



Looking beyond “Survive” to “Thrive” in treatment of malnutrition

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Malnutrition remains a major public health concern in the world today. Estimates from 2014 show that out of 667 million children under 5, 159 were stunted, and 50 million were wasted (1). Severe wasting, which indicates the presence of severe acute malnutrition (SAM), affects 16 million children. There have been some recent improvements, with reductions in malnutrition globally, but these changes are not happening fast enough or across all world regions. Africa in particular has shown slow progress in reducing malnutrition, and no subregion in Africa currently has an acceptable level of wasting. This is a major concern as children with SAM have 10-fold higher risk of death compared to children without malnutrition (2). More than half a million deaths in children under five each year are attributable to severe wasting, constituting 7.4% of childhood deaths in this age group (3). This is a horrific statistic, particularly in our world where 41 million children are overweight (1). Tackling malnutrition has therefore rightly been an important focus of both the Millennium Development Goals and the recently agreed Sustainable Development Goals.

The devastating consequences on SAM on mortality in children are therefore clear. Less is known, however, about long-term impact of SAM on health and quality of life of survivors. The paper by Lelijveld *et al.* is therefore a welcome addition to the literature on SAM (4).

The study assessed the long-term consequences of SAM in Malawi. In 2006/2007, 1,024 children were admitted for treatment of SAM at the Queen Elizabeth Central Hospital in Blantyre, in Malawi and were included in the study. The children were relatively young, with a median age at admission of 22 months. The children were first treated in-

patient with therapeutic milk to help them to stabilize and were then given nutritional rehabilitation at home with ready-to-use therapeutic food. The children were followed up twice: first at one year and then after 7 years. Important lessons can be learnt from both follow-up phases.

At the first follow-up, the authors found that shockingly, despite the admission to hospital, 427 (42%) of the children died during or after treatment (5). Two groups of children were particularly vulnerable to dying after SAM. The first were children who were HIV+, making up 274 (62%) of the children who died. The second group was children with disabilities who were HIV negative, who were 2.8 times more likely to die during follow-up than children without disabilities (95% CI, 1.4–5.3).

Children who are HIV+ are clearly at increased risk of mortality, and severe malnutrition may signal that their disease has reached an end-stage. Better control of HIV will therefore help these children to avoid malnutrition and survive for longer. Children with disabilities are more vulnerable to malnutrition for a variety of reasons, including physical difficulties in feeding or swallowing (e.g., among children with cerebral palsy), neglect, or exclusion from feeding programmes (6). These same factors may also make them more likely to die as a consequence of malnutrition. Children with disabilities therefore need to be an important focus of malnutrition prevention and treatment programmes, and perhaps even specifically targeted with appropriate interventions. These findings also show that a holistic view on SAM management is needed, so that children with HIV and/or disability are provided with feeding support as part of their routine care.

After 7 years of follow up, a further 46 children had

died, and again the most vulnerable groups were children who were HIV+ and those who had clinically obvious disabilities (4). The second follow-up focused more on long-term impact of SAM on health outcomes, however, rather than on mortality. In order to understand these impacts the authors compared 352 surviving children who had experienced SAM at baseline to 217 sibling controls and 184 community controls.

The results clearly showed that even in the long-term, children with SAM in early life were more likely to be stunted than either control groups, even in this setting of widespread malnutrition. But the differences between the groups went beyond nutritional status alone. Cases were around twice as likely to be in a lower school grade as either peers in their community or their nearest age sibling. Evidence also suggested that the body composition was less healthy among cases than controls, with less lean mass and relatively higher waist to hip measures. These anthropometric features may predispose these children to developing non communicable diseases (NCDs) later in life (7), although at this young age group there were no differences in NCDs measures between cases and controls. The authors also showed that cases had long-term functional impairments compared to controls, included poorer physical strength (measured by hand grip) and poorer physical capacity (estimated by steps per hour).

The findings have important implications for the treatment of SAM. On the positive side, there was evidence of catch-up growth among the cases, which together with the lack of impact on NCD risk factors suggest that treatments for SAM can work. A key question is whether this recovery can be improved further, for instance through intake of high quality proteins and/or zinc (8). More evidence is needed here. What is worrying is that this study showed the long-term impact of SAM in children's lives. More is needed to tackle the root cause of malnutrition and to scale up treatment for children with SAM. But beyond that, more holistic care is needed to deal with the long-term consequences of SAM; for instance the impact on schooling suggests that a focus on early child development may be needed to counteract the impact of SAM.

I therefore heartily endorse the authors' conclusion that "It is no longer sufficient for children affected by SAM to just survive: interventions must also help them to thrive." (4). Now we need more evidence on how to achieve this aim, and to ensure these interventions reach all children, including those with disabilities (9,10).

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