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Nutrition in emergencies: Do we know what works?

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ABSTRACT

Nutrition actions in emergencies continue to be critical to mortality reduction and to achieving broader humanitarian as well as livelihood goals in institutionally fragile environments. In the past decade, numerous innovations have enhanced the prevention and treatment of many forms of malnutrition; these include wider adoption of new food products, protocols for their use, and programming guidelines. The quality and scale of interventions has improved despite many challenges, resulting in fewer avoidable deaths and growing success in the management of severe and moderate wasting, as well as micronutrient deficiencies. Indeed, many lessons learned in emergencies have the potential to inform non-emergency programming. As such, there is a need for more explicit attention to emergency needs and activities in global target-setting developmental agendas. However, as caseloads and costs continue to grow, there are calls for more evidence-based guidance on the best combination of approaches to use in different contexts. Best practice is still constrained by evidence gaps, due in large part to the difficulties of research in humanitarian contexts. Nevertheless, sound empirical research must be prioritized on the efficacy, effectiveness and costs of various single and combined approaches.

Introduction

In the decade since Young et al. (2004) reviewed the state of knowledge on nutrition in emergencies, there has been a sizable increase in the body of research on the multiple forms of malnutrition present in the context of crises; namely, wasting, micronutrient deficiencies, severe stunting, and now also obesity. None of these conditions is unique to emergency settings. However, the context in which government and non-governmental organizations seek to address them, characterized by the scale and urgency of required actions and the kinds of impediments often present, is different from the conventional sphere of development interventions.

The field of humanitarian response has evolved rapidly since 2000, leading to calls for greater focus on the generation of rigorous data on effectiveness, including standardization of metrics and reporting requirements (Federation of Red Cross, 2011; Navarro-Colorado et al., 2012; Taylor et al., 2012; European Commission, 2012; Kayabu et al., 2012). The evidence base for action has grown through a steady accumulation of findings on the efficacy and effectiveness of food products used in emergency programming, protocols governing their choice and use, and the role of associated (non-food) interventions required to sustain and amplify the effects of nutrition-specific actions (Webb et al., 2011). Such evidence has fueled a growing consensus on best practices, which in turn has led to a proliferation of guidance materials from international organizations operating in the humanitarian sector (United Nations High Commission for Refugees, 2011; WHO, 2012; WFP, 2012; IASC, 2012; CARE, 2012).

In this paper, we review empirical evidence that currently underpins consensus positions on 'what works' in terms of nutrition actions in emergency settings. We aim to highlight important knowledge gaps, while sharing valuable lessons to a broader non-nutritionist audience, and to nutritionists who work mainly in non-emergency settings. The scale of donor funding for nutrition actions in humanitarian contexts now dwarfs that of non-emergency programming, suggesting a need for greater engagement of, and learning among, professionals who work in these two related but still largely siloed fields of practice. The focus of the paper is on nutrition-specific interventions rather than on complementary, but indirect actions, such as voucher schemes, livelihood support, or other food security activities that were included in the review of "nutrition-related" emergency interventions by Hall et al. (2011), or, the "nutrition-sensitive" actions

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considered by Ruel and Alderman (2013). No distinction is made here among the many characterizations of emergencies, such as natural disaster, famines or complex emergency, or their underlying causes.[1]

The scale of emergency nutrition activities

In 2012, nutrition-specific actions (listed as free-standing proposals for defined nutrition activities with their own budget lines) represented 11% (US$437 million) of the total funding requirements (US$7.7 billion) under the United Nations' Consolidated Appeals Process (UN/OCHA, 2012). That does not include amounts dedicated to food aid in general (including micronutrient fortified cereal flours or emergency high-energy biscuits), nor to agriculture sector reconstruction (28% of the total), or to planned actions in the domain of water, sanitation and hygiene (a further 6%). For example, the number of children under two years of age targeted to receive nutritionally enhanced food products in the context of WFP emergency operations rose from roughly 55,000 in 2008 to over 4 million in 2012 (WFP, 2013).[2] In addition, around 2.6 million children under 5 years of age were reached with 32,000 metric tons of specialized food products by UNICEF in 2012, in emergency and non-emergency settings (UNICEF, 2013). If all forms of nutrient delivery, and complementary actions to address undernutrition, were combined, the total allocated toward nutrition actions in emergencies in 2012 can be estimated as more than half a billion US dollars. This significant focus on nutrition in emergencies contrasts with 1992 (the first year of consolidated multi-agency appeals), when there was no specific mention of nutrition at all among the 27 appeals that generated US$257 million in emergency response resources (Webb, 2009).

Several food and nutrition-related benchmarks are used to define the nutritional concerns in emergency context, as detailed below. However, as Hall et al. (2011) point out, the threshold between emergency and non-emergency situations is not always well defined, in large part because the physiological conditions that carry life-threatening risks (wasting, serious micronutrient deficiencies, and even extreme stunting) can manifest in many contexts. Bhutta et al. (2013) state that "the nutritional status of individuals assessed and treated in emergency contexts overlaps substantially with non-emergency settings." In other words, emergencies often act as a tipping point, laying bare pre-existing nutrition concerns.

An impending, or already established, emergency may be defined on the basis of food security indicators (e.g. staple prices, harvest sizes, household food consumption patterns), nutrition indicators, such as the prevalence of global acute malnutrition (GAM) and severe acute malnutrition (SAM), or a combination of both.[3] Various food security and livelihood indicators provide early warning of deterioration, while increases in SAM and GAM prevalence are typically seen once an emergency is underway – sometimes rising from levels that already exceeded "emergency" thresholds prior to the onset of formally-defined crisis.[4]

Currently, prevalence estimates are typically computed for children 6–59 months old based on the 2006 WHO Child Growth Standards and weight-for-height indices, but the use of Mid-Upper Arm Circumference (MUAC) as a way of measuring nutritional status that is particularly sensitive to mortality risks is increasingly advocated by non-governmental organizations, academics and the World Health Organization.[5] For SAM and GAM specifically, various alert and emergency thresholds have been proposed. The WHO considers SAM and GAM prevalence of $\geqslant$5% and $\geqslant$15% respectively as indicative of a "critical" situation, while the World Food Programme uses the $\geqslant$15% threshold as a trigger for blanket food supplementation of vulnerable populations (IASC, 2012; World Health Organization, 2002; Action Against Hunger, 2010). In general, however, a context-specific classification of gravity that also considers underlying trends and concomitant disease risk factors is recommended, in line with the promotion of the Integrated Phase Classification (Integrated Food Security Phase Classification (IPC)). In several regions of the world (e.g. South Asia), alarming levels of acute malnutrition (wasting) prevalence are noted on a yearly basis. These chronic situations mostly require long-term, developmental solutions, and often do not fall within the scope of an emergency response.

As noted by Dale (2012), "the main objective of emergency nutrition interventions... is to prevent mortality." That objective is echoed by other bodies, including the European Commission, which states that the objective of its humanitarian policy is "to reduce or avoid excess mortality and morbidity due to undernutrition in humanitarian situations." (European Commission, 2012)[6] Since mortality during crises is often mediated by a serious deterioration in nutritional status, it has long been accepted that "nutritional rehabilitation and maintenance of adequate nutritional levels can be one of the most effective interventions...to decrease mortality." (Noji and Burkholder, 1999) As a result, the goals of nutrition action in emergencies typically include:

(a) Reducing levels of wasting (GAM and SAM with or without oedema[7]) to below conventionally-defined emergency rates or thresholds,
(b) reducing and/or preventing micronutrient deficiencies, because these markedly increase mortality risks (note also that stunted children are very likely to be deficient in one or more key micronutrients),
(c) reducing the specific vulnerability of infants and young children in crises through the promotion of appropriate child care, with special emphasis on infant and young child feeding practices; and

[1] An emergency is defined by United Nations operational agencies as "a situation that threatens the lives and well-being of large numbers of a population, extraordinary action being required to ensure the survival, care and protection of those affected." (United Nations High Commission for Refugees, 2011). Such emergencies can be characterized by their sudden onset, such as earthquakes (Haiti in 2010), wind storms (The Philippines in 2013) or the flaring up of armed conflict in the context of contested power (as in South Sudan in 2014); or by their chronic nature, including Syria's cities under siege (2013/14), failing or failed states (such as Somalia) and perpetual institutional fragility (including the Democratic People's Republic of Korea).

[2] WFP alone procured 267,000 metric tons of specialized nutritious foods (including fortified blended foods, such as Super Cereal and Super Cereal Plus, lipid-based ready-to-use foods and high-energy biscuits) in 2012, most of which were delivered in the context of emergency interventions (UNICEF, 2013).

[3] The World Health Organization describes moderate wasting or GAM (children being too thin for their stature) as a weight-for-height ratio of less than −2 Standard Deviations (SDs) relative to a global reference population, while SAM (severe wasting) is defined as a ratio of below −3 SDs Z-scores (see http://www.who.int/nutrition/topics/malnutrition/en/, accessed February 2, 2014). These cut-offs are significant because children with a weight-for-height below −3 SDs have a 9 times higher risk of death than normal children (see http://apps.who.int/iris/bitstream/10665/44129/1/9789241598163_eng.pdf accessed February 2, 2014).

[4] Countries such as Timor Leste, Nepal or Sudan have frequently recorded prevalence rates of GAM above the $\geqslant$15% threshold in non-emergency years, raising questions about the definitions used; that is, why are emergencies defined by nutritional data not always formally declared as such?

[5] MUAC is the circumference of the (usually left) upper arm, measured at the midpoint between the tip of the shoulder and the tip of the elbow. Mainly used for children aged 6–59 months, MUAC can also be used to assess acute energy deficiency in adults. The measurement is taken using a plastic or paper strip which indicates circumference in millimeters and uses a 3 or 4 color code to identify the nutritional status of an individual.

[6] International targets for effective emergency response focus on ensuring that the Crude Mortality Rate no exceed 1/10,000 people/day and that fewer than 10% of children under five suffer from moderate and severe wasting (UN/OCHA, 2012; Dale, 2012).

[7] Oedema, which is an accumulation of an excessive amount of watery fluid in cells or tissues, can also represent an independent sign of severe wasting (SAM), requiring urgent medical action (Navarro-Colorado et al., 2012; IASC, 2012).