statements related to what we know needs to be done to prevent wasting. These statements have been developed based on prior work by ENN and the WaSt TIG and a review of evidence since 2014 in key areas. The statements draw on recent systematic reviews completed in the areas of wasting and stunting and reflect a summary of learning that the authors consider to be the most critical for achieving progress.⁵

With each statement we first summarise the evidence on the causes and risks of wasting and the overlap with stunting. This is followed by a bulleted summary of key considerations and evidence-based actions/interventions that could help to prevent wasting and that tackle risk factors common to both wasting and stunting.

Preventative actions for stunting and wasting should overlap

There is increasing evidence of shared risk factors, including in the womb, for wasting and stunting (22;23). In fact, one literature review found no risk factor for wasting that was not associated with stunting (24). Risk factors include direct causes such as a mother's health and nutrition, disability, infectious disease and diarrhoea (including environmental enteric dysfunction (EED)⁶) and infant and young child feeding and care practices. These shared risks increase vulnerabilities during infancy and childhood (leading to more wasting and more stunting) (see Box 2).

These risk factors vary by location with underlying and indirect causes such as poverty, inadequate levels of maternal education, weak systems and infrastructure at country-level

and protracted crisis (both conflict and climate driven) as well as seasonality⁷ known to be important drivers.

To achieve more comprehensive programming that addresses the important causes of both stunting and wasting we need to consider:

- ***A preventive approach that interrupts the process of wasting at key stages of life where vulnerability to undernutrition is greatest (motherhood, early childhood and adolescence)***

This is in line with the recently released UNICEF nutrition strategy 2020-2030 that calls for the prioritisation of prevention in all contexts, an explicit focus on reducing child malnutrition in all its forms and a comprehensive life cycle approach to nutrition programming⁸ (25). Recent positive progress in the UN enabling environment places UNICEF, with its multi-sector remit, as the lead agency to support governments in a more comprehensive approach to the prevention of wasting.

- ***Better recognition of the problem of wasting outside of humanitarian contexts***

This issue was raised by Gross and Webb in their paper 'Wasting time for Wasted Children' over 15 years ago (26) but was not developed further in strategy or action due to a lack of evidence, resources and policy guidance. We

⁵ This brief did not involve a full 'systematic review' of all evidence but did explore a number of key documents, research papers and existing systematic reviews.

⁶ Environmental enteric dysfunction (EED) is damage to the gut following repeated infection and diarrhoeal illness. This damage means that the gut cannot absorb nutrients well and thus contributes to poor nutrition. This happens even without ongoing diarrhoea so may be 'invisible'.

⁷ Seasonality influences access to food and feeding practice, infectious disease and birth weight (see next sections).

⁸ The life cycle approach was the dominant UNICEF and WHO model back in the 1990s. It has been reformulated with a stronger evidence base for recent strategies.

also need to better understand and prioritise wasting prevention efforts in development contexts and stunting prevention efforts in humanitarian situations, particularly those that are protracted.

- **Action plans that address the value of combined and comprehensive preventive programming for stunting and wasting**

Action plans such as those linked to the new strategy for the Scaling Up Nutrition Movement (SUN 3.0) and the recently launched GAP for wasting (15) are an opportunity to outline the value of joined-up preventive programming for stunting and wasting and suggest mechanisms by which this can be achieved at country level.

- **Improved contextual and causal analysis of wasting and stunting**

Malnutrition causal pathways are complex. Contextual and causal analysis may help our understanding of how to prioritise the most cost-effective actions for the integrated prevention of stunting and wasting in the populations affected and where to focus scarce resources in any setting. While causal analysis tools exist, there has not been wide uptake due to the complexities of their implementation, limits in their ability to determine causality and a lack of prioritisation of interventions revealed in the findings (27). There is a real need for improved tools for causal pathway analysis and for gap analyses of known preventative measures that are feasible to implement in all settings and that better profile context specific risks for undernutrition as well as actions to address them. Tools that better support the identification of the common causes of both stunting and wasting would be one way of prioritising interventions for delivery and improving the cost-effectiveness of programmes.

- **Packages of multi-sector interventions that address the important causes of wasting and stunting**

A package of multi-sector interventions (such as health, agriculture, water, sanitation and hygiene (WASH), social protection, counselling and social and behaviour change (SBC)) that ensure access to a nutritious diet and prevent disease and that address some of the broader social and economic 'underlying determinants' of malnutrition are likely to be more effective at preventing wasting and stunting than single interventions, particularly when they target the same population. Whilst there is increasing evidence of better nutrition outcomes from programmes that deliver cross-sector interventions or combine multiple delivery platforms, much of this evidence relates to impacts on stunting. Case studies on stunting have showed that indirect actions targeting the underlying and social determinants of malnutrition (such as poverty, fertility, agriculture, WASH and parental education) accounted for about half of the identified reductions in stunting (28). Whilst there is some evidence of the impact of packages of support on wasting (discussed in relevant sections below), more studies that

are able to show the impact of delivering interventions together are needed.

Good health and a healthy environment for women and young children are critical

The close relationship between nutrition and health, as described by the malnutrition-infection cycle,⁹ means that there is a strong case for both health and WASH programming to support the prevention of wasting and stunting simultaneously through the reduction of infectious disease, diarrhoea, helminthic infections and EED (28;29). Whilst the relationship between diarrhoea, infectious diseases such as measles and wasting is fairly well established (30;31), EED is more recently identified as being associated with poor outcomes including stunting, wasting and lower vaccine efficacy among children living in poor settings (32;33). Given this, the separate delivery of health and nutrition services is very likely to constrain impacts on nutrition outcomes.

To prevent wasting, we need to consider health and a healthy environment for women and young children as part of a package of interventions:

- **A more evidence-based approach to WASH programming**

Evidence shows that household interventions such as hand washing and point-of-use water chlorination are unlikely to improve child growth unless they achieve very high coverage and adherence. Instead, community-level sanitation interventions that radically reduce faecal contamination in communities and households may have greater impact on nutrition outcomes (34). Examples of these interventions include continuous and convenient access to uncontaminated water and high community coverage of improved sanitation facilities.

- **Prevention of infection is critical**

Generally, the prevention of childhood infection, through vaccination, routine vitamin A supplementation to reduce the occurrence of both diarrhoea and measles and therapeutic and preventive zinc supplementation for diarrhoea management, is widely supported by agencies such as WHO for the prevention of wasting as well as reducing the risk of mortality more broadly, particularly diarrhoea and measles-specific mortality. However, evidence for the impacts of these interventions on improved growth outcomes such as wasting and stunting is still lacking (31;35).

⁹ Malnutrition can make a person more susceptible to infection and infection also contributes to malnutrition which causes a vicious cycle. An inadequate dietary intake leads to weight loss, lowered immunity, cell damage and increased frequency and severity of infection. In turn, infection leads to reduced appetite, impaired absorption of nutrients, weight loss and slowed growth and development in children.

- **Prevention of malaria may be important in some locations**

The prevention of malaria, either through prophylactic treatment or the distribution and use of bed-nets, has been found to have a positive effect on birth weight, anaemia in pregnant women and child mortality (31). Impacts on wasting specifically are still being explored but may be important. Of the studies examining the impact of lipid based nutrient supplements (LNS)¹⁰ given with complementary feeding to young children (36), the largest impact on preventing moderate wasting was one study in which LNS was provided as part of a package that included testing for and treating malaria and diarrhoea.

Mothers and the initial months after birth matter

A high prevalence of wasting (being wasted) and stunting (being stunted) is present in infants at birth – recent estimates suggest that 30% of wasting and 20% of stunting occurs during pregnancy (37;38). Mothers’ characteristics and experiences are therefore critical predictors of wasting and stunting in infants. For example, higher maternal weight and higher education achievement predict better nutrition at two years of age both in terms of weight and height (22;23). In addition, there can be large variation in nutritional status at birth depending on the month or season of birth. One study in

the Gambia found that infants who were wasted during the first rainy season (typically the lean/‘hungry’ season) of their lives had an increased risk of wasting during the same season the following year, even if they recovered in the intervening dry season (17).

Wasting in early life leads to an increased risk of wasting in later life. Recent data from South Asia and sub-Saharan Africa has shown that wasting occurs most frequently in the first three months of life and that being wasted during the first six months of life leads to an increased risk of subsequent wasting and stunting during later childhood (39;40). As a result, actions to prevent wasting and stunting during pregnancy and early infancy are likely to have impacts that extend throughout childhood.

To improve the nutrition of mothers and infants we need to consider:

- **Greater attention to the nutrition needs of women before pregnancy**

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

¹⁰ Ready-to-use lipid-based nutrient supplements (LNS) are a highly nutrient-dense supplements that are used to supplement the nutrient intake of nutritionally vulnerable groups such as pregnant women and young children. They are usually given as a small-quantity (SQ-LNS) supplement.



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interventions have been shown to improve fetal growth and reduce nutrition deficits in early infancy in South Asia (41) but remains a neglected area of programming. These investments should be underpinned by efforts to improve adolescents' nutrition, prevent adolescent pregnancies and reduce gender inequities and other social and health determinants of infant nutrition at birth.

- **Strong evidence for multiple micronutrient supplementation for pregnant women**

For pregnant women, multiple micronutrient supplements (MMS) that replace iron folic acid (IFA) provide the strongest evidence to date for improving birth outcomes including infant nutritional status measured by height and weight (42). WHO's most recent statement on this intervention has changed from 'not recommended' to 'recommended in the context of rigorous research' whereby they highlight the potential benefits of replacing iron folic acid with MMS, although note that outstanding questions remain and further research is needed (43).

- **Balanced protein, energy and micronutrient supplements given to undernourished women during pregnancy**

There is growing evidence that nutrition supplementation that includes balanced protein, energy and micronutrients (such as LNS) given to undernourished women during pregnancy could reduce newborn stunting and wasting and small head size compared with IFA and MMS supplementation alone (44-46). Whilst maternal protein energy supplementation was identified as an 'evidence-based intervention' for some (food insecure) contexts in the Lancet's 2013 and 2021 nutrition series, it remains an underutilised intervention due to questions linked to cost-effectiveness and feasibility as well as concerns around bigger head size in the absence of good obstetric care, particularly for very young mothers (31). There is scant research and programmes that have documented impacts on diet and nutrition outcomes of 'food-based approaches' in pregnancy in food secure contexts for which further evidence is needed.

- **Early prevention and identification of growth failure among infants less than six months of age**

There is a need to identify growth failure¹¹ early and prevent it with a range of actions, such as social/ psychosocial support for mothers as well as breastfeeding and non-breastfeeding support that reduce the multiple risks associated with replacement feeding (48). While indicators such as low weight-for-age (see Box 1), weight faltering,¹² low birth weight (<2500g) and low weight-for-length are commonly used to identify growth failure in infants, there is building evidence that the use of weight-for-age or MUAC measurement could be more effective than weight and height-based measures at identifying an increased risk of dying in this group (49) (see Box 1).

- **Breastfeeding interventions**

Breastfeeding interventions (community and facility-based), such as support for the early initiation of breastfeeding

within one hour of birth, exclusive breastfeeding and lactation support (ideally with the inclusion of fathers/ family members) can improve feeding practices and may improve infant growth (50). There is also some evidence, going back two decades, that a mother's diet and nutritional status may affect breast milk nutrient concentrations (51;52) which, given the importance of exclusive breastfeeding, underlines the significance of improving women's nutritional status (see above). For non-breastfed infants, the priority is always to restart breastfeeding where possible through relactation using techniques such as supplementary suckling,¹³ wet nursing and donor human milk. This should be informed by culture, current acceptability to mothers and service availability. If these options are not acceptable to mothers/ caregivers or are not feasible to deliver, support for an assured supply of an appropriate breast milk substitute (BMS), accompanied by an essential package of support, is recommended (53). The range of interventions to support nutritionally at-risk mothers and infants under six months is reflected in tools developed by the MAMI Global Network.¹⁴

- **Seasonality**

Finally, given the evidence around the impact of season on birthweight and the future risk for growth failure, season should be one factor considered for interventions that target women (see Box 3).

Improving the diets of children over the age of six months is essential

In the period when children are between six and 23 months of age, they are no longer sufficiently nourished by breast milk alone and require nutrient-dense complementary foods.¹⁵ In settings where food insecurity is common, complementary foods are typically inadequate in quantity and quality so children in this age group often experience growth faltering (54). The most recent data on the quality of complementary foods and feeding practices indicate that globally two in three children aged 6–23 months (72%) are not fed even the minimum diverse diet needed

¹¹ A growth rate below the appropriate growth velocity in weight or height for age (47)

¹² Not increasing in weight or dropping across centiles on a growth chart (ibid)

¹³ A technique to establish or re-establish effective exclusive breastfeeding. It involves taping a narrow nasogastric tube (NGT) to the breast so that one end is next to the nipple and the other end is in a cup of appropriate BMS. This encourages the infant to suckle at the breast so as to stimulate breast milk production.

¹⁴ See Management of At Risk Mothers and Infants (MAMI) Special Interest Group| ENN (ennonline.net)

¹⁵ Complementary foods are foods or drinks (e.g., infant cereals, fruits, vegetables, water) given to young children in addition to breastmilk or infant formula. WHO recommends their introduction from six months of age.

for healthy growth (25). In addition, wasting among these children commonly increases at specific times of the year, often coinciding with pre-harvest depletion of food stocks, rises in food prices and/or increased disease transmission as a result of the rainy season (55).

To improve the diets of young children, particularly of those in the 6–23 month age group:

• *Improving the availability of high quality complementary foods*

Interventions that improve the availability of high-quality complementary foods available to young children are central to the prevention of stunting and wasting (31;56). This can be done using different strategies:

- *Food and cash-based approaches*, i.e., those that aim to improve access to nutritious foods by the household through support for production or purchase, are important, yet the evidence for their impact on growth outcomes remains scarce (28). There is growing evidence that demonstrates positive associations between support for increased agriculture and livestock production as well as cash/voucher transfers and dietary diversity (of households, children and/or women) and dietary quality including increased intake of essential micronutrients where this is measured (57;58). Evidence is more limited for the impacts of these interventions on growth, i.e., stunting and wasting.
 - Increasing consensus suggests the need for nutrition-sensitive agriculture and livestock programming to focus on supporting access to and consumption of high-quality diets as a more logical and attainable goal rather than on directly reducing the prevalence of childhood stunting and wasting (59).
 - The combination of complementary interventions such as nutrition counselling and SBC with social protection, cash and voucher programmes is important to ensure that the resources provided to the household are used to improve the diets of young children. Common approaches include combining cash transfers with nutrition counselling, the provision of fortified foods, curative and preventive health services (such as immunisations) and growth promotion (60).
- Where nutrient-poor diets are common and access to diverse foods is limited, interventions that provide *fortified supplementary foods* to all children under two years of age, regardless of their nutritional status, are common (61). Research has recently demonstrated the potential effect of food supplementation in preventing wasting in this age group including an estimated 18% reduction in the percentage of moderately wasted children given LNS with complementary feeding (36) and the potential for an even bigger impact on the

reduction of the incidence of wasting¹⁶ (62). The most recent Lancet nutrition series states that evidence in support of the use of SQ-LNS among at-risk children is strong and, in contrast to micronutrient powders alone, the benefits on growth and anaemia are advantageous (31).

- There are cost implications that may be prohibitive when these products are provided free by programmes. However, there remains a need for better cost-effectiveness data in different settings to enable comparison with food based approaches that increase diet diversity and the consumption of animal source foods. There is some evidence to suggest that families may be willing to purchase these products and that a hybrid delivery strategy that includes a market-based mechanism might be feasible in some settings (63).
- How and when supplementation with foods like LNS is delivered impacts the effectiveness and cost-effectiveness including coverage of the intended target population. Intervention design needs to account for:
 - The seasonality of wasting in target communities (39;55)
 - How supplementary foods are used within the home and whether the target child will receive the full intended 'dose' (61)
 - Which food best fits the culture and is easier to manage from a service provision perspective
 - The opportunity costs of interventions for participants. This includes the need to consider accessibility and leveraging community-based platforms such as networks of community health workers (CHWs), pre-, peri- and post-natal consultations, growth monitoring services and vaccination campaigns for reaching children at risk. This has been shown to improve the coverage and effectiveness of wasting prevention actions for children over six months of age (62;64). Other important dimensions of opportunity costs include whether or not a food has to be cooked or is in ready-to-use form (65;66).
- *Nutrition counselling and SBC* involve the strategic use of communication approaches across a variety of channels to promote changes in the knowledge, attitudes, norms, beliefs and behaviours of the mother or caregiver. Provided alone in food secure locations or in combination with food provision in food insecure locations, SBC methods can improve complementary feeding practices, caregiver knowledge on feeding practices, dietary diversity and child growth outcomes (31).

¹⁶ The number of new cases of wasting that develop in a population over a set period of time (usually one year)



Conclusions

The prevention of wasting should be an urgent priority with prevailing actions proving inadequate to bring down the prevalence of wasting effectively. Recent work finds that, despite global targets to reduce wasting, wasting prevention is not being prioritised relative to stunting prevention or wasting treatment (67). This brief presents a summary of the key evidence on what we know about wasting in terms of its drivers, actions to prevent it, programming approaches and learning needs. It also pulls out the knowledge gaps that need to be filled.

What does the evidence tell us about what we need to do to prevent wasting?

The evidence highlights that the current separation in policy, guidance and resourcing for wasting and stunting limits both the sustained recovery of the wasted child (by creating a disconnect between their treatment and ongoing rehabilitation) and the prevention of further episodes of wasting, with implications for linear growth. As such, there is a real need to shift policy directives and funding support towards simultaneously tackling both stunting and wasting. Embracing joint 'double duty' actions to prevent stunting and wasting through more integrated policy and programming has the potential to leverage shared opportunities and improve the cost-effectiveness of established programmes and policies that aim to reduce undernutrition.

There are many important implications for programming highlighted by the update presented here including the need to:

- **Consider prevention of wasting and stunting together**
Causes of wasting and stunting often overlap with direct

and underlying causes such as poor quality diets, infection, poverty, weak systems and infrastructure at country-level and protracted crisis (both conflict and climate driven) as well as seasonality, known to be important for both.

- **Understand and tailor to context**
An understanding of the distribution of wasting and stunting between and within countries and across development and humanitarian contexts, as well as of the most important causes of wasting and stunting in different locations, is critical for the prioritisation and design of effective actions.
- **Consider packages of interventions that address all locally relevant causes**
This requires a shift in focus from the treatment of wasting to both treatment and prevention, with the latter needing actions to prevent low weight at birth, protect against communicable diseases, improve water and sanitation systems, enhance health and nutrition knowledge and practices in young mothers (and fathers), promote exclusive breastfeeding for the first six months of a child's life, provide micronutrient supplementation and similar measures. A combination of these actions is needed to prevent wasting both in emergencies and for the much larger numbers of children who are wasted outside of emergencies. There is also a need for better evaluation of intervention packages that enables an improved understanding of what has (and has not) worked (see below).
- **Consider the peak incidence of wasting, both in terms of child's age and season**
Initial months matter and there is an urgent need to extend preventive actions to mothers during pregnancy and lactation and to the 0-6 month age group. Maximising coverage of interventions to coincide with

the peak incidence of wasting, particularly linked to season and age, is crucial to achieve impact.

In summary, for promoting wasting prevention, a life-course framing that emphasises child survival, growth and development is likely more effective than an outcome-focused framing on stunting and/or wasting. For this, there is much to be learned from the evidence of nations that have reduced wasting and kept it low. It is this learning, along with a more effective approach to generating evidence about what works and why, that will help us to achieve global targets as laid out by the sustainable development goals (SDGs) and the World Health Assembly (WHA) targets for both wasting and stunting.

Implications for research and how we understand the impact of interventions

ENN's Maximising the Quality of Scaling Up Nutrition Plus (MQSUN+) review on the prevention of wasting in 2018 concluded that evidence for the prevention of wasting was weak in many of the investigated intervention areas. While the evidence reviewed for this brief shows some progress in our understanding of the aetiology of wasting and in sector intervention areas such as WASH, multiple micronutrients and food supplementation for children, there remains considerable gaps including around the impacts on wasting and stunting of packages of multi-sector interventions, of the prevention of infection and of food and cash-based approaches. In addition, while there are now many promising interventions discussed above in

terms of measured effects on mortality and growth, the evidence for taking these to scale and an understanding of the reasons why interventions work in some contexts and not in others is still limited in many cases.

The scoping and systematic reviews planned through 2021 by WHO and partners to support the development of guidance for the prevention of wasting will report on interventions by sector, including knowledge gaps, in detail. The review completed for this brief highlights that there are several key elements needed to fill evidence gaps and to improve our understanding of what we need to do to prevent wasting. These include:

- ***Learn from nations that have reduced wasting and kept it low***

A series similar to the exemplar series recently published for stunting is now urgently needed for wasting that examines the contribution of resource allocations to wasting reduction, programmatic approaches, coverage of programmes and the role of different sectors including how they interact and influence the nutrition of women and children within food, health and education systems (68). An exemplar series for wasting should also examine the actions that have the potential to simultaneously prevent stunting and wasting so that we learn more about the convergence of preventive efforts and what is specific only to wasting prevention.

- ***Improve causal analysis***

A better understanding of the direct, underlying/indirect and enabling determinants of undernutrition in specific settings and for different vulnerable groups is needed to better profile and prioritise risks for undernutrition.

Box 3 From identifying wasting to identifying risk

Using anthropometric measures (weight, height and MUAC) can only provide a crude proxy for the physiological changes caused by undernutrition that lead to illness and death. Increasingly, the evidence is bringing us back to the utility of tracking and understanding the growth trajectory of a child over time to identify early growth problems as an indicator of risk. Child growth-monitoring services (based on regular measurements of weight that are plotted on a 'growth curve'), which prevail in many contexts, may provide a useful platform to achieve this at scale. The limited effectiveness of growth-monitoring programmes in many contexts has been widely documented; opportunities to strengthen these existing systems and link them to wasting prevention and treatment programmes should be explored. Critical to this approach will be the identification and communication of clear actions and pathways of care for infants and young children who are identified with growth failure.

Indicators that capture important risk factors beyond anthropometry should also be considered including birth weight, feeding practices, clinical status, previous episodes of wasting, disability, the mental health of caregivers, poverty and the accessibility of adequate health services. Many of these factors will change with community and environmental factors such as season, livelihoods and employment and access to social protection. Indicators should be context-specific, measurable in real-life conditions and lead to action.

Adapted from (14)

- **Rethink approaches to evaluate interventions and methods for assessing impact on outcomes along the pathway to better nutrition**

Particularly where there are evidence gaps and for programmes that are not well suited to measurement through a randomised control trial (RCT) design such as those related to packages of support, changes in livelihoods, food security or gender and workload of women. There is an increasing sense that 'pure' research will not provide all the answers and that what we need is well thought-through programmes based on a good understanding/hypothesis of the key determinants that contribute to wasting and an improved understanding of how the enabling environment for nutrition (including local capacities and governance) contributes to the impact on nutrition outcomes. This needs to be accompanied by rigorous and transparent monitoring and evaluation of trends over time and effective dissemination of learning to enable adoption at scale.

- **Measure and understand the incidence of wasting**

Prevalence measures mask the true burden of wasting (69). Recent data from the PROMIS project (62) reported

a baseline prevalence of severe wasting of 2.1-2.7% in infants 0-18 months of age and an annual incidence of approximately 17.5%, illustrating the degree to which prevalence can underestimate the true burden. To better measure incidence, we need to find innovative solutions that would allow regular monitoring of the primary outcomes of stunting and wasting among children under five years of age in order to reduce the reliance on small-scale impact-evaluation surveys or infrequent Demographic and Health Surveys. The resulting timely and more granular data could help to strengthen the course correction of programmes and thereby accelerate the rate of both wasting and stunting reductions among children. It could also help to better assess the impact and cost-effectiveness of interventions.

- **Improve definitions of nutritional risk and recovery**

A broader definition of risk beyond anthropometry that helps to identify children in need of support before they become wasted and stunted (see Box 3) as well as a set of evidence-based age appropriate interventions that can be applied at different points in the life cycle is needed.



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