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RECOVERY, RELAPSE AND EPISODES OF DEFAULT IN THE MANAGEMENT OF ACUTE MALNUTRITION IN CHILDREN IN HUMANITARIAN EMERGENCIES

About this evidence brief

This evidence brief provides an overview of *Recovery, relapse and episodes of default in the management of acute malnutrition in children in humanitarian emergencies* – a systematic review published in March 2017 by the Humanitarian Evidence Programme and carried out by a team from the University of Sheffield. It summarizes key findings in response to the two main research questions identified, indicates the country contexts from which evidence is drawn, outlines the methodology, highlights research gaps and provides references to the original literature.

The brief aims to assist policymakers, practitioners and researchers in assessing the available evidence in this field. It does not provide advice on which interventions or approaches are more or less appropriate in any given context. The varied and varying nature of crisis, vulnerability, goals of humanitarian programming, local conditions and quality of available data make the evidence highly contextual. *The views and opinions expressed herein are those of the authors and do not necessarily represent those of Oxfam, Feinstein or the UK government.*

Objectives of the systematic review

The review represents the first ever attempt to apply systematic review methodology to establish the relationships between recovery and relapse, and between default rates and repeated episodes of default or relapse, in the management of acute malnutrition in children in humanitarian emergencies in low- and middle-income countries.

About the systematic review

The protocol, full systematic review and executive summary on which this evidence brief is based are available from [Feinstein International Center](#), [Oxfam Policy & Practice](#) and [UK government](#) websites. Citation:

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About the Humanitarian Evidence Programme

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Figure 1: Relapse rates and relationship between relapse and default. Source: The research team

Study	Country	Type	Quality†	Findings
Bahwere et al. (2014)	Malawi	Randomized controlled clinical effectiveness trial	High	Briefly mentions relapse but does not report rate.
Ciliberto et al. (2005)	Malawi	Clinical effectiveness trial	Medium	Higher default rate (9.8 percent) and lower relapse/mortality rate (8.7 percent) reported for children receiving home-based care vs. those receiving standard therapy (8.1 percent and 16.7 percent respectively).
Linneman et al. (2007)	Malawi	Observational cohort study	High	Average default rates of 7 percent for children with severe acute malnutrition (SAM) and 8 percent for children with moderate acute malnutrition (MAM) reported. Relapse rates not reported separately from non-recovery rates (3 percent and 4 percent for children with SAM and MAM respectively).
Querubin (2006)	Sudan	Programme evaluation report	Low	Default rate of 7 percent and no cases of relapse reported for children in home treatment group.
Taylor (2002)	Sudan	Programme evaluation report	Low	Average default rate of 10.1 percent reported. Readmission rate approximately 1 percent of total admissions.
UNICEF (2012)	Kenya	Programme evaluation report	Low	Default rate of 12.9 percent and relapse rate of 3.2 percent reported for outpatient SAM treatment. Default rate of 1.4 percent and relapse rate of 6.1 percent reported for inpatient SAM treatment. Default rate of 14.4 percent and relapse rate of 3.7 percent reported for MAM treatment.

† Quality evaluation was based on Critical Appraisal Skills (CASP) checklists (CASP, 2013).

Figure 2: Reasons for default reported in studies. Source: The research team

Study	Country	Type	Quality	Family illness	Other household priorities	Travel distance	Poor community sensitization	Poor follow-up	Other issues	No reason for default offered or not applicable
Amthor et al. (2009)	Malawi	Observational cohort study	High							X
Bahwere et al. (2014)	Malawi	Randomized controlled trial	High							X
Belachew and Nekatibeb (2007)	Ethiopia	Mixed methods study	Medium			X	X		X	
Chaiken et al. (2006)	Ethiopia	Observational cohort study	Low							X
Ciliberto et al. (2005)	Malawi	Randomized controlled trial	Medium							X
Collins and Sadler (2002)	Ethiopia	Observational cohort study	Medium							X
Deconinck (2004)	Ethiopia	Programme evaluation report	Low							X
Flax et al. (2009)	Malawi	Mixed methods study	Medium	X						
Gaboulaud et al. (2007)	Niger	Observational cohort study	Low							X
Grellety et al. (2012)	Niger	Observational cohort study	High							X
Huybregts et al. (2012)	Chad	Randomized controlled trial	Medium							X
Isanaka et al. (2009)	Niger	Randomized controlled trial	Medium							X
Karakochuk et al. (2012)	Ethiopia	Randomized controlled trial	High							X
Lagrone et al. (2010)	Malawi	Observational cohort study	Medium		X					

Linneman et al. (2007)	Malawi	Observational cohort study	High	X*						
Lurqin (2003)	Afghanistan	Programme evaluation report	Low	X	X				X	
Matilsky et al. (2009)	Malawi	Randomized controlled trial	High							X
Maust et al. (2015)	Sierra Leone	Randomized controlled trial	Medium							X
Morgan et al. (2015)	Angola	Programme evaluation report	Low							X
Oakley et al. (2010)	Malawi	Randomized controlled trial	High							X**
Querubin (2006)	Sudan	Programme evaluation report	Low							X
Taylor (2002)	Sudan	Programme evaluation report	Low		X					
UNICEF (2012)	Kenya	Programme evaluation report	Low					X		
Walker (2004)	Sudan	Programme evaluation report	Low			X				

* Authors indicated that high default rates at two study locations could be attributable to undiagnosed HIV infection.

** Authors did not find sufficient evidence to determine the contribution to default rates of taste/colour differences between products.

Findings

What is the relationship between recovery and relapse, and between relapse and default or return default/episodes of default?

- Six of the 24 studies included in this review addressed the issue of relapse and/or reported relapse rates (Bahwere et al., 2014; Ciliberto et al., 2005; Linneman et al., 2007; Querubin, 2006; Taylor, 2002; UNICEF, 2012). Figure 1 presents the relapse and default rates reported for each of these studies.
- None of the studies addressed the relationship between relapse and default or return default. This may be partly attributable to the relatively short duration of most interventions and the fact that most of the studies did not include post-intervention follow-up.

What are the reasons for default and relapse or return defaults/episodes of default?

- Default data was reported in each of the 24 included studies, but reasons for default were not always cited (see Figure 2).
- Relapse was reported in six of the included studies – but only one study discussed possible reasons for relapse. A UNICEF programme evaluation report of an integrated management of acute malnutrition (IMAM) programme in Kenya (2012; low quality) suggests that the lack of a follow-up system to track children treated for SAM or MAM, together with a lack of encouragement to return for outpatient treatment, may have contributed to relapses, as well as the sharing of ready-to-use therapeutic food (RUTF) among siblings and other non-admitted children.

Definitions

This systematic review seeks to establish whether there is a relationship between recovery and relapse or a relationship between default rates and/or repeated episodes of default or relapse following treatment for severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) in children aged 6–59 months in humanitarian emergencies. The review also seeks to determine the reasons for default and relapse in the same population.

Definitions of SAM and MAM are based on the National Centre for Health Statistics (NCHS) child growth standard where studies are published before or during 2006, and the World Health Organization (WHO) Child Growth Standards where published after 2006.

Humanitarian emergencies are defined as major incidents that threaten human life and public health (Global Nutrition Cluster, 2014; UNICEF, 2014), including protracted conflicts, flooding, earthquakes and other natural disasters. The team used data from ReliefWeb and the Centre for Research on the Epidemiology of Disasters (CRED) to identify the existence of a 'humanitarian' context, which might include seasonal spikes in malnutrition, a declared food crisis, natural disasters or disease outbreaks that affected nutritional status.

Recovery rate means the proportion of children who are cured through treatment in acute malnutrition programmes.

Default rate means the proportion of children absent from treatment for two consecutive sessions.

Absence and/or repeated absence means the proportion of children who were absent from treatment/the number of absences recorded.

Return default rate/repeated default episodes means the proportion of children who re-enrolled into treatment after defaulting/the number of times they re-enrolled.

Relapse rate/repeated relapse episodes means the proportion of children who re-enrolled after they had recovered and been discharged.

Time to recover means length of time between admission and discharge.

Methodology

- The research team identified a total of 9,574 articles, studies and programme reports relating to acute malnutrition in its initial search of databases and websites. Initial database and website searches took place between 1 November 2015 and 31 March 2016.
- Following the removal of duplicates, screening and quality appraisal, 24 articles were eligible for review.
- Of the 24 eligible studies, 23 focused on sub-Saharan Africa: eight were conducted in Malawi, five in Ethiopia, three in Niger, three in Sudan and the remaining four in Angola, Chad, Kenya and Sierra Leone. One study focused on Afghanistan.
- Most studies and programme reports (22 of 24) reported on quantitative outcomes and two contained both quantitative and qualitative outcomes.
- The quantitative studies included eight clinical efficacy and effectiveness trials using randomized controlled designs, seven observational cohort studies and seven programme evaluation reports.

Research gaps

The review highlighted a number of research gaps.

- The review found **little evidence on the impact of programmes implemented to manage MAM and SAM** in emergencies – and few studies explored the issue of relapse.
- There is **considerable heterogeneity in the evidence base** owing to the diversity of study types, types of intervention and settings in which the programmes were delivered. The quality of the published literature, however, varies markedly:
 - generally, the grey literature reports and qualitative studies included in the review lacked crucial detail, such as details of their recruitment strategies
 - the review of articles did identify the presence of significant barriers relating to the acceptability of the intervention and implementation issues
 - the detail presented in the mixed methods studies offers a more nuanced understanding of the precise context and, indeed, suggests that some factors are generic and others, even though present, may not have the same relative importance in a different context.
- The **lack of qualitative data on acute malnutrition in humanitarian contexts** is striking, with only two mixed methods studies eligible for inclusion in this review (Belachew and Nekatibeb, 2007; Flax et al., 2009).

However, it is possible that qualitative studies related to treatment of acute malnutrition are better represented in nutritional emergencies outside humanitarian settings.

- Child-level **data, disaggregated by age and gender**, is routinely collected in the management of acute malnutrition programmes, although this was **not reported in the included studies**. This is a gap in understanding how management of acute malnutrition may result in default and/or relapse differently in boys compared with girls. Given that boys are more likely to be wasted than girls in humanitarian emergency settings (Wamani et al., 2007), there could be a different type of programming modality for boys versus girls at certain ages. Also, the lack of age breakdown is a gap in this review, since children aged 6–23 months are often the most wasted age group (UNICEF, 2013). Age category analysis can inform how programmes can adapt to age-specific diet and psychosocial needs in order to mitigate relapse and default, and improve recovery.
- **Evidence on the relationship between recovery and relapse following management of acute malnutrition in humanitarian emergencies is sparse.**
- There is a need for more evidence on default and relapse post-treatment; for in-depth analysis of contexts where default and/or relapse rates have been historically high; for observational studies on care practices for malnourished children during and after treatment; and for studies to examine the long-term effects of SAM treatment, in particular the relationship between wasting and stunting.

Further considerations

- This review provides further confirmation that RUTF used in an outpatient setting is effective at promoting recovery from SAM and reducing mortality. It could not be established whether default rates reported were lower according to the WHO 2013 protocol, which formally included the community-based treatment of acute malnutrition using RUTF, compared with other methods to treat acute malnutrition. Data relating to relapse is limited.
- Similarly, as reported in the studies, the use of ready-to-use supplementary foods (RUSFs) to treat MAM, compared with other supplementary foods such as fortified blended foods or corn/soy blends, has the potential to improve nutritional recovery in children suffering from MAM. However, the weight gain reported for children given RUSFs or corn/soy blends was small. No significant differences in mortality rates were reported for children who received RUSF compared with children in corn/soy blends groups. It could not be

concluded whether RUSF could potentially improve relapse and default rates or reduce mortality as there was insufficient robust data available to undertake this analysis.

- Little evidence was found on the long-term impact of programmes implemented to manage MAM and SAM in emergencies. Due to the nature of humanitarian emergencies, it is difficult to conduct longitudinal data collection and trace the same children once they have been discharged. The mortality rates reported in these studies ranged from 0.007 percent (Isanaka, 2009) to 18.9 percent (Gaboulaud, 2006). Low mortality and relapse rates were associated with access to skilled medical care, availability of essential drugs, greater parental awareness of the consequences of illness and the need to seek available health services early.
- While reasons for default were sometimes cited – including distance to travel to sites, family illness and other commitments, other household priorities, poor community sensitization and household follow-up – none of the studies included in the review focused on defaulted children as an objective.
- Barriers to successful completion of acute malnutrition treatment were multi-factorial and included geographic, cultural and socioeconomic obstacles to care (Guerrero et al., 2013). For successful implementation of the WHO protocols for community-based management of acute malnutrition, emergency nutrition workers need to be able to adapt protocols to each context.
- Programmatic issues and operational challenges also vary between settings and are powerful determinants of the efficacy of programmes. Additional factors for efficacious programme implementation included the degree of integration into existing health systems, the extent of service coverage, staff training and alignment of inpatient treatment with WHO guidelines. However, there were pervasive problems such as resource constraints, the lack of adequate supervision and monitoring, lack of adequate outreach to identify the most vulnerable, dependence on external technical support, weak pipelines for specialized nutritious foods and logistical constraints.

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