WFP/Shehzad Noorani, Bangladesh, 2017.

Discussion Paper

November 2017

Stunting in humanitarian and protracted crises

ENN

Irish Aid
Department of Foreign Affairs
An Roinn Gnóthaí Eachtracha

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Abbreviations

BCC	Behaviour change communication
BMI	Body mass index
BMS	Breast milk substitutes
ChroSAM	Chronic disease outcomes after SAM in Malawian children
CMAM	Community Management of Acute Malnutrition
CRAM	Community Resilience to Acute Malnutrition
DAC	Development Assistance Committee
DFID	Department for International Development
DHS	Demographic Health Survey
EED	Enteric enteropathy disease
ENN	Emergency Nutrition Network
FAO	Food and Agriculture Organization
FCAS	Fragile and conflict-affected states
FGR	Foetal growth restriction
FSAU	Food Security and Assessment Unit
GHA	Global humanitarian assistance
GNC	Global Nutrition Cluster
GNR	Global Nutrition Report
HAZ	Height-for-age Z-score
HFA	Height-for-age
HIV	Human immunodeficiency virus
IASC	Inter Agency Standing Committee
ICN2	Second International Conference on Nutrition
IDP	Internally displaced persons
iLiNS	International Lipid-Based Nutrient Supplements Project
IFPRI	International Food Policy Research Institute
INGO	International non-governmental organisation
IPC	Integrated Food Security Phase Classification
IFE	Infant feeding in emergencies
IYCF	Infant and young child feeding
JME	Joint malnutrition estimates
KII	Key informant interview
LBW	Low birth weight
LNS	Lipid-based nutrient supplements
M&E	Monitoring and evaluation
MICS	Multiple Indicator Cluster Survey
MNP	Multiple micronutrient powder
MQ-SUN	Maximising the Quality of Scaling Up Nutrition
MRC	Medical Research Council
MUAC	Mid-upper arm circumference
NCD	Non-communicable disease
NIE	Nutrition in emergencies
ODI	Overseas Development Institute
OECD	Organisation for Economic Cooperation an Development
PLW	Pregnant and lactating women
PSNP	Productive Safety Net Programme
REACH	Renewed Effort Against Child Hunger and Under-nutrition
REFANI	Research on Food Assistance for Nutritional Impact
RNI	Recommended nutrient intake
RUTF	Ready-to-use therapeutic food
SAM	Severe acute malnutrition
SD	Standard deviation
SDG	Sustainable Development Goals
SMART	Standardised Monitoring and Assessment of Relief and Transitions
SMS	SUN Movement Secretariat
SQ-LNS	Small quantity lipid-based nutrient supplements
SUN	Scaling Up Nutrition
TSGA	Term but small for gestational age
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNSCN	United Nations Standing Committee on Nutrition
USAID	United States Agency for International Development
WASH	Water, sanitation and hygiene
WaSt	Wasting/Stunting Technical Interest Group
WB	World Bank
WHA	World Health Assembly
WHS	World Humanitarian Summit
WFP	World Food Programme
WRA	Women of reproductive age

Executive Summary

Currently, the level of attention afforded to linear growth below international standards (stunting) in humanitarian and protracted emergency contexts is below what is needed, given the very high burden and prevalence of stunting in these contexts. A good deal of the policy, research and programming focus is directed towards the treatment of wasting in order to prevent excess mortality among children under five years of age. Yet stunting (both moderate and severe) can be highly prevalent in protracted situations, e.g. Syria, Yemen, Niger, Mali, and a considerable proportion of the global burden of stunting is located in these and other fragile and conflict-affected states (FCAS). Moreover, severe stunting is associated with a higher risk of mortality than moderate wasting, although knowledge of the causes of this elevated risk is limited. Evidence also suggests that being both stunted as well as wasted concurrently confers an even higher risk of mortality. It is likely that the drivers or underlying causes of stunting, if left unchecked, will lead to increases in the burden of stunting in FCAS and other crisis-affected contexts.

Historically the nutrition sector has adopted a somewhat 'siloed' approach towards programme, policy and financing between manifestations of undernutrition, with wasting viewed as predominantly occurring during emergency contexts while stunting is seen as a longer-term development issue, given its indication of chronic malnutrition, and with micronutrient interventions to some extent spanning the two. This is changing, however, with the Scaling Up Nutrition (SUN) Movement supporting the planning of nutrition policies and interventions across the full range of sectors and moving towards a more 'joined-up' and holistic view of undernutrition. Furthermore, the 'all-encompassing' Sustainable Development Goals (SDG) agreed in 2015 and the 'Grand Bargain' of 2016 call for 'a coordinated multi-stakeholder, multi-pronged and multisectoral approach' to programming. These international agreements are in line with the UNICEF conceptual framework of malnutrition, which remains relevant in that it conceptualises all forms of undernutrition (wasting, stunting and micronutrient deficiencies) as outcomes of the interplay of multiple overlapping factors.

In 2013, ENN conducted a review of the financing landscape for the scale up of treatment of acute malnutrition which highlighted the separation between funding for wasting and stunting. Since this work, ENN has been advocating for greater attention to be paid to the high levels of stunting often present in protracted crises and published a technical briefing note on stunting in protracted crisis in 2015. During 2016/17, ENN (with inputs from UNICEF) conducted an investigation into stunting in humanitarian and protracted crises to set the stage for policy and programming dialogues and greater advocacy to address evidence gaps and to ensure humanitarian response is in line with our increased global understanding of the causes and impact of stunting and its links to wasting. The investigation included a literature review and a series of key informant interviews (KIIs) with experts in the nutrition sector. This resulting discussion paper is organised into specific subject areas, including: levels and trends of stunting; architecture to support stunting reduction; causal pathways for stunting; assessment and response frameworks; impact/consequences of stunting; interventions to prevent and treat stunting (e.g. water, sanitation and hygiene (WASH) and diarrhoea control, use of specialised products, nutrition messaging, maternal nutrition, infant and young child feeding; the funding environment and where advocacy might be necessary to effect change.

The investigation aimed to build on 'joined-up' thinking, addressing some of the gaps in knowledge on stunting in humanitarian and protracted contexts, and asking whether a new objective is called for; namely that **a reduction in stunting (or at least no increase) should be viewed as a legitimate humanitarian goal in the same way that prevention and treatment of wasting is being seen as a legitimate development goal.**

This paper outlines the many difficulties of gaining a clear understanding of the needs and then mounting an effective nutrition response to tackle stunting in FCAS, which include:

- High (and in some cases, increasing) burden of stunting.
- Lack of routine reporting for severe stunting prevalence.
- Lack of clear assessment or monitoring data on stunting and difficulties in accessing vulnerable populations.
- Lack of evidence for the types of stunting prevention strategies that can be implemented across multi-sector programmes with short-term funding and in FCAS contexts.
- Lack of attention to maternal nutrition needs, despite the fact that the critical importance of the antenatal period to stunting in infants is well understood.
- Lack of evidence for the effectiveness of multi-sector interventions, particularly in humanitarian contexts, including how to 'stretch' the limited humanitarian funding to include interventions that reduce stunting along with those that prevent and treat wasting.
- Limited understanding of how to protect the 'development' gains in stunting reduction made pre-crisis in the context of intermittent or recurrent crises eroding the resilience of affected populations.

Although this investigation has raised more questions than can currently be answered, a number of ways forward are outlined below to be discussed during a series of discussions with individual experts and via an ENN webinar planned for early 2018. This will be followed by an ENN-hosted roundtable discussion, also in early 2018. The details underpinning these suggested ways forward are found in the main paper.

Nutrition principles and enabling architecture

Given the high burden of stunting in FCAS and the risk of deterioration in these contexts, it is clear that to meet SDG targets stunting prevention needs to be embedded in humanitarian response principles and standards and articulated clearly in global and regional nutrition agendas as well as FCAS country nutrition plans. In order to achieve this, it will be necessary to engage with multiple stakeholders at various levels. National governments of FCAS may need support to articulate how stunting reduction strategies and multi-sector plans involving emergency preparedness, risk reduction and resilience programming can help ensure stunting levels do not rise in a crisis. It will also be important to determine which pre-crisis interventions should be prioritised for protection during crisis situations, which are inherently more resilient during shocks, and which could continue effectively with some adaptation. A key objective must be to protect gains made pre-crisis.

A first step will be to convene a webinar involving a select group of actors able to identify key leverage points in the international architecture where evidence and advocacy should be directed. This will enable us to begin the process of embedding stunting prevention principles, policies, strategies and plans in crisis contexts. At global and regional level critical frameworks and initiatives include the SUN Movement, New Ways of Working and Zero Hunger, while at country level disaster preparedness, early response and resilience building as part of national nutrition plans will need to incorporate stunting prevention aims and related changes to monitoring and evaluation (M&E) systems.

Assessment, analysis, monitoring and response frameworks

Deeper analysis of existing datasets (DHS, MICS, UNHCR and country-level surveys) should be undertaken to provide clearer geographic and seasonal enunciation of the burden of stunting in FCAS and in crisis contexts. Some existing datasets may be useful to explore linkages between types and coverage of interventions and changes in stunting levels (e.g. UNHCR database for refugees). Furthermore, and recognising the complex set of underlying determinants of stunting, more comprehensive and systematic causal analysis is required during protracted crises on the potential drivers of stunting in the affected areas.

We also suggest that severe stunting prevalence and burden should be routinely highlighted alongside overall stunting in annual reports which are used to track country and global progress, e.g. routine population-based surveys (DHS, MICS), smaller-scale cross-sectional surveys (e.g. SMART) and the Joint Malnutrition Estimates (JMEs) and the Global Nutrition Reports (GNRs).

Ultimately, we need to be working towards a practical response framework which informs decisions about which interventions to prioritise in order to have maximum impact on stunting prevention in protracted

humanitarian crises. A starting point may be the framework used by UNHCR for refugee contexts. However, the variables to consider in any response decision tree outside of refugee contexts will vary enormously and will be highly context-specific, e.g. capacity of health and nutrition-related sectors and systems, types of crisis, major public health problems, etc. The feasibility of developing a credible response framework begs the question how evidenced such a framework need be and whether we currently have a sufficiently strong global evidence base to inform such a framework. Interventions that have shown to be most resilient to shocks (e.g. development gains that can be protected during subsequent crises) must be prioritised for inclusion in a response framework.

Interventions to reduce stunting

There is a growing body of work looking at the impact of nutrition-specific and nutrition-sensitive interventions (including multi-sector programming) on stunting. Much of this work is taking place in FCAS, although an unknown but substantial proportion of this work resides in project-specific studies, reviews and evaluations rather than peer-reviewed publications. Critical areas where the evidence base needs to be strengthened in FCAS for impact on stunting include interventions that tackle adolescent and maternal nutrition (considering the estimated 20 per cent of stunting occurring in utero), nutrition-sensitive agriculture, WASH and cash-based programming. Ongoing work in these areas needs to be mapped with a view to a systematic review. A review that separates out FCAS contexts would help inform a response framework for stunting prevention in humanitarian contexts and by definition provide context-relevant findings. The non-FCAS context findings could also help understanding of what elements need to be in place in order to have maximum impact on stunting prevention in any context. Furthermore, if the review considered both stunting and wasting prevention together it could help inform more integrated response frameworks.

WFP/Georgina Goodwin, Somalia,2017

Funding and advocacy

In order to progress a stunting prevention agenda in FCAS, a number of advocacy messages and approaches may be considered. This messaging can easily be built on the SUN 2 Road Map, Grand Bargain/New Ways of Working and can be predicated on a clear statement that it will be impossible to meet global SDGs and WHA targets without greater focus on stunting in FCAS.

This message can be further reinforced by an FCAS specific analysis of the cost of not intervening for stunting and the relative returns on investing in prevention. The risks of mortality associated with stunting (especially severe stunting and concurrent wasting and stunting) as well as the role of wasting as a risk factor for stunting must also be emphasised. The latter in particular speaks to the need for a greater consideration of joint nutrition objectives and outcomes (reducing the prevalence of both stunting and wasting) in FCAS and their periodic crises.

This ‘stunting-in-protracted crises’ agenda has many implications for international and national development partners and government. They include a realignment of financing mechanisms in FCAS during crises that provides greater support to programming that contributes to stunting prevention, e.g. multi-year funding, greater financing through government and local NGOs, and financing for system strengthening and surge capacity (health, social protection, risk minimisation programmes). In addition, nutrition actors need to consider shared analysis of needs and prioritisation of response across both humanitarian and development realms (the ‘nexus’). This may require an articulation of shared outcomes, geographical convergence and multisectoral actions to jointly address wasting and stunting. Finally, there needs to be greater accountability for stunting-reduction goals in crises and therefore advocacy for adherence to monitoring frameworks that include stunting prevalence, especially in protracted crisis situations, allowing results to be tracked over the long-term as well as in periods of more acute crises.

1 Introduction

Linear growth is widely regarded as the best overall indicator of children's wellbeing (de Onis & Branca, 2016). Currently very little attention is paid to the issue of linear growth below international standards (stunting) in humanitarian and protracted emergency contexts, with the focus of policy, research and programming directed towards treatment of wasting, micronutrient supplementation and infant feeding support to prevent excess mortality among children under five years of age. Yet prevalence of stunting (both moderate and severe) can be high in protracted situations, e.g. Syria, Yemen, Niger, Mali, and much of the global burden of stunting (up to 45 per cent) is located in these and other fragile and conflict-affected states (FCAS) (IFPRI, 2016). There is also a risk that the drivers of stunting, if left unchecked, will continue to lead to increases in the burden of stunting in crisis-affected populations, as seen in Niger and the DRC, where increased prevalence of stunting has been recorded since 1985. The positive gains in stunting reduction in countries like Yemen and Mali have been of a small magnitude for the same 25-year period (Black et al, 2013). The consequences of stunting on the ability of children to reach their full potential physically, mentally and economically are well documented; however it is less well known that some evidence suggests that severe stunting is associated with a higher risk of mortality than moderate wasting (weight-for-height<-2 and >=-3), although the understanding of this elevated risk is limited (Olofin et al, 2013).

Historically the nutrition community has adopted a 'siloed' approach on programme, policy and financing between manifestations of undernutrition; viewing wasting as predominantly occurring during emergency contexts, while stunting is viewed as a longer-term development issue, given that its indication of chronic malnutrition and micronutrient interventions spans both to some extent. This is starting to change, however, with the Scaling Up Nutrition (SUN) Movement supporting the planning of nutrition policies and interventions across the full range of sectors moving towards a more 'joined-up' and holistic view of undernutrition. Furthermore, the 'all-encompassing' Sustainable Development Goals (SDG) agreed in 2015 and the 'Grand Bargain' of 2016 call for 'a coordinated multi-stakeholder, multi-pronged and multisectoral approach'. These international agreements are in line with the UNICEF conceptual framework of malnutrition, which remains relevant (Smith and Haddad, 2015) in that it conceptualises all forms of undernutrition (wasting, stunting and micronutrient deficiencies) as outcomes of the interplay of overlapping factors.

Aiming to build on this more 'joined-up' view of undernutrition, ENN first conducted a scoping exercise on stunting in protracted emergencies in late 2015 (ENN, 2015). During 2016, ENN (with inputs from UNICEF) conducted a further investigation into the subject of stunting in humanitarian and protracted contexts with the aim of setting the stage for policy and programming dialogues and advocacy to i) address evidence gaps, and ii) ensure emergency response is in line with our increased global understanding of the impact of stunting and its links to wasting. The investigations into specific subject areas are presented here in the following sections, covering what we currently know about stunting (levels and trends of stunting, architecture to support stunting reduction, impact/consequences of stunting, causal pathways for stunting, assessment and response frameworks), interventions to address stunting (WASH and diarrhoea control, use of specialised products, nutrition messaging, maternal nutrition, infant and young child feeding), preparedness and resilience, and discussion regarding the funding environment. A series of next steps are suggested, which will be discussed further with individual experts and via a webinar planned for late 2017, followed by a roundtable discussion in early 2018.

2 Defining the context

Firstly it is useful to define the contexts which we are interested in and why. There is no one type of humanitarian crisis, yet it may be helpful to delineate between acute, rapid-onset, complex and protracted crises in a way which supports intervention choice and decision-making. In addition to the definitions of types of emergencies outlined in Box 1, several agencies, including FAO, DFID and WFP, have suggested definitions for protracted crises. Walton (2011) has described these as "situations where a large population is vulnerable to disease, death and disruption of livelihoods over a long period. These situations are often associated with conflict or states that have limited capacity to help those affected by crisis".

Protracted crises are becoming more common; in 2010, FAO estimated that 79 per cent of countries in food crises (19 out of 24) were classified as 'protracted' for eight of the previous ten years. In 2015 the Overseas Development Institute (ODI) highlighted that recurrent and protracted crises are distinct in important ways and that what is feasible and desirable in terms of increasing coherence between humanitarian action and development cooperation will differ significantly depending on the crisis context. Signalling the importance of typology in 2012, FAO described the features of complex emergencies, fragile states and protracted crises (see box 2).

While it can sometimes be difficult to separate a 'pure' humanitarian crisis from the longer-term, particularly when trying to decide when an acute crisis has turned into a protracted one, an important factor to consider the context pre-crisis. Unlike wasting rates, which have potential to rise or fall rapidly depending on the situation,

Box 1 Types of Emergencies *(source: World Health Organization[1])*

Sudden-onset Disaster	According to the World Health Organization (WHO), sudden-onset disasters are both "natural" disasters (e.g., earthquakes, hurricanes, floods) and manmade or "complex" disasters (e.g., sudden conflict situations arising from varied political factors), for which there is little or no warning. A disaster is defined by the United Nations Office for Disaster Risk Reduction as "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources." These events occur without time to complete a full evacuation.
Protracted crisis	The WHO and World Food Programme (WFP) define a protracted emergency, sometimes referred to as a slow-onset emergency, as "an extended disaster that takes a long time to produce emergency conditions, for instance natural disasters such as a drought or socioeconomic decline, which are normally accompanied by early warning signs."
Conflict or complex emergencies	A complex emergency, as defined by the WHO and Inter Agency Standing Committee (IASC), is "a humanitarian crisis in a country, region or society where there is total or considerable breakdown of authority resulting from internal or external conflict and which requires an international response that goes beyond the mandate or capacity of any single and/or ongoing UN country programme," (i.e., violence, political instability, security risks).

[1] Sourced from https://extranet.who.int/emt/faq/what-are-different-emergency-situations (accessed 1 August 2017).

WFP/Shehzad Noorani, Bangladesh, Cox's Bazar, 23 May 2017

the nature of stunting ensures that rates will not change quickly (in either direction), so if there are high rates of stunting pre-crisis, it can be safely assumed that these high rates will still be present and may well increase for months or years following onset of the crisis. The response (i.e. the mix of interventions) in relation to stunting may therefore need to be very different between areas where levels were high before the disaster compared to areas where it was low.

Box 2 Complex emergencies, fragile states and protracted crises (FAO, 2012)

There is a certain amount of overlap between complex emergencies, fragile states and protracted crises, but the classification of the situation is critical as it can have significant implications for policy and programming. For example, characterizing a situation as a complex emergency brings to the forefront humanitarian issues and often leads to a response led by the international community with an emphasis on emergency food assistance. In contrast, intervention in a fragile state focuses more on developing the state's capacity to deliver services to its citizens. Finally, intervention in protracted crises focuses on understanding and addressing longer-term issues and multiple causes at play in prolonged emergency situations.

Source: Alinovi L, Hemrich G & Russo L, eds. Beyond relief: Food security in protracted crises. Rugby, UK, Practical Action.

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3 Methods

This investigation was conducted between September and December 2016, was desk-based and used a combination of KIIs and a literature review.

A comprehensive contact list of relevant stakeholders was compiled at the start of the exercise in collaboration with UNICEF. Stakeholders were drawn from a variety of organisations, including UN agencies, INGOs, donors, academic research institutions and independents (see annex 1 for details of all individuals who participated in the KIIs). Interviewees were asked a series of questions outlined in annex 2 (each was asked to respond to the questions they felt most able or qualified to answer). Interviewees were also asked to provide resources (policy, guidance, academic papers, grey literature) which could contribute information to this review.

Other relevant papers, research and grey literature were sought through ENN's existing contacts network, discussion with the UNICEF team, online keyword searches[2] using Google, individual agency websites and the online libraries of platforms such as the CMAM Forum. A review of bibliographies and reference materials was conducted to identify key publications and systematic reviews relevant to the topic.

[2] Key word searches included: stunting, chronic malnutrition, undernutrition, humanitarian, emergency, FCAS, lipid-based nutritional supplements.

4 Limitations

While every effort was made to find all available literature relating to stunting, both in development and humanitarian settings, given the scope of the subject it is possible that some literature has been missed. In particular this paper did not aim to capture 'grey' literature from NGO programme reviews or evaluations, focusing instead on peer-reviewed literature and published guidelines. Some of the experts contacted were unavailable for telephone interview, so important viewpoints and opinions may have been missed.

WFP/Shehzad Noorani, Bangladesh, 2017.

5 Current levels and trends of stunting worldwide

Global levels of stunting remain very high, with nearly a quarter of children under five years of age estimated to be stunted[3] at any point in time (global prevalence of 23.2 per cent, which equates to approximately 156 million children under five years old). Over half the world's stunted children live in Asia and more than one third live in Africa. Five sub-regions[4], many of which are prone to crisis, have stunting rates of more than 30 per cent (UNICEF/WHO/WB 2017). Progress has been made in the reduction of stunting, but decreases in prevalence are uneven, with more gains seen in Asia (from 48 per cent to 25 per cent between 1990 and 2013) than Africa (42 per cent to 34 per cent) (De Onis & Branca, 2016). Due to population growth, the absolute numbers of stunted children in Africa is actually rising (e.g. four million more stunted children in Western Africa in 2015 than in 2000). High and middle-income countries have experienced the fastest reductions in stunting numbers, whereas low-income countries have more stunted children today (37.9 million) than 15 years ago (35.3 million) (UNICEF/WHO/WB 2017). Twenty six of these low-income countries are identified as FCAS by DFID (2015)[5] and/or as countries in protracted crisis by FAO (2010) (see annex 3). Annex 3 illustrates that levels of stunting in FCAS are frequently high, with 54 per cent of countries classified as FCAS having 'serious' or 'critical' levels of stunting as defined by WHO (>30 per cent of under-fives with low height-for-age), and 48 per cent with severe stunting levels in the same age group or >15 per cent. An increasingly large share of the global poor live in FCAS (Burt et al, 2014) and these are the same countries where disasters are increasing in frequency and severity (e.g. there have been three food crises in the Sahel in the past ten years, as opposed to one per decade before) (Carpenter and Bennett, 2015). Considering the well established links between stunting and income levels (in most countries, stunting prevalence among children younger than five years is about two and a half times greater in the lowest wealth quintile compared with the highest) (Black et al, 2013), stunting levels may well be expected to rise further.

In countries affected by conflict, stunting levels are becoming increasingly concentrated. The *Global Food Policy* report of 2015 outlined that over the past two decades, the number of stunted children in conflict-affected countries in the developing world increased from an estimated 97.5 million (equivalent to 46 percent of all stunted children in developing countries) to 112.1 million (equivalent to 65 percent). Furthermore in relative terms the child stunting rates in conflict-affected countries declined at a much slower rate compared with more stable countries. While many factors will affect stunting prevalence as well as the presence of conflict, the authors argue that building resilience to economic, environmental, and health shocks is even more important in conflict-affected countries than it is in more stable countries, to protect vulnerable populations (IFPRI, 2015a).

Tracking stunting levels is important not only because of the individual and community costs of the condition, but because stunting serves as a proxy indicator for human development. Stunting is a parameter for evaluating the quality of life of a population and is used for monitoring changes in economic and social standards (Hoddinott et al, 2013) and is increasingly being considered as a development indicator, over and above an indicator of chronic malnutrition[6]. At the World Health Assembly (WHA) of 2012, member states endorsed a set of six targets[7], including one for a 40 per cent reduction in stunting by 2025 (representing a total of 100 million stunted children aged under five in the world). According to the Global Nutrition Report (GNR)[8] of 2016, while substantial gains have been made in stunting reduction,

[3] Percentage of children aged 0-59 months who are below minus two standard deviations from median height-for-age of the WHO Child Growth Standards (includes moderate and severe stunting).
[4] UN identified sub-regions of Western Africa, Middle Africa, Eastern Africa, Southern Asia and Oceania.
[5] Personal communication

only 41 of the countries with data (132) are currently 'on course' to meet this stunting target. The majority of countries are 'off course' or have no data, including most of the countries classified as FCAS or currently experiencing protracted crises (IFPRI, 2016) (see Annex 3). We can already see from estimates that countries classified as FCAS are less likely to be on course to meet WHA targets than those in stable contexts (see Annex 3), with only eight FCAS countries currently 'on course'. It is also worth noting that the majority of the 34 'high stunting burden' countries identified by Lancet 2013 are also FCAS. Tackling the high (and in some cases increasing) stunting levels in FCAS is therefore critically important for future health and wellbeing of nations, not least to avoid the well documented costs associated with high stunting rates in a population.

As discussed below, an estimated 20 per cent of stunting occurs in utero and is manifest in children being born with low birth weight (LBW) or small for gestational age (SGA). Trends in these measures are therefore also very relevant for tracking stunting at global level. Although very limited information is collected at country level on these measures, where information is collected it is extremely worrying, with global estimates of LBW being between 15-20 per cent of all births. Regional estimates of LBW include 28 per cent in south Asia, 13 per cent in sub-Saharan Africa and nine per cent in Latin America (WHO, 2015a). Such high prevalence of LBW[9] supports the need to reorient all policy and programming relating to stunting to meeting the needs of mothers, as well as their infants.

Key points

- Most countries experiencing protracted crisis are 'off course' to meet WHA stunting reduction targets.
- Due to population increases, a growing number of children are stunted in Africa and in low-income countries in general.
- The number of stunted children living in countries experiencing protracted crisis is increasing proportionately.

[6] Stunting is often described as 'chronic malnutrition' as it is a process of the slowing of linear growth that is generally considered to reflect long-term exposure to nutritional stresses, which takes time to develop and is completely reversed only by a change in the conditions in which the child is 0living.

[7] The WHA has set six global nutrition targets (on stunting, wasting, low birth weight, anaemia, breast feeding and overweight/obesity) to be achieved by 2025. See www.who.int/nutrition/topics/nutrition_globaltargets2025/en/

[8] The GNR is 'in effect a report card on the world's nutrition and on efforts to improve it'. It assesses country progress towards the six WHA targets (through annual rates of reduction) and the extent to which donors, NGOs and businesses are meeting their commitments to improving nutrition

[9] The data on LBW remain limited or unreliable as many deliveries occur in homes or small health clinics and are not reported in official figures, which may result in an underestimation of the prevalence of LBW.

WFP/Shehzad Noorani, Bangladesh, 2017.

6 Nutrition principles and enabling architecture

Since 2010 and the launch of the Scaling Up Nutrition (SUN) Movement, there has been increasing global attention on nutrition issues, particularly on stunting reduction. The case that high levels of stunting have negative economic effects on populations and countries has been effectively made (World Bank, 2006; Hoddinot et al, 2013) and the SUN Movement has brought together donor and developing partner countries, UN organisations and agencies, civil society and business organisations to tackle undernutrition (and increasingly, overweight/obesity and non-communicable diseases (NCDs)). The focus of the SUN Movement is to increase political support for nutrition through advocacy and high-level champions and to develop costed, multi-sector, scale-up plans. Membership of the SUN Movement has grown since 2010; as of October 2017, 60 countries (which includes two states of India) have signed up as members. Currently 36 out of the 54 identified FCAS are signed up to the SUN Movement (see annex 3), although it has been reported that FCAS with poor economic indicators are less likely to join SUN, perhaps because membership does not automatically bring additional resources. This may dilute political interest in/commitment to the nutrition agenda in resource-poor countries with multiple competing priorities (Taylor, 2013).

SUN has adopted a multi-sector approach to addressing undernutrition through promotion of multi-stakeholder platforms that foster a combination of nutrition-specific and nutrition-sensitive interventions to reduce stunting. However ambiguities remain, particularly regarding the degree to which multi-sector or nutrition-sensitive programmes actually impact on stunting levels, although evidence is beginning to emerge (see section 6).

SUN has functioned to shine the spotlight on the importance of nutrition at both global and national levels; it has garnered political will and prioritised key issues. With the second phase (2016-2020) of the new strategy and roadmap launched in 2016, an opportunity exists to build on SUN achievements, especially at national level. There is acknowledgement among SUN partners that more emphasis is needed on FCAS (SMS partners' meeting, Geneva 2015) and to focus on implementation. The particular challenges to scaling up in FCAS were recognised and the need for more to be learnt about how to adapt what has 'worked' in stable contexts to FCAS, especially if state systems are weak or non-existent. Some learning of the main barriers to successful scale-up of nutrition programming in FCAS has been captured by the MQ-SUN project; actions to minimise these barriers are to be applied during Phase 2 of SUN[10].

In addition to the SUN Movement, at global level there are also the UN Standing Committee on Nutrition (UNSCN) and the UN Renewed Effort Against Child Hunger and Under-nutrition (REACH) programme. These focus on UN-level technical support and governance and coordination at country level respectively. Additional international frameworks to include a focus on stunting reduction are the Rome Declaration and the Framework for Action agreed at the second International Conference on Nutrition (ICN2) (FAO/WHO 2015) and the recently agreed Sustainable Development Goals (SDGs), which include the WHA target of 40 per cent reduction of stunting as an indicator for Goal 2. Target 2.2 defines the following goal: "By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons."

In terms of global architecture/agreements to support humanitarian programming, the 'Grand Bargain' was

[10] Based on its experience as a Technical Assistance (TA) provider to the SUN Movement in Phase 1, the MQ SUN project produced a briefing note summarising the three major barriers to nutrition scale-up in FCAS: i) Nutrition interventions tend to be short-term and focused on humanitarian approaches; ii) Actors in FCAS often lack the capacity to design and implement their own nutrition strategies due to reliance on external actors; iii) FCAS have weak state/society linkages, limiting the important role of civil society.

launched at the first World Humanitarian Summit (WHS) held in 2016 in Istanbul – a time of reflection for the humanitarian system, currently facing unprecedented levels and numbers of crises across the world (IASC, 2016). Further discussion of the Grand Bargain is provided in section 12 below, The funding environment.

The Global Nutrition Cluster (GNC) has been in place as a coordination mechanism for emergency response since 2006 as part of the humanitarian reform process, which aimed to improve the effectiveness of humanitarian response programmes by ensuring greater predictability, accountability and partnership. Once a cluster is 'activated' in-country, a country cluster coordinator is identified whose role is to coordinate actions and responses from international and local actors. Recent case studies of six cluster responses identified the tendency of the nutrition sector to have a 'default' response in humanitarian crises: assessment and treatment of acute malnutrition, infant and young child feeding (IYCF) and a focus on children under five years of age. The studies raised questions about how the Nutrition Cluster can best support a tailored response based on also assessing other vulnerable groups and forms of undernutrition, including stunting, in varying contexts (ENN, 2016a).

The same studies recognised that current mechanisms for nutrition cluster 'deactivation' once the crisis is resolved or becomes protracted need strengthening. There are challenges in transitioning from cluster support to other national coordination/sector support mechanisms, which are more likely focused on stunting. This may slow down or hinder access to appropriate international/development-focused support for stunting reduction.

Key points

- Most countries experiencing protracted crisis are 'off course' to meet WHA stunting reduction targets.
- Due to population increases, a growing number of children are stunted in Africa and in low-income countries in general.
- The number of stunted children living in countries experiencing protracted crisis is increasing proportionately.

WFP/Claire Nevill, Uganda, 2017

7 The impact/consequences of stunting

The evidence has been well articulated of the impact of stunting for individuals, households and communities; on future cognitive development and academic achievement, on reduced economic productivity and diminished lifetime earnings, and on future non-communicable disease risks. (Grantham-McGregor et al, 2007; Black et al 2013; Martorell and Young, 2012). One study found that children stunted in the first two years of life had poorer psychological functioning in late adolescence than non-stunted children (Walker, 2007)[11].

As a result of the above evidence and understanding of the long-term consequences of stunting, it has been a major focus of development actions particularly over the last decade. However it is rarely a focus in humanitarian situations as it is not considered 'life threatening', but we do know that being stunted (particularly severely) is associated with an elevated risk of mortality (Olofin, McDonald et al, 2013) (see table 1, below). However estimates of severe stunting are not routinely reported in annual estimates (e.g. joint malnutrition estimates, Global Nutrition Report), despite the WHO deeming severe stunting (height-for-age of less than –3 SD) a "life-threatening condition" (Webb et al, 2015). What is unclear is whether the overall mortality risk associated with being moderately or severely stunted is a result of being stunted itself or due to another factor associated with both stunting and mortality. Furthermore it is increasingly being recognised by groups working in this area that being stunted (height-for-age <-2SD) and the process of stunting (faltering in linear growth) are different things and likely to have different consequences; however they are seldom separated in research.

Table 1 Hazard ratio associated with anthropometric deficits *(Olofin, McDonald et al, 2013)*

	Wasted Mortality risk	Stunted Mortality risk
Severe	x 11.6 (C.I. 9.8-13.8)	x 5.5 (C.I. 4.6-6.5)
Moderate	x 3.4 (C.I. 2.9- 4.0)	x 2.3 (C.I. 1.9-2.7)

There is growing interest in the interaction between wasting and stunting and ENN has been coordinating a body of work to better understand this. Discussion and analysis resulting from this work point to a strong association between the two in their relationship to mortality; i.e. when wasting and stunting are experienced in isolation they are associated with a moderately increased risk of death, whereas when experienced concurrently they are associated with a very high risk of death (12.3 times that of a child without anthropometric deficits) (McDonald et al, 2013). This is comparable to that observed in children with severe wasting (see table 1).

The elevated mortality risk for children both wasted and stunted concurrently led ENN to carry out an analysis of 84 DHS/MICS country datasets to estimate the prevalence and burden of this condition. This analysis has shown that the prevalence of children concurrently wasted and stunted varies between countries within a range of zero and eight per cent, with nine countries reporting a prevalence greater than five per cent. The total burden of these highly vulnerable children (aged 6-59 months) in the 84 countries is estimated to be close to six million. As these are cross-sectional datasets, this burden is likely to be an underestimate[12] (Khara et al, 2017).

[11] A forthcoming paper (as a complement to the study by Danaei et al, 2016 described in section 8) will use similar methodology to examine four psychosocial risk factors for stunting.

[12] Much of the evidence for the associations between wasting and stunting particularly at population level use cross sectional data, which can be problematic as wasting is more acute, has a relatively shorter duration and is generally more reversible than stunting; therefore the use of prevalence rather than incidence for wasting is likely to underestimate the actual annual wasting burden.

Key points

- The impact of stunting on individuals, communities and populations in terms of cognitive and economic development and non-communicable disease is well documented.
- Prevalence of severe stunting is not routinely reported in annual estimates e.g. JMEs, GNRs.
- Stunting, particularly severe stunting and stunting in combination with wasting, is associated with heightened mortality.
- We therefore need to consider placing a greater focus on *preventing any increase in stunting levels during protracted crises;* both as a strategy to reduce mortality and to ensure that hard-won and expensive gains in reducing stunting levels are not lost.

WFP/Shehzad Noorani, Bangladesh, 2017.

8 Causal pathways for stunting

A recent comparative risk assessment of 18 identified risk factors for stunting in 137 countries found that the leading risk factor for stunting worldwide is foetal growth restriction (FGR), defined as being term but small for gestational age (Danaei et al, 2016).

The in utero period is estimated to determine 20 per cent of the overall burden of stunting[13] (Black et al, 2013; IFPRI, 2015). Recent evidence suggests that stunting (and the effect on its functional correlates of cognition) may actually begin as early as conception (Prendergast and Humphrey, 2014). The season of birth seems to matter as well, linked to both the intrauterine environment and the birth environment with the impact of seasonality acting as both a cause and a risk factor (Nabwera et al, 2017). There is strong evidence underlining the importance of the nutritional status of women at the time of conception, during pregnancy and through lactation as a crucial factor in the survival, healthy growth and development of her children (Lassi et al, 2013).

The other two main risk factors identified in the Danaei study were unimproved sanitation[14] and diarrhoea, respectively. These results build on the emerging evidence for the links between WASH and undernutrition. We know that frequent episodes of diarrhoea in the first two years of life increase the risk of stunting, which can then impair cognitive development (Grantham-McGregor et al, 2007; Victora et al, 2008, Black et al, 2013), and that as children have weaker immune systems it means they are more susceptible to enteric infections, leading to more severe and prolonged episodes of diarrhoea (Caulfield et al, 2004). Given its chronic nature, Prendergast and Humphrey (2014) argue that stunting should be viewed as an inflammatory disease partly arising from primary gut pathology. Since gut damage also occurs with recurrent (especially persistent) diarrhoea, severe acute malnutrition, HIV infection and micronutrient deficiencies, they go on to suggest that growth failure arising from enteric enteropathy disease (EED) may be exacerbated due to multiple overlapping causes of enteropathy in settings of poverty.

The authors of the comparative risk factor analysis concluded that a large proportion of childhood stunting in developing countries (including many countries identified as FCAS) could be prevented if exposure to a few risk factors could be eliminated (Danaei et al, 2016). This is not to deny that more evidence is needed about the process of stunting. Many proximal risk factors for poor child growth have been identified through clinical trials and observational studies; however we do not yet fully understand what impact these factors have on stunting in individual populations and therefore which pathways we need to prioritise and address in order to prevent or arrest the process of stunting once it is in motion in a particular context. The mediating role of risk factors in FCAS and other

Definitions of small for gestational age and low birth weight

SGA: Having a birth weight below the 10th percentile for the gestational age.

LBW: Having a birth weight less than 2500g (5.5 lb).

[13] It is also possible to consider low birth weight as being a manifestation of in utero wasting.

[14] Unimproved sanitation was defined as a lack of access to safe sanitation in the community. This was based on the WHO/ UNICEF Joint Monitoring Programme for Water Supply and Sanitation (which provides specific definitions of improved water and sanitation) definition of improved sanitation: *flush toilet, piped sewer system, septic tank, flush/pour flush to pit latrine, ventilated improved pit latrine, pit latrine with slab, composting toilet, and flush/pour flush to unknown place.*

crisis contexts is even less clear as very little has been documented on how levels of stunting (i.e. through which nutrition-specific and nutrition-sensitive interventions) have been reduced, where this has happened.

There is also increasing interest in the overlap between risk factors for wasting and for stunting. An analysis conducted in 2012 failed to identify risk factors for wasting that were not also risk factors for stunting (Martorell and Young, 2012). This is complicated by emerging evidence of a negative association between periods of wasting and subsequent linear growth (Richard et al, 2012); i.e. of wasting as a risk factor for subsequent stunting[15] and the identification of potential physiological mechanisms for this (Briend et al, 2015). Seasonal patterns of peaks in stunting following peaks in wasting have also been observed in a number of contexts, although seldom documented (Brown et al, 1982). Although a weaker association is also found between stunting and subsequent wasting, more analysis is needed to understand this.

[15] For more information, see: http://www.ennonline.net/mediahub/wastingandstuntingprogress

Key points

- Comparative analysis points towards important risk factors for stunting (in particular maternal nutrition status); however contextual analysis is essential in order to prioritise accurately the most appropriate interventions for a particular population.
- The overlap between risk factors for wasting and stunting suggests common approaches for prevention are justified.

FAO/IFAD/WFP/Michael Tewelde, Ethiopia, Somali Region, 2017

9 Stunting in assessment, analysis, monitoring and response frameworks

The KII respondents reported that generally much less attention is given to stunting data compared to wasting data in FCAS, both for assessing the situation and determining the response. Stunting is not routinely monitored during humanitarian crises. An exception to this is in refugee camp populations, where UNHCR both measures and monitors stunting trends and includes stunting levels in its response framework for selection of interventions (see below).

More generally, height-for-age (HFA) measurements (and moderate and severe stunting prevalence) are included as standard in SMART nutrition surveys, the commonly used tool for nutrition assessment in protracted crisis. However these data are seldom used and their quality is questionable; height measurements can be difficult to undertake and age estimates tend not to be very reliable (although in refugee camps there is usually good birth registration so estimates of age are generally more accurate). In general, plausibility checks are conducted on the HFA data, but these rarely get reported (and tend to be buried in survey reports). There can, of course, be considerable difficulties with accessing vulnerable populations in humanitarian and protracted crises for assessment in general so, as for other indicators, results may not be representative.

Data from national-level surveys such as DHS and MICS can sometimes be too aggregated to be useful at sub-national and district level. Stunting levels tend to vary across countries and regions and can be concentrated in pockets. For example, according to the 2013 DHS survey in Sierra Leone, the percentage of children under five years old with an HFA <-2 SD ranged from 51.6 per cent in Kono District to 28.2 per cent in Bombali (SSL, 2014); however these surveys will provide a baseline from which to work if an acute crisis occurs. Note that timing of surveys is important as in settings of seasonal variations in growth, wasting and stunting levels can vary according to season (Brown et al, 1982, Nabwera et al, 2017). Further information may be available through nutrition surveillance systems, such as the Food Security and Nutrition Analysis Unit – Somalia (FSNAU). Some agencies have data available to analyse; in particular UNHCR holds a database of surveys conducted in refugee camps and some analysis of stunting trends (along with anaemia) is underway. Stunting prevalence has been incorporated into the food security analysis of the 'IPC Chronic'[16], which in due course will provide an opportunity to analyse trends of stunting prevalence in protracted crises contexts.

In terms of current 'trigger' levels for response, WFP indicates through its Protracted Relief and Recovery Operations (PRRO) programmes that where stunting is >30 per cent or in high-risk situations, food-based prevention of stunting is indicated[17]. UNHCR uses a simplified version of the WHO criteria with programming actions linked to high (>30 per cent) stunting levels. WFP's main focus for the prevention of stunting is through complementary feeding interventions for children using special nutritious foods (WFP, 2014). UNCHR's global strategy (2014-18) has a specific objective of preventing undernutrition, including reducing the prevalence of stunting to <20 per cent in children aged 6-59 months, focusing on a product-based

[16] The Integrated Food Security Phase Classification (IPC) is a global, multi-partner initiative to facilitate decision making with improved food security analysis. It consists of a set of tools and protocols for classifying the severity and nature of food insecurity that integrates food security, nutrition and livelihood information into a clear statement about the nature and severity of food insecurity and implications for response. IPC incorporates a meta-analysis approach, drawing on evidence-based analysis that includes a broad range of datasets and stakeholders. The IPC Chronic Food Insecurity Classification (IPC Chronic) has been designed to complement the IPC Acute Food Insecurity Classification and provide crucial information for strategic and interlinked food security programming and policies that focus on medium and long-term objectives.

[17] Of note is that WFP's new strategy is a move away from use of PRROs and Emergency Operations (EMOPs) to country-level strategic planning cycles.

approach and complementary actions (e.g. improving IYCF practices) and multi-sector programming.

Recognising the considerable timeframe constraints in measuring and achieving reductions in stunting prevalence, a possible alternative is to track changes in indicators that measure key identified drivers of stunting in the particular context (e.g. if diarrhoeal disease has been identified as a key driver of stunting in this area, track any reductions in incidence due to interventions rather than try to track reductions of stunting prevalence per se).

Key points

- Quality of measurements (both height and age) is a challenge for the assessment of trends in stunting.
- However, led by the example from UNHCR, there is a move towards taking account of stunting levels as part of contextual analysis and response planning in protracted crises.
- Opportunities exist for looking further at trends in stunting in protracted crisis, especially in refugee populations.
- Given the time taken to significantly reduce stunting prevalence, an alternative could be to track changes in indicators that measure key identified drivers of stunting.

WFP/Saikat Mojumder, Bangladesh, 2017

10 Interventions to reduce stunting

While 'stunting treatment' remains an untested intervention with no defined protocol or strategy, efforts to prevent stunting from occurring in the first place continue to take centre stage. The Maternal and Child nutrition Lancet series of 2008 and 2013 reviewed available evidence and proposed a list of ten nutrition-specific interventions to address undernutrition (see Box 3), which should be coupled with nutrition-sensitive approaches. However, stunting is not an area of programmatic response focus in acute or protracted humanitarian contexts and UNHCR is one of the few agencies that has developed guidance on how to prevent stunting in refugee populations.

Box 3 *Lancet* 2013; Ten evidence-based recommended 'nutrition-specific' interventions[18]

Optimum maternal nutrition during pregnancy
- Maternal multiple micronutrient supplements to all.
- Calcium supplementation to mothers at risk of low intake.
- Maternal balanced energy protein supplements as needed.
- Universal salt iodisation.

Infant and young child feeding
- Promotion of early and exclusive breastfeeding for six months and continued breastfeeding for up to 24 months.
- Appropriate complementary feeding education in food-secure populations and additional complementary food supplements in food-insecure populations.

Micronutrient supplementation in children at risk
- Vitamin A supplementation between 6 and 59 months age.
- Preventative zinc supplements between 12 and 59 months of age.

Management of acute malnutrition
- Management of moderate acute malnutrition
- Management of severe acute malnutrition

There is general agreement (as evident during the KIIs) that, while we don't yet understand fully the reasons why some children become wasted while others become stunted or both, we do think that prevention activities, done well, will likely help prevent either or both forms of undernutrition (possibly at the same time). Prevention activities thereby offer an ideal opportunity to implement 'holistic' programming to prevent wasting and stunting. A recent study showed that nutrition education and counselling, growth monitoring and promotion, immunisation, WASH and social safety net programmes appear to be the most commonly included interventions of an effective package to address stunting in most low and middle-income settings and that in all settings a combination of interventions was associated with success when they included health and nutrition outcomes and social safety nets (Hossain et al, 2017).

Prevention programming in stable contexts usually consists of a range of nutrition-specific interventions and nutrition-sensitive approaches, from food fortification to increasing dietary diversity. It is well understood that good formative research/analysis in each context is important to identify the drivers of stunting in a particular context and the barriers to making shifts in those drivers. A belief expressed in many of the KIIs was that the majority of prevention activities will not be successful in the short-term and practitioners usually need to take the long view; it takes considerable time to strengthen market access to diversify diets, put in place the structural changes needed to support positive infant feeding practices, improve antenatal care and facilitate shifts in behaviours. If this premise holds true, then prevention activities in humanitarian situations where the majority of programming is short-term in nature is difficult to implement. However, simple activities such as promotion of handwashing can still be useful. (It will be interesting to see if the near-universal handwashing

[18] If implemented at 90 per cent coverage, these are estimated to reduce mortality by 15 per cent, stunting by 20 per cent and wasting by 60 per cent.

Box 4 *The iLiNS Project*

The **International Lipid-Based Nutrient Supplements (iLiNS) Project** is a research collaboration aiming to further develop the evidence base for the use of lipid-based nutrient supplements (LNS) to prevent undernutrition in vulnerable populations.

Four randomised trials have been implemented in Ghana, Malawi and Burkina Faso (the latter with zinc therapy included) to evaluate the impact of providing small quantity lipid-based nutrient supplements (SQ-LNS) to PLW and infants and young children. The objective of the trials was to assess the impact of SQ-LNS on birth outcomes (birth weight, length and head circumference), as well as child growth and development outcomes at 18 months.

The results of research were heterogeneous. Impact on child weight and length of children (at 18 months) was seen in Ghana but not Malawi; impact on birth outcomes was seen in both Ghana and Malawi (infants were heavier, longer and had larger head circumference at birth), but impact on birth size of infants born to first time mothers was only seen in Ghana.

practices adopted by populations in Ebola-affected countries in West Africa can be maintained and, if so, what effect this will have on reducing the transmission of infection and potentially improving nutrition outcomes.) It is also possible that some interventions that can reduce or prevent an increase in prevalence of stunting (for example, WASH and cash-transfer programmes) can indeed be mounted quickly. More understanding is required on what interventions can be realistically launched and implemented within the timeframe of short-term humanitarian funding, in which contexts, and what expertise and oversight is needed from across the sectors. We also need to explore the effects on stunting levels that can be realistically expected in the timeframes.

The need for innovation in approaches to prevention was frequently mentioned in the KIIs, with some suggesting a paradigm shift was required, in order to 'shake up' prevention efforts and stimulate donor and programmer interest in addressing prevention activities for all manifestations of undernutrition.

10.1 WASH and diarrhoea control

For programming in FCAS the evidence on causal pathways noted above suggests that WASH interventions and diarrhoeal disease control are two important areas for stunting prevention and reduction. They also happen to be two standard interventions in humanitarian settings (Sphere 2011). Observational studies have confirmed the intuitive belief that contaminated water, poor hygiene and contaminated areas where there are mobile infants/toddlers will lead to increased incidence of infections, particularly diarrhoeal diseases (Prendergast and Humphrey, 2014). However, a systematic Cochrane review of WASH interventions (assessing randomised controlled trials only) showed mixed results, with only suggestive evidence that WASH interventions improved linear growth slightly (Dangour et al, 2013). A great deal of research is currently ongoing, with results of large WASH trials in Zimbabwe, India and Bangladesh expected to be released shortly.

10.2 Use of specialised nutritional products

One of the main reasons for the stellar success of the CMAM approach was having an effective product: children could rapidly recover from even the most severe cases of (uncomplicated) SAM and this could be achieved for the vast majority on an outpatient basis and with mortality rates considerably lower than previous intervention modalities.

The success of the CMAM approach, which uses an effective product (ready-to-use therapeutic food (RUTF) that can be safely stored and used at community level has triggered the development of a host of new products. This has included research to investigate the possibility of products being used for the prevention of stunting in certain contexts. Where the prevalence of stunting and/or micronutrient deficiencies pre-crisis is already high, protecting the youngest children from further nutritional deficiency is argued to be an important consideration for providing specialised nutritional products to children aged 6-24 months as well as pregnant and lactating women (Webb et al, 2014). However many gaps remain in our understanding of both the type of product and the optimal dosage to use in order to promote linear growth and address micronutrient deficiencies (WHO is in the process of conducting a scoping study into nutritional products for all types of undernutrition). The largest body of research to date has been led by the iLiNS Project (see box 4 for details).

The heterogeneity of the iLiNS trial results means that more investigation into the role of SQ-LNS in preventing stunting is required. The project authors confirmed the

view of many KII respondents that while specialised products can help to address micronutrient deficiencies, they are unlikely to be sufficient (when used alone) to achieve sustained responses in child growth and development, and that adequate access to healthcare and/or better sanitation and hygiene are needed in combination[19]. This finding is unsurprising, given the multidimensional causes contributing to undernutrition.

A study was conducted in 2015 assessing the effectiveness of blanket distribution of nutributter on reducing the prevalence of anaemia and stunting in refugee camps in the Horn of Africa. While impact was seen for anaemia reduction, the intervention had no effect on stunting prevalence in children aged 6-23 or 6-59 months (Style et al, 2015). UNHCR produced operational guidance in 2011 (with addendum in 2014) on the use of specialised nutritional products in humanitarian and development contexts to help address inadequate nutrient intakes from low-diversity diets common in refugee and IDP populations. This operational guidance was evaluated in 2013 and recommended continued assessment of the impact and use of special nutritional products in humanitarian contexts, including acceptability and adherence, effectiveness and cost-effectiveness (Style et al, 2013). Most of the products currently in use for stunting prevention (such as SQ-LNS) have been formulated to be deliberately less calorie-dense as high-calorie, lipid-dense products such as RUTF are not appropriate for stunting prevention. As Webb et al (2014) state: "While any assessment of relative risk would always prioritize the relative risks of mortality versus chronic diseases, there are some suggestions, for example, that some food aid dependent populations in refugee camps may develop overweight and obesity (Grijalva-Eternod et al, 2012), and that diabetes and other non-communicable diseases are no longer minor concerns in such vulnerable populations (Federation of Red Cross, 2011)."

As Grijalva-Eternod et al (2012) explain, "food assistance programs that are suitable for acute emergencies may not be suitable for extended emergencies."
Even if specialised products are found to be effective for tackling stunting, the difficulties of taking them to scale are likely to be many, including the expense of purchase, transport and distribution. CMAM scale-up has in part been constrained by the expense of the product (Shoham et al, 2013) and if we consider the very high absolute numbers of children in countries where there is a high prevalence of stunting, it seems that scaleability of product use will be a challenge, although it may be possible to fund use sufficiently at scale in short-term, acute humanitarian responses. Where products might have an increasing role is through social safety net programmes (cash or voucher) to help improve micronutrient status of individuals and families. In refugee camps there is rarely sufficient market access and availability of fresh food to ensure sufficient dietary diversity and intake, so products will likely continue to have a role in supplementing household rations and food baskets. A study comparing LNS and multiple micronutrient powders (MNPs) in refugee children and pregnant and lactating mothers in Algeria found higher acceptability, consumption and adherence in participants receiving LNS compared with MNPs (Tondeur et al, 2016). Further studies assessing the effectiveness of LNS in reducing micronutrient malnutrition (particularly anaemia) are warranted.

10.3 Nutrition messaging

Some FCAS do have stunting reduction strategies that include comprehensive behaviour change communication (BCC) activities in place (e.g. Ethiopia, Bangladesh, Nepal). However, during crisis situations when registration/distribution sites are set up (e.g. cash or supplementary feeding) activities for 'prevention' of malnutrition often reduce BCC activities to a series of nutrition messages developed for 'normal' times. Humanitarian nutrition programming tends to be implemented in 'campaign style', when it is difficult to deliver effective nutrition-specific messaging (at the distribution site, for example). Many of the messages are unlikely to remain appropriate given the changed context (e.g. deterioration in food security, increased burden of survival activities) and in addition this kind of message delivery is unlikely to have the desired effect. How much of this messaging is done because of donor requirements, rather than because implementers feel it will be successful? To have more effective communication of the messages themselves, the model, the delivery (e.g. many rely on intensive volunteer efforts for free, which is unrealistic over the longer-term in protracted crises) and target groups (e.g. those with

[19] http://www.ilins.org/ilins-project-research/insights/iLiNS%20Project%20-%20key%20results%20to%20date-%20Rome-%2025%20Mar%202015.pdf

[20] Nutributter® (Nutriset, Malaunay, France), is an SQ-LNS designed for 'point of use' or 'home fortification'. It provides a range of vitamins and minerals as well as energy, protein and essential fatty acids, differentiating it from multiple micronutrient powders and tablets. It is made from peanuts, sugar, vegetable fat, skimmed milk powder and vitamin and mineral fortificant.

influence and power within the family may change), need to adapt. We need to ask questions such as: What is the impact of nutrition messaging in contexts where food security is the main driver of malnutrition? What agency do target households actually have during humanitarian crises? Can many of the messages be acted upon? What (of the many) other prevention activities should we be focusing on, as well as nutrition messaging?

Another question is how well can we currently monitor and assess the impact of any nutrition education activities? For example, do we have indicators that effectively measure the quality of the nutrition counsellor, or is this one of the many bottlenecks?

More evidence is required concerning where and if nutrition education/messaging works and whether these approaches have any traction in different humanitarian contexts.

10.4 Maternal nutrition

As noted above, the in utero period has been identified as determining a significant proportion of childhood stunting. A study by Liu et al (2017) identified that prenatal care utilisation, while not related to infant birth weight, was associated with important outcomes later in life, specifically higher height-for-age at 24 months and higher attained school grades. Gough et al (2016) suggested that transgenerational effects are an important determinant of growth trajectories, and interventions targeting pregnant mothers and girls entering their reproductive years are required for normal infant growth. It is unclear why there continues to be a lack of attention to maternal nutrition despite a wealth of evidence, including the *Lancet* series of 2013 highlighting the importance of adolescent and maternal nutrition for the health of the mother and healthy foetal growth and development. Nutrition initiatives have focused to date mainly on the infant and child. It is all too common to neglect the significance of women's own nutritional status, even though pregnancy represents a critical part of the 1,000-day 'window of opportunity'; of the 1,000 day period, the first 280 days of pregnancy (or 28 per cent) is largely being neglected, both at policy and programmatic level.

During humanitarian crises, maternal nutrition needs are not well served, with difficulties arising during assessment, targeting and interventions. Measurement of nutritional status of women of reproductive age is often included in national MICS and DHS surveys; however body mass index (BMI) measurements are used, which can be problematic for estimating the prevalence of undernutrition in women, particularly if they are pregnant. Targeting of PLW in humanitarian situations is usually conducted through use of mid upper arm circumference (MUAC) due to its relatively strong association with LBW, narrow range of cut-off values and simplicity of measurement. Knowledge of gestational age is also not required with MUAC, although currently there are wide variations in the 'cut offs' being used at programme level. A global mapping exercise undertaken by WFP in 2012 highlighted that the most widespread direct nutrition interventions for maternal nutrition in humanitarian contexts are supplementary feeding of PLW (either targeted or blanket) and micronutrient supplementation, with the WFP product Supercereal[21] most commonly used. There is limited understanding of how much of the ration the mother will actually consume herself, as opposed to sharing it with the family or any substitution effect. Routine performance monitoring and impact of maternal supplementation programmes is lacking, with the majority of programmes discharging women either when the 'baby is born' or the 'baby reaches six months' (although it is acknowledged that there is lack of agreement on what measures we should be monitoring – outcomes for the woman or for the infant).

The move to cash/voucher programming potentially offers opportunities to improve maternal targeting and delivery mechanisms, but as yet there is limited understanding of how to harness this most effectively. One area where cash/voucher programming and other modalities may be harnessed to improve targeting and delivery is for micronutrient supplementation for women of reproductive age (WRA). Micronutrient deficiencies in WRA are extremely common and firmly linked to incidence of stunting. In 2011 it was estimated that 29 per cent (496 million) of non-pregnant women and 38 per cent (32.4 million) of pregnant women aged 15-49 years were anaemic (WHO, 2015b) and many of these women will reside in FCAS. Maternal anaemia has an impact on the risk of LBW and preterm birth in low- and middle-income countries, while in low-income countries, 25 per cent of LBW was attributable to maternal anaemia during pregnancy (WHO 2015b), with the associated impact on stunting prevalence, described

[21] A corn/wheat/rice soy blended food fortified with vitamins and minerals and providing 752-939 kcal, 31-38g protein (16 per cent), 16-20g fat (19 per cent) per 200g daily ration.

above. During humanitarian situations, WHO (2012) recommends the provision of iron and folic acid for pregnant women based on strong evidence on the reduction of incidence of anaemia, risk of LBW and risk of neonatal and under-five mortality. WHO also recommends provision of the UNICEF/WHO micronutrient supplement for PLW providing one recommended nutrient intake (RNI) of micronutrients daily (including 27 mg iron), whether or not they receive fortified rations, in addition to the iron/folate supplements (WHO 2015b).

10.5 Infant and Young Child Feeding

Infant and young child feeding (IYCF) practices that contribute to stunting include suboptimal breastfeeding (specifically, non-exclusive breastfeeding) and complementary feeding that is limited in quantity, quality and variety (WHO 2015). It is well-known that improvements in exclusive breast feeding rates and complementary feeding practices will reduce mortality amongst infants and young children (Lancet ref). Interventions to improve IYCF practices are therefore critical for the prevention of stunting. IYCF interventions are necessary during humanitarian crises where achieving recommended IYCF practices can be particularly challenging and the risks of suboptimal practices heightened. Early initiation and exclusive breastfeeding for six months provides active protection against gastrointestinal infections that can lead to severe nutrient depletion and therefore stunting (WHO 2015). Infants and young children who are not breastfed require adequate, safe and sustained nutrition to meet their needs, protected from marketing influences[22]. Enhancing children's diet through improved complementary feeding practices will also help prevent stunting. Evidence suggests that greater dietary diversity and the consumption of foods from animal sources are associated with improved linear growth (WHO 2015). The necessity and responsibility to intervene to protect and support breastfeeding; to meet the needs of non-breastfed infants, and to enable safe, appropriate complementary feeding for all children in emergencies is reflected in key strategies and policies (WHO, 2004; IFE Core Group, 2017). The recently updated Operational Guidance on Infant and Young Child Feeding in Emergencies identifies multi-sectoral responsibilities and actions in emergency preparedness, response and recovery to maximise child nutrition, health and development. (IFE Core Group, 2017).

[22] *The International Code of Marketing of Breast-milk Substitutes*. WHO,1981 **and subsequent relevant World Health Assembly Resolutions (*the Code – see definition*)**. Arabic, English, French, Spanish and many others. http://ibfan.org/the-full-code
The International Code of Marketing of Breast-milk Substitutes was adopted as a global public health strategy by the World Health Assembly in 1981. The code recommends restrictions on the marketing of breastmilk substitutes, such as infant formula, to ensure that mothers are not discouraged from breastfeeding and that substitutes are used safely if needed.

WHA Resolution: Guidance on Ending the Inappropriate Promotion of Foods for Infants and Young Children. 69th WHA A69/7 Add.1. 2016. English. *Covers commercially produced foods and beverages, including complementary foods marketed as suitable for feeding children up to 36 months of age.*
http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_7Add1-en.pdf

Key points

- At present the evidence base is weak (and weaker still for protracted contexts) regarding impacts at scale of intervention 'packages' to prevent stunting.
- Maternal nutrition is not currently well served in humanitarian programming (standardisation of identification, effectiveness of treatment, monitoring, etc.). More attention needs to be paid to maternal nutrition issues if we are to influence stunting reduction.
- While innovations are needed, we may be missing opportunities in humanitarian contexts to utilise the well articulated range of nutrition-specific and nutrition-sensitive approaches common in development/stable contexts
- It is possible that different approaches are needed according to whether stunting levels are high or low and whether trends are reducing, increasing or showing stagnation.

11 Preparedness/resilience

A key strategy in FCAS surrounds the issue of preparedness. The costed national nutrition plans that countries have been developing with encouragement from the SUN Movement offer an opportunity to ensure that these plans include emergency planning. Stunting-reduction strategies offer another route for preparedness planning and the development of these should be a priority for countries with high rates of stunting (particularly those with 'serious' and 'critical' levels of stunting; > 30 per cent and 40 per cent respectively). It is important to remember that while prevailing insecurity in an FCAS poses additional challenges, it does not preclude effective government. Partners should proactively seek ways to build government and governance from the early stages of intervention even in conditions of instability and ongoing conflict (Taylor, 2013).

Key elements of stunting-reduction strategies for FCAS will be to ensure that policies and legislation are articulated and in place before any crisis occurs, as preparedness. Many of these policies will be nutrition-specific, such as endorsement and application of the International Code of Marketing of Breast-milk Substitutes ('the Code', see footnote 22), provision for maternity leave, etc. It is common following natural disasters for donations of infant formula powder to be sent to the affected country (Panlilio, 2008) which are generally not suitable for several reasons, including being of variable quality and not meeting Code requirements. If the Code is already in place, it will be much easier for governments and operational agencies to refer to it when managing these donations. This example also illustrates the importance of protecting the gains made during periods of stability in FCAS; promoting breastfeeding is one of the Lancet ten key interventions and is therefore often a key feature of nutrition programming. When a new (or resurgent) crisis occurs, it is vitally important to avoid the undermining of breastfeeding promotion efforts that have been implemented, not least to protect the gains made and to protect the investments made during periods of relative stability.

The resilience agenda is particularly important when looking at programming that can bridge the humanitarian and development divides; the recent focus on strengthening resilience has prompted new thinking on better integrating approaches based on a common understanding of risk (Carpenter and Bennett, 2015). The resilience agenda is not as mainstream across nutrition yet as in other sectors and arguments have been made against the isolation of 'nutrition resilience' as a distinct approach because greater benefits could emerge through integration: integrating nutrition into resilience thinking and resilience thinking informing nutrition programming (Gostelow et al, 2015).

Box 5 Summary of the Community Resilience to Acute Malnutrition programme (CRAM)[23]

The Community Resilience to Acute Malnutrition programme, implemented over the course of 2013-2015, was designed to reduce the rates of acute malnutrition through an integrated programme of WASH, health and nutrition, and food, income and markets.

Key findings of an **impact evaluation of CRAM** indicated that:

- It protected against an increase in both acute (wasting) and chronic (stunting) undernutrition.
- It increased the rate of exclusive breastfeeding in children under the age of six months.
- It increased access and utilisation of boreholes and latrines, and knowledge (but not practice) around hand-washing.
- The impact of CRAM on food insecurity at the end line was ambiguous.

[23] The CRAM programme was funded by Irish Aid, the European Union and partially funded by the Department for International Development. The impact evaluation was conducted by the Feinstein International Center at Tufts University.

WFP/Shehzad Noorani, Bangladesh, 2017.

An example of resilience nutrition programming is Concern Worldwide's Community Resilience to Acute Malnutrition programme in Chad (see box 5 for details). While the main objective was to limit increases in acute malnutrition, the results also showed effects on preventing increases in stunting (at end line the prevalence of stunting among intervention group was significantly lower than in the control group, at 30 per cent versus 37 per cent, respectively) and provide evidence of the benefits of multi-sector efforts looking at underlying causes and pathways of undernutrition. The challenge now is to build on the gains made during this programme and, crucially, how to take these kinds of effort to scale.

Findings from emerging studies such as REFANI[24] may contribute knowledge to nutrition resilience; e.g. results from seasonal interventions to prevent stunting through cash transfers have shown at least a short to medium-term effect on preventing increases in stunting rates. Taking these successful research programmes to scale may present particular challenges in many FCAS, where state institutions for multi-sector coordination can be weak. (Although it is important to note that the opposite may also be true: there may be more flexibility for multi-sector programming during crisis situations, where weakened governance provides more opportunities for external actors to implement less vertical programming). A large-scale, nutrition-sensitive social protection approach, the Ethiopian Productive Safety Net Programme (PSNP) has shown mixed results to date; one study described an encouraging 'cushioning' effect for nutritional vulnerabilities in children demonstrating conditional cash transfers having a positive nutritional impact (statistically significant increases in HAZ) on young children of participant households in a context outside Latin America (where most evidence originates from) (Porter and Goyal, 2016). Another study showed no evidence that the PSNP impacts either stunting (HAZ) or wasting (WHZ) in young children (under five years old), and while the authors could not definitively identify the reason for this non-result, it was noted that child diet quality was poor during the time period under study (2008-12) and there was no evidence that the PSNP improved child consumption of pulses, oils, fruits, vegetables, dairy products, or animal-source proteins (Berhane et al, 2017).

Key points

- Interventions aimed at limiting increases in stunting, including seasonal approaches, may be important components of resilience strategies; however their implementation at scale is needed.
- Cash programming may provide opportunities to strengthen nutrition resilience.

[24] The REFANI project aimed to strengthen the evidence base on the nutritional impact and cost-effectiveness of cash and voucher-based food assistance programmes, as well as identify the mechanisms through which this effectiveness is achieved.

12 The funding environment

The funding environment for humanitarian situations has historically been provision of short-term grants, most often to external actors, which is well suited to acute crises which rapidly resolve. As previously described, protracted crises have become much more common, with complicated political and/or operational environments, often involving conflicts, which linger on for years or even decades. They are spaces where development actions and funding are required, but instead they consume the majority of humanitarian funding (OECD, 2015).

The Global Humanitarian Report for 2016 highlighted that long-term crises continued to absorb the largest volumes of international humanitarian assistance; i.e. they are recipients of repeated cycles of humanitarian funds. In 2014, 91 per cent of official humanitarian assistance from OECD Development Assistance Committee (DAC) donors went to long and medium-term recipients. This reinforces the rationale for more multi-annual humanitarian planning and financing (GHA, 2016).

In an important development, the 'Grand Bargain' was launched at the World Humanitarian Summit in 2016. It encompasses a package of reforms to humanitarian funding and has particular relevance for efforts at stunting reduction through the commitments to increase collaborative humanitarian multi-year funding, increase the use and coordination of cash-based programming, and enhance engagement between humanitarian and development actors (ENN, 2016b).

Humanitarian grants need to consider the three stages of preparedness, response and transition. Financing arrangements can hinder the progression from stages one to three if stop/start mechanisms are used. Through the resilience agenda, some of the DAC donors have made strides in developing more coherent mechanisms to allocate funding in protracted contexts on a multi-year basis, channelling funding directly to NGOs, the UN and other multilateral agencies, and to country-level humanitarian response or emergency relief funds. This kind of funding is much more suitable for the longer-term approaches required for stunting prevention. Multi-year funding is useful because it increases predictability, provides partners with greater flexibility, incurs lower operational costs and allows donors and their partners to develop more strategic partnerships (Walton, 2011).

There may well be other opportunities for humanitarian funding to impact on 'longer-term' conditions such as stunting; for example, funding through local NGOs, funding through governments instead of (or as well as) external actors, designing humanitarian funding so that it can leave more of a 'legacy' in terms of nutrition capacity and coordination structures (to improve resilience) or channelling humanitarian funds in a way that can ensure some residual funding remains in place for smaller-scale programming.

The current estimated burden of stunting in FCAS is likely to increase proportionately as gains are made in reducing stunting in more stable contexts. As Webb et al (2014) describe, global targets for stunting reduction also require attention to the institutional, human and budgetary capacities needed for scaling up evidence-based, nutrition-specific actions in countries that are still humanitarian hotspots. If the ambitious WHA targets for stunting are to be reached by 2025 (or indeed the SDG targets by 2030), programming in FCAS will need to look at what is possible for stunting prevention, including essential multi-sector actions to address the multiple underlying determinants. This kind of programming will require multiannual or other longer-term funding mechanisms to implement.

Key points

- Long-term crises continue to absorb the largest volumes of humanitarian assistance.
- The 'Grand Bargain' offers scope to support stunting reduction, especially through the commitments to bridge traditional humanitarian and development divides.
- Multiannual or other long-term funding mechanisms are required for effective multi-sector programming in protracted crises.
- Is it feasible to consider that humanitarian funding can be 'stretched' to address stunting and, if so, what would the priority interventions be? What would it take to convince donors – through analysis of the cost of not intervening?

13 Conclusions and next steps

The investigation aimed to build on 'joined-up' thinking, addressing some of the gaps in knowledge on stunting in humanitarian and protracted contexts, and asking whether a new objective is called for; namely that **a reduction in stunting (or at least no increase) should be viewed as a legitimate humanitarian goal in the same way that prevention and treatment of wasting is being seen as a legitimate development goal.**

This paper outlines the many difficulties of gaining a clear understanding of the needs and then mounting an effective nutrition response to tackle stunting in FCAS, which include:

- High (and in some cases, increasing) burden of stunting.
- Lack of routine reporting for severe stunting prevalence.
- Lack of clear assessment or monitoring data on stunting and difficulties in accessing vulnerable populations.
- Lack of evidence for the types of stunting prevention strategies that can be implemented across multi-sector programmes with short-term funding and in FCAS contexts.
- Lack of attention to maternal nutrition needs, despite the fact that the critical importance of the antenatal period to stunting in infants is well understood.
- Lack of evidence for the effectiveness of multi-sector interventions, particularly in humanitarian contexts, including how to 'stretch' the limited humanitarian funding to include interventions that reduce stunting along with those that prevent and treat wasting.
- Limited understanding of how to protect the 'development' gains in stunting reduction made pre-crisis in the context of intermittent or recurrent crises eroding the resilience of affected populations.

Although this investigation has raised more questions than can currently be answered, a number of ways forward are outlined below to be discussed during a series of discussions with individual experts and via an ENN webinar planned for early 2018. This will be followed by an ENN-hosted roundtable discussion, also in early 2018.

Nutrition principles and enabling architecture

Given the high burden of stunting in FCAS and the risk of deterioration in these contexts, it is clear that to meet SDG targets stunting prevention needs to be embedded in humanitarian response principles and standards and articulated clearly in global and regional nutrition agendas as well as FCAS country nutrition plans. In order to achieve this, it will be necessary to engage with multiple stakeholders at various levels. National governments of FCAS may need support to articulate how stunting reduction strategies and multi-sector plans involving emergency preparedness, risk reduction and resilience programming can help ensure stunting levels do not rise in a crisis. It will also be important to determine which pre-crisis interventions should be prioritised for protection during crisis situations, which are inherently more resilient during shocks, and which could continue effectively with some adaptation. A key objective must be to protect gains made pre-crisis.
A first step will be to convene a webinar involving a select group of actors able to identify key leverage points in the international architecture where evidence and advocacy should be directed. This will enable us to begin the process of embedding stunting prevention principles, policies, strategies and plans in crisis contexts. At global and regional level critical frameworks and initiatives include the SUN Movement, New Ways of Working and Zero Hunger, while at country level disaster preparedness, early response and resilience building as part of national nutrition plans will need to incorporate stunting prevention aims and related changes to monitoring and evaluation (M&E) systems.

Assessment, analysis, monitoring and response frameworks

Deeper analysis of existing datasets (DHS, MICS, UNHCR and country-level surveys) should be undertaken to provide clearer geographic and seasonal enunciation of the burden of stunting in FCAS and in

crisis contexts. Some existing datasets may be useful to explore linkages between types and coverage of interventions and changes in stunting levels (e.g. UNHCR database for refugees). Furthermore, and recognising the complex set of underlying determinants of stunting, more comprehensive and systematic causal analysis is required during protracted crises on the potential drivers of stunting in the affected areas.

We also suggest that severe stunting prevalence and burden should be routinely highlighted alongside overall stunting in annual reports which are used to track country and global progress, e.g. routine population-based surveys (DHS, MICS), smaller-scale cross- sectional surveys (e.g. SMART) and the Joint Malnutrition Estimates (JMEs) and the Global Nutrition Reports (GNRs).

Ultimately, we need to be working towards a practical response framework which informs decisions about which interventions to prioritise in order to have maximum impact on stunting prevention in protracted humanitarian crises. A starting point may be the framework used by UNHCR for refugee contexts. However, the variables to consider in any response decision tree outside of refugee contexts will vary enormously and will be highly context-specific, e.g. capacity of health and nutrition-related sectors and systems, types of crisis, major public health problems, etc. The feasibility of developing a credible response framework begs the question how evidenced such a framework need be and whether we currently have a sufficiently strong global evidence base to inform such a framework. Interventions that have shown to be most resilient to shocks (e.g. development gains that can be protected during subsequent crises) must be prioritised for inclusion in a response framework.

Interventions to reduce stunting

There is a growing body of work looking at the impact of nutrition-specific and nutrition-sensitive interventions (including multi-sector programming) on stunting. Much of this work is taking place in FCAS, although an unknown but substantial proportion of this work resides in project-specific studies, reviews and evaluations rather than peer-reviewed publications. Critical areas where the evidence base needs to be strengthened in FCAS for impact on stunting include interventions that tackle adolescent and maternal nutrition (considering the estimated 20 per cent of stunting occurring in utero), nutrition-sensitive agriculture, WASH and cash-based programming. Ongoing work in these areas needs to be mapped with a view to a systematic review. A review that separates out FCAS contexts would help inform a response framework for stunting prevention in humanitarian contexts and by definition provide context-relevant findings. The non-FCAS context findings could also help understanding of what elements need to be in place in order to have maximum impact on stunting prevention in any context. Furthermore, if the review considered both stunting and wasting prevention together it could help inform more integrated response frameworks.

Funding and advocacy

In order to progress a stunting prevention agenda in FCAS, a number of advocacy messages and approaches may be considered. This messaging can easily be built on the SUN 2 Road Map, Grand Bargain/New Ways of Working and can be predicated on a clear statement that it will be impossible to meet global SDGs and WHA targets without greater focus on stunting in FCAS.

This message can be further reinforced by an FCAS specific analysis of the cost of not intervening for stunting and the relative returns on investing in prevention. The risks of mortality associated with stunting (especially severe stunting and concurrent wasting and stunting) as well as the role of wasting as a risk factor for stunting must also be emphasised. The latter in particular speaks to the need for a greater consideration of joint nutrition objectives and outcomes (reducing the prevalence of both stunting and wasting) in FCAS and their periodic crises.

This ‘stunting-in-protracted crises’ agenda has many implications for international and national development partners and government. They include a realignment of financing mechanisms in FCAS during crises that provides greater support to programming that contributes to stunting prevention, e.g. multi-year funding, greater financing through government and local NGOs, and financing for system strengthening and surge capacity (health, social protection, risk minimisation programmes). In addition, nutrition actors need to consider shared analysis of needs and prioritisation of response across both humanitarian and development realms (the ‘nexus’). This may require an articulation of shared outcomes, geographical convergence and multisectoral actions to jointly address wasting and stunting. Finally, there needs to be greater accountability for stunting-reduction goals in crises and therefore advocacy for adherence to monitoring frameworks that include stunting prevalence, especially in protracted crisis situations, allowing results to be tracked over the long-term as well as in periods of more acute crises.

Annex 1 List of key informants

No.	Name	Organisation
1	Abi Perry	DFID
2	Erin Boyd	OFDA/USAID
3	Marie Sophie Witney	ECHO/EU
4	Gaelle Nizery	ECHO/EU
5	Ellen Piwoz	Bill and Melinda Gates Foundation
6	Parul Christian	Bill and Melinda Gates Foundation
7	Britta Schumacher	World Food Programme
8	Caroline Wilkinson	UNHCR
9	Melody Tondeur	UNHCR
10	Zita Weise Prinzo	World Health Organsation
11	Josephine Ippe	Global Nutrition Cluster
12	Patrizia Fracassi	SUN Movement Secretariat
13	Purnima Kashyap	SUN Movement Secretariat/WFP
14	Alam Khattak	SUN Movement Secretariat
15	Marko Kerac	London School of Hygiene and Tropical Medicine
16	Patrick Webb	Tufts University
17	Andre Briend	Independent
18	Andrew Hall	National Information Platforms for Nutrition
19	Andy Prendergast	Zvitambo Institute for Maternal and Child Health Research
20	Sheila Isanaka	Epicentre
21	Liesel Talley	Centre for Disease Control
22	Zulfiqar Bhutta	Hospital for Sick Children, Toronto
23	Andy Seal	University College London
24	Peter Hailey	Independent
25	Kate Golden	Concern Worldwide
26	Nikki Connell	Save the Children
27	Colleen Emary	World Vision
28	Sinead O Mahony	GOAL
29	Saskia Van Der Kam	MSF-Holland
30	Casie Tesfai	International Rescue Committee
31	Mark Manary	Washington University, St Louis
32	Zivai Murira	UNICEF

Annex 2 Key informant questions

To discuss in general what is being planned/discussed with the individual or agency – including in the areas below:

- What we know already, what is missing, what are the priorities for tackling stunting in crisis situations (either prevention or treatment of stunting).
- The extent to which levels of stunting are assessed or considered in planning and in the monitoring of the response over time; and for which target groups.
- What is being done in terms of programming to reduce and prevent stunting?
- What is the current institutional architecture and funding environment for supporting stunting treatment and prevention?
- What are the key obstacles to preventing or treating stunting in emergencies – is it evidence, finance, technical capacity, other?

A. Current evidence base, knowledge, gaps priorities

1. Is there any recent research (past three years since Lancet 2013) you know of that you can direct me to? For either impact on or prevention of stunting (and in emergency contexts)?
2. Is there evidence for nutrition-specific and nutrition-sensitive interventions implemented in stable contexts that is appropriate for the emergency context? If so, which interventions and in what ways?
3. Do existing humanitarian response interventions take account of the needs of stunted individuals and protect linear growth?
4. What other interventions have potential to impact stunting levels in an emergency (e.g. micronutrient supplementation, WASH interventions, food supplementation, etc)?
5. How does/should stunting prevention programming differ from wasting prevention in emergencies? What can we learn from treating and preventing wasting that could apply to stunting?
6. In your opinion, what are the priority research gaps?

B. Assessment, monitoring, trends in FCAS contexts, opportunities, gaps

1. Does your organisation undertake any assessments of stunting in FCAS contexts? Or any monitoring or trend analysis?
2. To what extent are levels of stunting (including severe stunting) monitored pre, during and post-crisis? By whom?
3. Are there any frameworks linking levels found to response analysis and planning of interventions?
4. What monitoring/surveys would be appropriate for this (i.e. which current data – SMART, Rapid Assessment, other)?
5. What population-level data on trends exists in FCAS contexts; how much of the burden of stunting in FCAS do these cover and how reliable is this data?
6. Is there any trend or monitoring data from interventions addressing pregnant and lactating women or adolescents (nutrition, health or reproductive health sectors)?

C. Prevention vs treatment; current programming environment; opportunities, gaps

1. What levels of stunting are present in populations being responded to in FCAS (how widespread is the potential issue)? What are the 'triggers' for response?
2. Do you know of any treatment programmes for stunting being implemented in FCAS? What do these consist of? Are nutritional products used? If so, what?
3. Are there any interventions targeting/tackling severe stunting? If so, what?
4. Do you know of any stunting prevention programmes being implemented in FCAS? If so, by whom (humanitarian actors, government, etc.) and what do they consist of?
5. Do any nutrition-specific programmes implemented in emergency settings address the needs of stunted individuals (or those at risk of stunting)? If so, how?

6. Do nutrition-sensitive interventions implemented in emergency situations take into account the needs of stunted individuals? If so, how?
7. Is there any additional targeting of women due to the relationship between maternal nutrition and in utero stunting? If so, who (pregnant, all women, adolescents), why, how, and with what?

D. Institutional architecture and funding environment; opportunities, gaps

1. How does the institutional architecture support (or not) the consideration of stunting (both individual and population implications) in emergency response (including SUN, GNC, etc.)?
2. What normative guidance (UNHCR, WHO, WFP, etc.) exists for identifying and tackling stunting in crisis-affected populations?
3. Does your organisation secure or deliver any longer-term funding mechanisms in emergency contexts?
4. What are the cost implications of addressing drivers of stunting in crisis situations and are these prohibitive?
5. What (in your view) are effective advocacy mechanisms? What are we missing?

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Annex 3 FCAS stunting levels and burden

Fragile and conflict-affected states (DFID 2015**) and/or countries in protracted crisis (FAO 2010) with stunting levels and burden

Country FAO 2010 DFID 2015 Both	Stunting prevalence (JME 2016)*^	Stunting Burden (JME 2016)*	Severe stunting prevalence (WHO 2015)+	Concurrence (Victora 2015/DHS)	On course to meet WHA stunting target (IFPRI 2016)	SUN country	GNC Level 3 (L3) or High Priority (HP)
Afghanistan	40.9% (2013)	2,042,523	31.8% (2004)		Yes	Yes	L3
Angola	37.6% (2016)	1,818,223	15.2% (2016)		Unknown		
Bangladesh	36.1% (2014)	5,549,928	15.7% (2013)	7.6% (2011)	Yes	Yes	HP
Burkina Faso	27.3% (2016)	873,313		5.0% (2010)	No	Yes	
Burma/ Myanmar	29.2% (2016)	1,317,086	8.2% (2016)		No	Yes	HP
Burundi	57.5% (2010)	990,429		3.7% (2010)	No	Yes	
Cambodia	32.4% (2014)	571,434	14.0% (2011)	4.7% (2010)	Yes	Yes	
Cameroon	31.7% (2016)	1,142,233	14.1% (2016)	2.6% (2011)	No	Yes	
CAR	40.7% (2010)	267,094	18.3% (2010)	4.4% (1994)	No	Yes	HP
Chad	39.9% (2010)	1,050,308	21.8% (2016)	7.1% (2004)	No	Yes	HP
Comoros	32.1% (2012)	36,401	16.5% (2012)	2.4% (2012)	No	Yes	
Congo	21.2% (2015)	173,771	8.4% (2011)	1.1% (2011)	No	Yes	
Côte D'Ivoire	29.6% (2012)	1,014,163	12.0% (2012)	2.1% (2011)	No	Yes	
DPRK	27.9% (2012)	471,732	7.2% (2012)		Yes		
DRC	42.6% (2013)	5,632,957	22.6% (2013)	2.6% (2013)	No	Yes	HP
Djibouti	33.5% (2012)	33,482	19.0% (2012)		No ~		
Egypt	22.3% (2014)	2,615,176	16.1% (2008)	0.2% (2000)	Yes		
Eritrea	50.3% (2010)	392,674	25.4% (2010)		No ~		
Ethiopia	38.4% (2016)	5,689,382	18.7% (2014)	4.3% (2011)	No	Yes	HP
Guinea	31.3% (2012)	600,589	13.8% (2012)	2.4% (2012)	No		
Guinea Bissau	27.6% (2014)	78,269	10.4% (2010)		No	Yes	
Haiti	21.9% (2012)	274,437	7.8% (2012)	1.6% (2012)	No	Yes	
Iraq	22.6% (2011)	1,161,596	9.9% (2011)		No		L3
Kenya	26.0% (2014)	1,838,774	14.4% (2009)	1.9% (2008)	Yes	Yes	HP
Kiribati					Unknown		

** Personal communication
* UNICEF/WHO/WB joint estimates database – Children 0-59 months included.
^ stunting prevalence categorised according to WHO as Critical (≥40 per cent), Serious (30-39 per cent), Poor (20-29 per cent), Acceptable (<20 per cent).
+ figures in blue are from different surveys than the overall stunting prevalences quoted.
~ no progress being made on stunting.
All data and figures as of August 2017.

Continued

Country FAO 2010 DFID 2015 Both	Stunting prevalence (JME 2016)*^	Stunting Burden (JME 2016)*	Severe stunting prevalence (WHO 2015)+	Concurrence (Victora 2015/DHS)	On course to meet WHA stunting target (IFPRI 2016)	SUN country	GNC Level 3 (L3) or High Priority (HP)
Lebanon	16.5% (2004)	54,256	9.8% (2004)		Unknown		
Liberia	32.1% (2013)	220,096	12.6% (2013)	1.9% (2013)	Yes	Yes	
Libya	21.0% (2007)	131,801	10.5% (2007)		Unknown		
Madagascar	49.2% (2009)	1,631,433	26.3% (2009)	6.2% (2003)	No	Yes	
Malawi	42.4% (2014)	1,227,594	20.9% (2010)	1.4% (2010)	No	Yes	
Mali	38.5% (2006)	983,081	20.0% (2006)	4.4% (2012)	No	Yes	HP
Marshall Islands					Unknown		
Mauritania	27.9% (2015)	167,702	5.5% (2012)		No	Yes	
Nepal	37.4% (2014)	1,067,473	16.3% (2011)	4.2% (2011)	No	Yes	HP
Niger	43.0% (2012)	1,585,305	21.2% (2012)	8.2% (2012)	No	Yes	HP
Nigeria	32.9% (2015)	10,234,926	21.0% (2013)	5.6% (2013)	No	Yes	
Palestinian territories (WB&Gaza)	7.4% (2014)	50,976					
Pakistan	45.0% (2012)	10,683,321	24.5% (2012)	5.4% (2012)	No ~	Yes	HP
Rwanda	37.9% (2015)	642,359	17.2% (2011)	1.1% (2010)	No	Yes	
São Tomé & Príncipe	17.2% (2014)	5,022	14.3% (2008)	1.5% (2008)	No		
Sierra Leone	37.9% (2013)	376,459	19.1% (2013)	3.0% (2013)	Yes	Yes	
Solomon Islands	32.8% (2007)	24,850	8.5% (2007)		Unknown		
Somalia	25.9% (2009)	460,529	24.3% (2006)		No	Yes	HP
Sudan (North)	38.2% (2014)	2,244,920	19.5% (2006)		No ~	Yes	HP
Sudan (South)	31.1% (2010)		17.1% (2010)		No	Yes	L3
Sri Lanka	14.7% (2012)	256,244	4.6% (2009)		No	Yes	
Syria	27.5% (2009)	707,003	15.3% (2009)		No ~		L3
Tajikistan	26.8% (2012)	287,763	10.5% (2012)	1.7% (2012)	No	Yes	
Timor-Leste	50.2% (2013)	89,851	33.0% (2009)	7.6% (2009)	No ~		
Togo	27.5% (2014)	314,184	8.8% (2010)	4.9% (1998)	No	Yes	
Tuvalu	10.0% (2007)	100	3.3% (2007)		Unknown		
Uganda	34.2% (2012)	2,318,344	13.9% (2011)	1.3% (2011)	No	Yes	
Yemen	46.5% (2014)	1,806,590	21.8% (2011)		No	Yes	L3
Zimbabwe	27.6% (2014)	678,963	7.8% (2014)	0.9% (2010)	No	Yes	

** Personal communication
* UNICEF/WHO/WB joint estimates database – Children 0-59 months included.
^ stunting prevalence categorised according to WHO as Critical (≥40 per cent), Serious (30-39 per cent), Poor (20-29 per cent), Acceptable (<20 per cent).
+ figures in blue are from different surveys than the overall stunting prevalences quoted.
~ no progress being made on stunting.
All data and figures as of August 2017.

References

Berhane G, Hoddinott J, Kumar N. (2017) *The Impact of Ethiopia's Productive Safety Net Programmme on the Nutritional Status of Children: 2008-2012.* IFPRI Discussion Paper. www.ifpri.org/publication/impact-ethiopias-productive-safety-net-programme-nutritional-status-children-20082012-0

Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, Ezzati M, Grantham-McGregor S, Katz J, Martorell R, Uauy R and Maternal and Child Nutrition Study Group (2013), *Maternal and Child Undernutrition and Overweight in Low-income and Middle-income Countries,* The Lancet, 382 (9890): 427-451. http://dx.doi.org/10.1016/SO140-6736(13)60937-X

Burt A, Hughes B, Milante G. (2014). Eradicating poverty in fragile states: Prospects of reaching the "high-hanging" fruit by 2030. World Bank Policy Research Working Paper, (7002), 2014

Briend A, Khara T, Dolan C. *Wasting and stunting – similarities and differences: policy and programmatic implications.* Food and Nutrition Bulletin, vol. 36, no. 1 © 2015 (supplement)

Brown KH, Black RE, Becker S. (1982). *Seasonal changes in nutritional status and the prevalence of malnutrition in a longitudinal study of young children in rural Bangladesh.* American Journal of Clinical Nutrition 36: AUGUST 1982, pp. 303-313.

Carpenter S and Bennett C. (2015). *Managing crises together: towards coherence and complementarity in recurrent and protracted crises.* Overseas Development Institute, Humanitarian Policy Group.

Caulfield LE, de Onis M, Blossner M, Black RE. *Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria, and measles.* Am J Clin Nutr. 2004;80:193–8.

Danaei G, Andrews KG, Sudfeld CR, Fink G, McCoy DC, Peet E, et al. (2016) *Risk Factors for Childhood Stunting in 137 Developing Countries: A Comparative Risk Assessment Analysis at Global, Regional, and Country Levels.* PLoS Med 13(11): e1002164. doi:10.1371/journal.pmed.1002164

Dangour AD, Watson L, Cumming O, Boisson S, Che Y, Velleman Y, Cavill S, Allen E, Uauy R. (2013) *Interventions to improve water quality and supply, sanitation and hygiene practices, and their effects on the nutritional status of children.* Cochrane Database Syst Rev, 8. CD009382. ISSN 1469-493X DOI: 10.1002/14651858.CD009382.pub2

De Onis M, Branca F. *Childhood stunting: A global perspective*. Maternal & Child Nutrition (2016), 12 (Suppl. 1), pp. 12–26

ENN (2015) Khara T, Dolan C, Shoham J. *Stunting in protracted emergency contexts. What are the implications for humanitarian programming of responding to stunting in protracted emergency contexts, and what should we be doing about it?* ENN, Oxford, UK

ENN (2016a) Shoham J, Dolan C and Gatchell V. *Global Nutrition Cluster knowledge management: process, learning & added value.* Field Exchange 52, June 2016. p55. www.ennonline.net/fex/52/editorial
ENN (2016b). *Grand Bargain: Reform or business as usual?* Field Exchange 53, November 2016. p51. www.ennonline.net/fex/53/grandbargain

FAO (2010) *Countries in protracted crisis: what are they are why do they deserve special attention?*

FAO (2012) Food insecurity in protracted crises: an overview.

FAO/WHO (2015). Rome Declaration and the Framework for Action; second International Conference on Nutrition (ICN2).

Global Humanitarian Assistance Report (2016). Development Initiatives.

Gough EK, Moodie EEM, Prendergast AJ, Ntozini R, Moulton LH, Humphrey JH, Manges AR. (2016). *Linear growth trajectories in Zimbabwean infants.* American Journal of Clinical Nutrition 2016;104:1616-27.

Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B and the International Child Development Steering Group (2007). *Developmental potential in the first 5 years for children in developing countries.* Lancet; (369): 60–7

Grijalva-Eternod CS, Wells JC, Cortina-Borja M, Salse-Ubach N, Tondeur MC, Dolan C, Meziani C, Wilkinson C, Spiegel P, Seal AJ, 2012. *The double burden of obesity and malnutrition in a protracted emergency setting: a cross- sectional study of Western Sahara refugees.* PLoS Med. 9 (10), e1001320.

Gostelow L, Desplats G, Shoham J, Dolan C, Hailey P, (2016). *Nutrition and Resilience: A Scoping Study.* www.ennonline.net/nutritionandresilienceascopingstudy
Hoddinott J et al (2013). The economic rationale for investing in stunting reduction. Maternal and Child Nutrition, 9 (Suppl. 2), pp. 69-82.

Hossain M, Choudhury N, Khaleda ABA, Monda P, Jackson A, Walson J, Tahmeed A. 2017. *Evidence-based approaches to childhood stunting in low and middle income countries: A systematic review.* ADC Online First, published on May 3, 2017 as 10.1136/archdischild-2016-311050

IASC (2016) https://interagencystandingcommittee.org/content/grand-bargain-hosted-iasc (date accessed 12.12.16)

IFE core group (2017). *Operational Guidance on Infant and Young Child Feeding in Emergencies.* October 2017.

IFPRI (2015). *Global Nutrition Report 2015*: Actions and Accountability to Advance Nutrition and Sustainable Development. International Food Policy Research Institute. Washington, DC.

IFPRI (2015a). 2014–2015 *Global Food Policy Report.* Washington, DC: International Food Policy Research Institute.

IFPRI (2016). *Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030.* Retrieved from Washington, DC.

IPC (2014). Version 1.0. IPC Chronic Food Insecurity Classification. *Integrated Food Security Phase Classification Evidence and Standards for Better Food Security Decisions.* Brief June 2014

Khara T, Mwangome M, Ngari M, Dolan C. *Children concurrently wasted and stunted: A meta-analysis of prevalence data of children 6-59 months from 84 countries.* Matern Child Nutr. 2017;e12516. https://doi.org/10.1111/mcn.12516

Lassi ZS, Majeed A, Rashid A, Yakoob MY, Bhutta ZA. (2013) The *Interconnections between maternal and newborn health – evidence and implications for policy.* Journal of Maternal-Fetal & Neonatal Medicine 26. Supll 1, pp 3-53. Doi:10.3109/14767058.2013.784737.

Liu X, Behrman JR, Stein AD, Adair LS, Bhargava SK, Borja JB, et al. (2017) *Prenatal care and child growth and schooling in four low- and medium-income countries.* PLoS ONE 12(2): e0171299. doi:10.1371/journal.pone.0171299

Martorell R, Young MF. (2012). *Patterns of stunting and wasting: potential explanatory factors.* American Society for Nutrition. Adv. Nutr. 3: 227–233, 2012; doi:10.3945/an.111.001107.

McDonald CM, Olofin I, Flaxman S, Fawzi WW, Spiegelman D, Caulfield LE, Black RE, Ezzati M, and Danaei G, for the Nutrition Impact Model Study. *The effect of multiple anthropometric deficits on child mortality: meta-analysis of individual data in 10 prospective studies from developing countries.* AJCN. First published ahead of print February 20, 2013 as doi: 10.3945/ajcn.112.047639.

Nabwera HM, Fulford AJ, Moore SE, Prentice AM. (2017). *Growth faltering in rural Gambian children after four decades of interventions: a retrospective cohort study.* Lancet Glob Health 2017; 5: e208-16

Carpenter S and Bennett C. (2015). *Managing crises together: towards coherence and complementarity in recurrent and protracted crises.* Overseas Development Institute (ODI) Hunamitarian Practice Network July 2015.

Olofin I, McDonald CM, Ezzati M, Flaxman S, Black RE, Fawzi WW, Caulfield LE, Danaei G (2013). *Associations of suboptimal growth with all-cause and cause-specific mortality in children under five years: a pooled analysis of ten prospective studies.* PLoS One 8(5): e64636.

OECD (2015). *Financing in Crisis? Making humanitarian finance fit for the future*, Rachel Scott, OECD Development Co-operation Directorate.

Panlilio F. (2008). *Philippine Nutrition Cluster's battle for the best: the breast.* Field Exchange 34, October 2008. p37. www.ennonline.net/fex/34/philippine (date accessed: 11.11.16)

Porter C and Goyal R. (2016). *Social protection for all ages? Impacts of Ethiopia's Productive Safety Net Programme on child nutrition.* Social Science and Medicin 159 (2016) 92-99.

Prendergast AJ and Humphrey JH (2014). *The stunting syndrome in developing countries.* Paediatrics and International Child Health. Vol. 34 No. 4

Richard SA, Black RE, Checkley W (2012). *Revisiting the Relationship of Weight and Height in Early Childhood.* Advances in Nutrition 2012 pp 250-254.

Shoham J, Dolan C, Gostelow L. ENN (2013). *The Management of Acute Malnutrition at Scale: A Review of Donor and Government Financing Arrangements*. Summary Report. March 2013.

Smith L and Haddad L. (2015). *Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era.* World Development Vol. 68, pp. 180–204, 2015

Sphere Project Handbook (2011): *Humanitarian Charter and Minimum Standards in Humanitarian Response.*

Statistics Sierra Leone (SSL) and ICF International. 2014. *Sierra Leone Demographic and Health Survey 2013*. Freetown, Sierra Leone and Rockville, Maryland, USA: SSL and ICF International.

Style S, Tondeur M, Wilkinson C, Oman A, Spiegel P, Kassim IA, Grijalva-Eternod C, Dolan C, Seal A. (2013). *Operational Guidance on the use of special nutritional products in refugee populations*. Food and nutrition bulletin · December 2013. DOI: 10.1177/156482651303400407 · Source: PubMed.

Style S, Tondeur M, Grijalva-Eternod C, Pringle J, Wilkinson C, Kassim I, Oman A, Dolan C, Seal A. (2015). *Assessment of the Effectiveness of Nutributter® Distribution on Anaemia and Stunting in Refugee Populations in Djibouti and Kenya. European Journal of Nutrition & Food Safety* 5(5): 993-994, 2015, Article no.EJNFS.2015.394 ISSN: 2347-5641.

SUN Movement (2016); Strategy and Road Map 2016-2020.

Taylor S. (2013). *Fragile but not helpless: Scaling up Nutrition in Fragile and Conflict Affected States.* World Vision UK –Research Report UK-RR-CH-02

Tondeur M, Salse UN, Wilkinson C, Spiegel P, Seal AJ. (2016). *Rapid acceptability and adherence testing of a lipid-based nutrient supplement and a micronutrient powder among refugee children and pregnant and lactating women in Algeria.* Public Health Nutrition. March 2016 DOI: 10.1017/S136898001600029X

UNHCR (2011). *Operational Guidance on the Use of Special Nutritional Products to Reduce Micronutrient Deficiencies and Malnutrition in Refugee Populations.* Geneva

UNICEF/WHO/WB (2017). *Levels and trends in child malnutrition.* The 2017 Joint estimates dataset.

Victora CG, Adair L, Fall C, Hallal PC, Martorell R, Richter L et al. *Maternal and child undernutrition: consequences for adult health and human capital*. Lancet. 2008;371:340-57.

Walker SP, Chang SM, Powell CA, Simonoff E, Grantham-McGregor SM. *Early childhood stunting is associated with poor psychological functioning in late adolescence and effects are reduced by psychosocial stimulation.* J Nutr. 2007;137:2464–9.

Walton O. (2011). *Multi-Year Funding to Humanitarian Organisations in Protracted Crises.* Helpdesk Research Report: Governance and Social Development Resource Centre.

Webb P, West Jr KP, O'Hara C. (2015). The Lancet. Volume 386, No. 9992, p430-431, 1 August 2015. *Stunting in earthquake-affected districts in Nepal.* DOI: http://dx.doi.org/10.1016/S0140-6736(15)61444-1 (date accessed 08.12.16)

Webb P, Boyd E, de Pee S, Lenters L, Bloem M, Schultnik W. (2014). *Nutrition in emergencies: Do we know what works?* Food Policy 2014, vol. 49, issue P1, 33-40.

WHO (2004). *Guiding Principles for Feeding Infants and Young Children During Emergencies.* World Health Organization, 2004. English. http://whqlibdoc.who.int/hq/2004/9241546069.pdf

WHO (2012). Sixty-fifth World Health Assembly. Nutrition: *Nutrition of women in the preconception period, during pregnancy and the breastfeeding period.* Report by the Secretariat.

WFP (2014). *Programming for Nutrition-Specific Interventions.*

WHO (2015). *WHA Global Nutrition Targets 2025: Stunting Policy Brief*

WHO (2015a). *WHA Global Nutrition Targets 2025: Low Birth Weight Policy Brief*

WHO (2015b). *WHA Global Nutrition Targets 2025: Anaemia Policy Brief*

World Bank (2006). *Repositioning nutrition as central to development: a strategy for large-scale action. Washington DC:* (http://siteresources.worldbank.org/NUTRITION/Resources/281846-1131636806329/ NutritionStrategy.pdf - date accessed 31 October 2016)

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