**Understanding and Tackling the Links Between Acute and Chronic Malnutrition: 08/08/2017**

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| ***SUMMARY:***  The nutrition sector has tended to focus on wasting more in emergency situations and stunting, from more of a developmental perspective and this has tended to manifest itself in ‘siloed’ policies, plans, programmes and research. Key questions identified and addressed by an ongoing ENN initiative include:   * Why are we not intervening given the very high mortality risk associated with being concurrently wasted and stunted? * Are we doing enough to prevent poor infant and child growth where seasonality places added risks * Are we getting better at tackling wasting and stunting in the same programmes?   ***KEY FINDINGS AND MESSAGES:***   * Although reporting is weak, wasting and stunting occur together in many country contexts and often coexists in the same child * A period of being wasted (even just once) is a risk factor for being stunted. * Being concurrently wasted and stunted may have particular causal pathways and effects which are not yet fully understood. * The evidence confirms that wasting and stunting have shared risk factors (as illustrated by the UNICEF conceptual framework) * Both wasting and stunting are associated with increased mortality. Where they coexist in the individual child there is evidence to suggest that the risk multiplies to a similar risk as the severely wasted child. * Boys are more likely to be concurrently wasted and stunted than girls. This also appears to be the case for wasting and stunting dealt with separately. * Evidence suggests that linear growth slows at some point during wasting and therefore that early identification and treatment of wasting may play a role in preventing stunting in particular contexts. However, at the same time preventing both wasting and stunting relies on a range of nutrition specific interventions and nutrition sensitive approaches. * While there are efficacious treatments for wasting, there is little evidence of effective curative interventions for stunting. * The prevailing separation in policy, guidance and resourcing for wasting and stunting limits the impact of current efforts to reduce childhood undernutrition. * Given that wasting and stunting share many common risk factors, clearer policy directives are needed to encourage and facilitate practical links, for more integrated programming and services tackling the different risk factors common to stunting and wasting, rather than dealing with each relationship in a linear fashion * In view of the seasonal patterns of both wasting and stunting there is a need ensure that donor policies facilitate early preventative interventions aimed at mitigating seasonal peaks |

1. **Introduction:**

Globally, wasting (acute malnutrition) affects 7.7% or 52 million children under five (with 17 million being severely wasted) and stunting (chronic malnutrition) affects 22.9% or 155 million children under five years old each year.[[1]](#footnote-1) Wasting and stunting frequently co-exist in the same population (sometimes in the same child), but they are usually separated in terms of policy, guidance, programming and financing. Both forms of undernutrition share causal factors such as infectious diseases, poor diet and suboptimal infant feeding and caring practices, yet the physiological relationship between them and how interventions for one affect the other are poorly understood. Consequently, there is a need to better understand how children experience both wasting and stunting over time, and how to strengthen policies and programming (especially regarding prevention) to achieve impacts for both.

Providing a narrative review of the available literature on the relationship between wasting and stunting, the 2014 ENN Technical Briefing Paper[[2]](#footnote-2) evolved from critical analysis of the policy and programming divide associated with the wasting and stunting distinction and a growing concern regarding the negative implications for nutrition[[3]](#footnote-3). The basic message is that a shared understanding of the links between wasting and stunting opens up opportunities (and may indeed be a precondition) for more effectively tackling and eradicating undernutrition.

1. **Main Findings of the Technical Briefing Paper**

The Main Findings of the Technical Briefing Paper are summarized on the basis of five headings as follows:

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| **Main Findings on the Links Between Acute and Chronic Malnutrition** | |
| **BURDEN** | * Wasting and stunting occur together in many country contexts and may coexist in the same child, though this tends to be unreported. * Being concurrently wasted and stunted may have particular causal pathways and effects which are not yet fully understood. * Seasonality has a marked impact on both wasting and stunting prevalence. Rates of gain in weight and height often take place at different times of year and seem to be related over time in a consistent way, with height faltering peaking 2-3 months after weight loss/ wasting levels have peaked. |
| **SHARED RISK FACTORS** | * Wasting and stunting share mainly common risk factors (dietary inadequacy, infectious diseases in childhood, diarrhoea, maternal nutrition etc. as illustrated by the UNICEF conceptual framework) and evidenced by the literature which fails to identify risk factors for wasting which do not also apply to stunting. * There is evidence to suggest that inflammation and gut health may also play an important role in both wasting and stunting (either via the effects of chronic inflammation, malabsorption and/or appetite effects). * Only Environmental Enteric Dysfunction and zinc inadequacy were identified in the literature as risk factors only for stunting. * There is good evidence that in-utero conditions and foetal growth contribute significantly to stunting at birth and during infancy; and there is emerging evidence of contributions to wasting. |
| **SHARED EFFECTS** | * Both wasting and stunting are associated with increased mortality. Where they coexist in the individual child there is evidence to suggest that the risk multiplies to a similar risk as the severely wasted child. * Low muscle mass in both wasting and stunting and the link between muscle mass and survival during infection, suggest the risk of death associated with both conditions may be mediated through decreased muscle mass (requires further investigation). * Stunting is associated with child mental (cognitive) and psychomotor development. Evidence for wasting being associated with mental (cognitive) and psychomotor development is less strong. |
| **DIRECT RELATIONSHIPS** | * Evidence suggests that linear growth slows at some point during wasting and that episodes of wasting in the previous three months (approximately) have an impact on attained length-for-age. Therefore, early identification and treatment of wasting may play a role in preventing stunting in particular contexts. * Evidence that wasting treatment promotes linear growth of individual children is mixed. There are indications that optimising ready to use therapeutic food (RUTF) to include specific nutrients required for linear growth and development could have positive effects. However, preventing stunting relies on a range of nutrition specific interventions and nutrition sensitive approaches. |
| **POLICY AND PROGRAMMATIC APPROACHES** | * There is some encouraging operational research suggesting that both wasting and stunting (to a lesser extent) may be reduced with similar preventative food based approaches. * However, while there are efficacious treatments for wasting, there is little evidence of effective curative interventions for stunting. * The prevailing separation in policy, guidance and resourcing for wasting and stunting limits the impact of current efforts to reduce childhood undernutrition. * Given that wasting and stunting share many common risk factors, clearer policy directives are needed to encourage and facilitate practical links, for more integrated programming and services tackling the different risk factors common to stunting and wasting, rather than dealing with each relationship in a linear fashion * In view of the seasonal patterns of both wasting and stunting there is a need ensure that donor policies facilitate early preventative interventions aimed at mitigating seasonal peaks |

Furthermore, an overview of follow up research priorities identified by WAST-TIG is attached as Annex One. The latest update and presentation of 2017 preliminary findings emerging from WAST-TIG included the following headlines:

* A period of being wasted (even just once) is a risk factor for being stunted.
* Being wasted and stunted at the same time (concurrently) conveys an elevated risk of mortality comparable with that associated with being severely wasted
* Boys are more likely to be concurrently wasted and stunted than girls. It looks like this is also the case for wasting and stunting dealt with separately.
* Younger children (<2yrs) are more likely to be concurrently wasted and stunted than older children.
* The season a child is born in defines its experience of wasting and stunting throughout childhood.

1. **Recommended Actions:**

The Technical Briefing Paper specifically suggests five key areas requiring follow up:

1. **Longitudinal data tracking nutritional status**: Measuring the association between wasting and stunting is challenged by the common use of cross sectional prevalence data. This does not allow for the capture of incident wasting cases occurring over time, nor how the causal pathways for wasting and stunting develop over time separately and in combination. Collection and analysis of longitudinal data tracking children’s status over time is required to better inform the design of services aiming to intervene in these causal pathways.
2. **Concurrent wasting and stunting:** The extent of the burden of concurrent wasting and stunting remains largely unknown, as do the full implications for a child experiencing both deficits. However, data is available that could be analysed as a priority to quantify national, regional and global burdens of concurrent wasting and stunting. Further research/analysis of mortality and morbidity implications of concurrent wasting and stunting is also required. At the same time the coverage of these children by existing nutrition interventions requires investigation.
3. **Common prevention approaches and research**: As wasting and stunting share mainly common risk factors, then there is no requirement to continue with different preventive intervention packages. Common prevention approaches are required and policies which separate the two re-examined. In addition, research could more routinely measure impacts on incidence of both forms of undernutrition in order to more appropriately inform programming for both conditions. As wasting can adversely affect linear growth the timely identification and treatment of wasting is an important component of stunting prevention in some contexts. The question of whether protocols for the treatment of wasting could also be optimized, (i.e. through reformulation of RUTF) to promote linear growth requires further investigation.
4. **Maternal nutrition:** Evidence included in the review that both wasting and stunting have origins in foetal growth highlights the importance of attention to maternal and adolescent girl health and nutrition as part of wasting and stunting prevention approaches.
5. **Seasonal approaches:** The evidence of seasonal and related patterns in wasting and stunting does not infer causality as other seasonal factors may be involved. Further research is needed to better understand these seasonal relationships and to build on existing experience of what works to mitigate seasonal peaks in both deficits.
6. **Burden and Prevalence of Wasted and Stunted Children in the Context of Current of Major Humanitarian Crises:**

As recognized by the EU Consensus ‘extreme and chronic fragility, structural and recurring crises remain the source of humanitarian emergencies’ and the 4 crises are the long lasting consequences of pre-existent crises. Since the four famines represent about 22.5% of the total amount of people in food crisis this year, a global approach should be privileged looking at the global picture of food crises, not only the four famines.

Understanding the interrelationship between wasting and stunting highlights that in addition to being an important component alongside the treatment of wasting, a nutrition sensitive approach to both developmental and humanitarian assistance in the context of humanitarian crises is essential to prevent undernutrition as well as to strengthen resilience and avoid the escalation of the crisis into a famine situation. It also highlights the requirement to ensure a strategic and systemic approach to the treatment of acute malnutrition as a crucial component of the health system in the medium and long term

As mechanisms for situation assessment and analysis become increasingly sophisticated and comprehensive in nature, and the importance of timely intervention is reinforced as the most effective way to avoid humanitarian crises, at the same time it is imperative to ensure both the political commitment and functional / technical capacities to ensure appropriate resource allocation and effective implementation based on the specific priorities identified.

***Overview of Nutrition Data in the Context of Ongoing Major Humanitarian Crises:***

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|  | **2017 UN Appeal (Euro million)** | **Est Number Affected by Food Crisis (IPC / GRFC)[[4]](#footnote-4)** | **Est Number GAM cases and % Prevalence** | **Est Number Stunted Children and %** | **2017 EU Allocation (total in millions)** | **ECHO Allocation (in millions)** | **DEVCO Allocation (in millions)** |
| ***North Nigeria*** | 1,024 | 8.1 million | 9.5% GAM in Northern East Region implying approx.  2 million GAM cases (of which 750,000 SAM cases)[[5]](#footnote-5) | 11 million - 33% Stunting (National)  16.7% North East Region[[6]](#footnote-6)  approx. 6 million | 207.5 | 59.5 | 148 |
| ***South Sudan*** | 1,490 | 4.9 million | 17.9% GAM with 1.1 million GAM cases | 31%  498,000[[7]](#footnote-7) | 146 | 112 | 34 |
| ***Somalia*** | 803 | 2.9 million | 15.6% GAM  with 363,000 GAM cases[[8]](#footnote-8) | 26% 461,000[[9]](#footnote-9) | 198.7 | 78.7 | 120 |
| ***Yemen*** | 1.955 | 17 million | 2,030,000 GAM cases of which 462,000 SAM cases[[10]](#footnote-10) | 47%  1.8 million[[11]](#footnote-11) | 116[[12]](#footnote-12) | 46 | 70 |
| **TOTAL** | **5,272** | **32.9 million** | **Almost 5.5 million GAM cases (number of SAM cases in excess of 1 million)** | **8-10 million [[13]](#footnote-13)** | **668.2** | **296.2** | **372** |

**ANNEX 1: Overview of Research Priorities Identified by WAST-TIG (2016)[[14]](#footnote-14):**

Question 1: “Can interventions outside of the 1,000 days, e.g. pre-school, school-age and adolescence, lead to catch-up in height and in other developmental markers?”

This area has had little attention but could have important implications; for example with adolescent girls where the evidence shows that maternal stature may predict a child’s size at birth. The timing of interventions to promote catch-up growth in mid-childhood and adolescence is not well understood, but may be important for meeting undernutrition targets.

Question 2: “What timely interventions work to mitigate seasonal peaks in undernutrition (both wasting and stunting)?”

A number of countries have strong seasonal patterns of stunting and wasting that may illustrate some correlation between the two forms of undernutrition, but there are many unanswered questions in this area. Recent trials have shown the provision of seasonal nutritional supplementation in Niger to have effects on both wasting and stunting (Isanaka et al, 2008). The prioritisation of this question is a call for future studies to measure both wasting and stunting.

Question 3: “What is the optimal formulation of RUTF to promote optimal ponderal growth and also support linear growth during and after SAM recovery?”

This question reflects the fact that few studies of SAM or moderate acute malnutrition (MAM) treatment have looked at linear growth during or after treatment, or compared different formulations of RUTF in trials of adequate size. Where such studies exist, findings suggest no positive effect of RUTF on stunting. However, there is evidence that linear growth ceases or slows down during periods of wasting, therefore timing of restarting linear growth and how to support this during treatment for wasting is considered a research priority.

Questions 4 and 5: “What is the role of pre-pregnancy nutritional status in determining risk of being born stunted and/or wasted?” and “What are the effective packages of interventions for both maternal nutrition and new-born outcomes?”

There is an increasing call for research on pre-conceptual interventions for improving maternal pre-pregnancy Body Mass Index (BMI), and that can influence adult height in order to benefit foetal growth. Other investigations into support for maternal nutrition could help programmers break the inter-generational cycle of undernutrition.

1. WHO/UNICEF/WB JCME (2017) It is also reported that the majority of the world’s wasted children and around two in five of all stunted children live in South Asia. In South Asia, WHO has declared wasting a critical public health emergency as a result of there being 27.6 million wasted children (with the regional prevalence of wasting 15.4%) and over 61 million stunted children. [↑](#footnote-ref-1)
2. Khara, T., & Dolan, C. (2014). **Technical Briefing Paper: The Relationship between Wasting and Stunting, policy, programming and research implications**. Emergency Nutrition Network (ENN) June 2014. <http://www.ennonline.net/ourwork/reviews/wastingstunting> Since the publication of this paper, follow up dialogue and research has been undertaken by a Wasting – Stunting Technical Interest Group (WAST-TIG) coordinated by ENN (funding from USAID-OFDA and Irish Aid), comprising around 30 individuals from a range of organisations (including academia and non-governmental organisations (NGOs)) with expertise in research and programming for wasting and stunting. The WAST-TIG have been focused on two main areas of work in 2016; re-analysis of data from the MRC Gambia and, cross sectional data from SMART surveys. A WAST-TIG Policy Practice Brief is anticipated later in 2017 (forthcoming). [↑](#footnote-ref-2)
3. See for example: Shoham J, Dolan C, Gostelow L, ENN (2013). **The Management of Acute Malnutrition at Scale:  A Review of Donor and Government Financing Arrangements.** Main Report. March 2013. <http://www.ennonline.net/enncmamfinancingreport2013> and Menon, P. and R. J. Stoltzfus (2012). **Building convergence in science, programmes, and policy actions on child undernutrition: symposium rationale and overview**. Adv Nutr 3(2): 224-226. The situation may be starting to change as these assumptions are challenged, some donors start to put in place more flexible funding facilities and the general focus in the sector is increasingly to support governments to develop more holistic nutrition planning to address all forms of malnutrition where these exist. [↑](#footnote-ref-3)
4. Note: According to the Global Report for Food Crises 2017 the following countries have similarly significant food insecure populations classified as IPC Phase 3 or above: Ethiopia (9.7 million); Afghanistan (8.5 million); Syria (7 million); Malawi (6.7 million); DRC (5.9 million); Sudan (4.4 million) and Zimbabwe (4.1 million). [↑](#footnote-ref-4)
5. UNOCHA June 2017 <http://www.unocha.org/nigeria> August 2017 [↑](#footnote-ref-5)
6. https://bmcpediatr.biomedcentral.com/articles/10.1186/s12887-016-0770-z [↑](#footnote-ref-6)
7. UNICEF/WHO/WB 2015 [↑](#footnote-ref-7)
8. <http://www.unocha.org/somalia> August 2017 [↑](#footnote-ref-8)
9. UNICEF/WHO/WB 2015 [↑](#footnote-ref-9)
10. As stated in latest March 2017 IPC and in the UN Humanitarian Needs Overview over 2 million GAM cases of which 462,000 SAM cases (HNO). However, given an estimated 3.5 million children under five (GNR 2015), this would imply well over 50% GAM which does not at all reconcile with the recent EFSNA findings which present most of the Governerates in Yemen as having GAM prevalence lower than the 15% humanitarian threshold [↑](#footnote-ref-10)
11. DHS 2013 [↑](#footnote-ref-11)
12. Note that Yemen, despite the appeal being highest, has the lowest overall EU allocation as compared to the other three countries. [↑](#footnote-ref-12)
13. Cannot be accurately calculated without data regarding number of children under five stunted in North East Nigeria [↑](#footnote-ref-13)
14. \*Angood C, Khara T, Dolan C, Berkley JA, WaSt Technical Interest Group (2016) Research Priorities on the Relationship between Wasting and Stunting. PLoS ONE 11(5): e0153221. doi: [10.1371/journal.pone.0153221](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0153221). [↑](#footnote-ref-14)