SYSTEMATIC REVIEW
Humanitarian Evidence Programme

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EXECUTIVE SUMMARY

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

UKaid from the British people

Tufts University | GERALD J. AND DOROTHY R. Friedman School of Nutrition Science and Policy

Feinstein International Center

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About this executive summary

This is the executive summary of an independent systematic review commissioned by the Humanitarian Evidence Programme – a partnership between Oxfam GB and Feinstein International Center at the Friedman School of Nutrition Science and Policy, Tufts University. It was funded by aid from the United Kingdom (UK) government through the Humanitarian Innovation and Evidence (HIEP) Programme at the Department for International Development. The views and opinions expressed herein are those of the authors and do not necessarily represent those of Oxfam, Feinstein International Center or the UK government.

The systematic review was led by Robert Akparibo and Andrew Lee at the University of Sheffield. The review team included Andrew Booth, Janet Harris, Helen B. Woods, Lindsay Blank, Michelle Holdsworth at the University of Sheffield, with Seth Adu-Afarwuah, Mark Manary and Tanya Khara acting as scientific advisers to the team. An independent revision was conducted by a team at the Friedman School of Nutrition Science and Policy, Tufts University.

The initial database and website searches took place between 1 November 2015 and 31 March 2016.

The full version of the evidence synthesis, which forms part of a series covering child protection, market support, mental health, nutrition, pastoralist livelihoods, shelter, urban contexts, and water, sanitation and hygiene, can be accessed from:

- https://www.gov.uk/dfid-research-outputs
- http://fic.tufts.edu/research-item/the-humanitarian-evidence-program/
- http://policy-practice.oxfam.org.uk/our-work/humanitarian/humanitarian-evidence-programme.

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Photo credit

Azel, Niger. Abbie Trayler-Smith/Oxfam. March 2015.

0 EXECUTIVE SUMMARY

This systematic review, commissioned by the Humanitarian Evidence Programme (HEP) and carried out by a research team from the University of Sheffield, represents the first 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.[1]

Definitions and scope

Severe acute malnutrition (SAM, or severe wasting) and moderate acute malnutrition (MAM, or moderate wasting) affect 52 million children under five years of age around the globe. 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 SAM and 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.

For the purposes of this review:

- **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 (GNC, 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.

The research team:

- mapped and documented existing research;
- synthesized the evidence in response to two key research questions:
  - the relationship between recovery and relapse; and the relationship between relapse and default or return default/episodes of default
  - the reasons for default and relapse or return defaults/episodes of default; and
- identified gaps in existing research and knowledge.

What evidence was eligible for review?

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. Following the removal of duplicates, screening and 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 reported on quantitative outcomes and two contained both quantitative and qualitative outcomes. The 22 quantitative studies included eight clinical efficacy and effectiveness trials using randomized controlled designs, seven observational cohort studies and seven programme evaluation reports.

[1] HEP is a partnership between Oxfam GB and Feinstein International Center at the Friedman School of Nutrition Science and Policy, Tufts University. It is funded by the United Kingdom government's Department for International Development (DFID) through the Humanitarian Innovation and Evidence Programme (HIEP).

What are the 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 0.1 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.

Figure 0.1: Relapse rates and relationship between relapse and default

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 SAM and 8 percent for children with 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.

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 0.2). 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.

Figure 0.2: Reasons for default reported in studies

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.

What is the state of the evidence on acute malnutrition?

This review found little evidence on the impact of programmes implemented to manage MAM and SAM in emergencies, which can be partly explained by the nature of interventions conducted in humanitarian settings. Also, it found few studies that 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, and were therefore left out of this review. It is possible that nutritional emergencies exist in non-humanitarian settings, often as a result of inequities related to poverty. For example, India has the highest number of acutely malnourished children under five in the world – 25,461,000 – but this is not considered a humanitarian emergency.

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.

Overall conclusions

This review identified 24 publications and programme reports that reported recovery, relapse and default and reasons for recovery and default in the management of acute malnutrition in humanitarian emergencies. Assessment of these publications did not provide sufficient information for conclusions to be drawn in relation to the review questions.

- The relationship between recovery and relapse; and between relapse and default or return default/episodes of default: **The evidence related to this theme is inconclusive.**
- Reasons for default and relapse or return defaults/episodes of default: **The strength of evidence relating to this theme is limited.**

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 (FBFs) or corn/soy blends (CSBs), has the potential to improve nutritional recovery in children suffering from MAM. However, the weight gain reported for children given RUSFs or CSBs was small. No significant differences in mortality rates were reported for children who received RUSF compared with children in CSB 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 (CMAM), 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.

A number of research gaps were identified during this review. In particular, 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.

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Oxfam GB, Oxfam House, John Smith Drive, Cowley, Oxford, OX4 2JY, UK.

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