

# 'Severe malnutrition': thinking deeply, communicating simply

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**To cite:** Kerac M, McGrath M, Connell N, *et al.* 'Severe malnutrition': thinking deeply, communicating simply. *BMJ Global Health* 2020;**5**:e003023. doi:10.1136/bmjgh-2020-003023

**Handling editor** Seye Abimbola

Received 28 May 2020

Revised 14 August 2020

Accepted 28 September 2020

## INTRODUCTION

Malnutrition affects millions worldwide and underlies almost half of deaths in children aged <5 years.<sup>1</sup> Progress towards Sustainable Development Goal 2 (End hunger) was already slow but coronavirus-related secondary impacts now threaten nutritional crises described as:

*Biblical, on steroids, across generations.*<sup>2</sup>

Towards effective actions, effective communication matters. Malnutrition involves a plethora of complex technical terminology. Sometimes it helps to go beyond details and consider problems at broader scale, especially when engaging with non-specialist stakeholders like policymakers, funders and the public. These may not wish to know full technical nuances, but they should:

- ▶ appreciate why malnutrition matters.
- ▶ hear clear, consistent messages: else they will turn to other global-health issues perceived as more straightforward.

Focusing on undernutrition, we argue that a simple umbrella term, 'Severe Malnutrition' would benefit future communication and advocacy efforts.

## DEFINING MALNUTRITION: LIMITATIONS OF CURRENT TERMINOLOGY

Defining a problem is vital for effective action/evaluation. Assessing both individual and population nutritional status typically involves anthropometry.<sup>3</sup> Measurements (eg, weight) are interpreted through indices (eg, weight-for-age) in comparison with reference populations (eg, WHO Growth Standards, a 'gold standard' describing how healthy children *should* grow). Current terminology is summarised below.<sup>1</sup>

Often neglected is the full definition of malnutrition: 'Any condition in which deficiency, excess or imbalance of energy, protein or other nutrients...adversely affects body

## Summary box

- ▶ Child malnutrition is a major global public health problem which risks significant worsening with COVID-19.
- ▶ Current terminology is complex and limits effective communications and programme actions.
- ▶ 'Severe malnutrition' is a simple, advocacy-focused term in which the 'severe' highlights high risk of mortality/morbidity and encompasses different manifestations of malnutrition, context-appropriate anthropometric cut-offs and underlying causes.
- ▶ Advantages include improved clarity and familiarity; a focus on clinically important severe outcomes and potential to increase interprogramme linkages and synergies

function and/or clinical outcome'.<sup>4</sup> Problems consequently arise.

## Undue focus on body size

Being severely small (short or thin) alone is unimportant. What matters is the associated *risk* of severe adverse outcome (eg, death/disease/developmental delay). Simplicity makes anthropometry useful for epidemiological and clinical case-definitions. Often forgotten is that it is an indirect measure, akin to a proxy measure, an indicator of an underlying problem, analogous to spots in measles or fever in malaria. Better measures of nutritional status such as body composition are available,<sup>5</sup> but are costly and difficult to do in most field settings. Anthropometry is valuable but has imperfect:

- ▶ *Sensitivity*: current global metrics focus on population extremes, with terms in [table 1](#) often used interchangeably. Not differentiating *state* from *process* identifies most children with malnutrition but misses those with 'normal' anthropometry who are deteriorating and are smaller than they would be in a resource-rich environment and therefore at risk



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**Table 1** Case definitions and anthropometric indicators in global health policy/practice

Anthropometric indicator	Process of deterioration	State if low*	Commonly interpreted as
Height-for-age	Stunting	Stunted	Chronic malnutrition
Weight-for-age	Growth faltering	Underweight	Mixed acute/chronic malnutrition
Weight-for-height (BMI in older children)	Wasting	Wasted	Acute malnutrition†

\*Severe deficit= $<-3z$ -scores (standard deviations) from WHO Growth standards median. Moderate deficit= $-3$  to  $<-2z$ -scores;  $-2$  to  $+2$ =‘normal’.

†Bilateral oedema is also used to define oedematous severe acute malnutrition (kwashiorkor). BMI, body mass index.

of adverse outcomes (false negative). Thus, true malnutrition-associated burden of disease is underestimated. Neglecting process also risks undue focus on treatment rather than prevention since actions may not occur until a child deteriorates below threshold values.

- ▶ *Specificity*: some children are constitutionally small but have no functional/clinical impairment or increased risk (false positive). In others, the underlying problem is not lack of food but another issue (eg, repeated infection, chronic inflammation and disability). Feeding may temporarily increase weight, but relapse follows if the underlying cause is not addressed.

**Nutrition ‘tribalism’**

Different anthropometric deficits are commonly managed by different communities. UN/NGO actors are especially prone to division:

- ▶ *Stunting*, often equated with ‘chronic malnutrition’, is high priority for *development* actors.
- ▶ *Wasting*, often equated with ‘acute malnutrition’, is high priority for *humanitarian* actors.

- ▶ *Underweight* is widely measured in Growth Monitoring Programmes but not elsewhere, hence impeding interprogramme referrals.
- ▶ *Micronutrient malnutrition* is often neglected in the above.

This is unfortunate, as actions on common risk factors and common determinants are too easily missed or diluted.

**Inadequate consideration of context**

Different individuals and populations may have the same anthropometry but varying levels of risk. Context details are important, yet are often overlooked, for example,

- ▶ *Humanitarian emergencies* can lead to sudden deterioration in weight so that even a *mild/moderate* deficit has high associated risk.
- ▶ *Suboptimal but stable contexts* can be associated with populations/individual adaptation and may not have correspondingly high morbidity/mortality.

**Table 2** Severe malnutrition definition

**SEVERE MALNUTRITION**  
= ‘Any form of malnutrition (undernutrition) associated with high risk of severe adverse outcomes’

This encompasses different:		
Criteria (manifestations/forms of malnutrition)	Cut-offs	Causes
<ul style="list-style-type: none"> <li>▶ <b>Stunting</b>: low height-for-age</li> <li>▶ <b>Underweight</b>: low weight-for-age</li> <li>▶ <b>Wasting</b>: low weight-for-length/height</li> <li>▶ <b>Low MUAC</b> (mid-upper arm circumference)</li> <li>▶ <b>CONCURRENCE</b> of above</li> </ul> <p>Also included are:</p> <ul style="list-style-type: none"> <li>▶ <b>Oedematous malnutrition</b> (kwashiorkor)</li> <li>▶ <b>Micronutrient malnutrition*</b></li> </ul>	<p>In <b>most contexts</b>, standard anthropometric cut-offs apply:</p> <ul style="list-style-type: none"> <li>▶ <math>&lt;-3z</math>=severe deficit=high risk</li> <li>▶ <math>&lt;-2z</math>=moderate deficit=moderate risk but <i>could</i> be high risk in <i>some</i> settings (eg, humanitarian) and for <i>some</i> children (eg, those with underlying illness)</li> <li>▶ MUAC (for ages 6–59 months): <math>&lt;125\text{mm}</math>=low; <math>&lt;115\text{mm}</math>=very low</li> </ul> <p>There is also <b>flexibility</b> to use other cutoffs, determined by severity of outcome.</p>	<p><b>Imbalance of nutrients vs requirements</b> is key, but cause(s) <b>must also</b> be considered:</p> <ul style="list-style-type: none"> <li>▶ ↓ <b>availability of food</b> eg, seasonal variation; humanitarian crisis</li> <li>▶ <b>In-utero insults</b> eg, reflected by low birth weight</li> <li>▶ <b>Underlying disease</b> causing: ↓ <b>intake</b> (eg, disability causing swallow problems) <b>and/or</b> ↓ <b>absorption</b> (eg, gut disorders) <b>and/or</b> ↑ <b>utilisation</b> (eg, acute infection, chronic infection like TB or HIV or heart disease)</li> <li>▶ <b>Prevention and care services</b></li> </ul>

\*Space does not allow full discussion of micronutrients, but these are common alongside other forms of malnutrition and should always be considered.

## SEVERE MALNUTRITION

By *Severe Malnutrition* we mean (Table 2):

Benefits of this term include the following.

### Focus on severe adverse outcomes

An important clinical maxim is to ‘treat the patient, not the numbers’. The ultimate aim of any intervention is to ensure children not only survive but thrive. *Severe* in our framework refers to clinically important *severe adverse outcomes*: mortality, morbidity, impaired development. To capture true programme impact, these should be measured wherever possible (since some interventions might improve anthropometry but not mortality;<sup>6</sup> others improve nutrition but not anthropometry).<sup>7</sup> The framework also highlights underlying clinical causes because acute/chronic illness and anthropometric deficits are intimately related: deficits are associated with increased risk of and impaired response to illnesses; illness can exacerbate anthropometric deficit.

### Inclusivity (including of long-term consequences)

Different manifestations of malnutrition are more-common or less-common/important in different settings but details are mainly relevant to technical audiences. While widely understood to mean undernutrition, we acknowledge that malnutrition is also used to describe overweight. Severe overweight is widely recognised as obesity so our using ‘severe malnutrition’ does not risk misunderstanding. It does create opportunities to highlight long term consequences of undernutrition: speaking about *mal* rather than *under*nutrition is a reminder that early-life undernutrition increases susceptibility to the harmful effects of adult overweight, especially elevated non-communicable non-communicable disease.<sup>8</sup>

### Increased linkages and synergies between different nutrition-related programmes

Working towards common mortality/morbidity goals could facilitate interprogramme linkages and more efficient resource utilisation.

‘Severe malnutrition’ also provides bridging language supporting recent research on relationships between different malnutrition manifestations:

- ▶ Wasting predisposes to stunting<sup>9</sup>—‘chronic’ terminology under-recognises the role of acute insults.
- ▶ Wasting is common in children with low birth weight and disability<sup>10</sup> and many wasted children are stunted—‘acute’ terminology is usually erroneous.
- ▶ Children with concurrent wasting/stunting are at particularly high risk of death<sup>11</sup>—programmes should be integrated.

Since all forms of malnutrition are fundamentally social problems of poverty and inequity, our terminology also emphasises the importance of tackling these common determinants.<sup>12</sup>

### Clarity and familiarity

Both ‘severe’ and ‘malnutrition’ are widely understood terms and are easily translatable into most languages

worldwide. ‘Severe malnutrition’ also has historical track-record, having been used alongside older case definitions with different growth references and classifications predating table 1. Children admitted to today’s malnutrition programmes differ to those in years past, but common characteristics are increased mortality/health risks compared with those without anthropometric deficit.

### Keeping technical arguments internal

As in any field, some issues are novel and/or contested for example.

- ▶ Use of weight-for-age to identify concurrent wasting/stunting.<sup>11</sup>
- ▶ Mid-upper arm circumference versus weight-for-height to identify children for therapeutic feeding.<sup>13</sup>
- ▶ Recent focus on ‘wasting’ terminology neglects kwashiorkor.<sup>14</sup>

An overarching term provides stability and prevents important technical arguments giving the impression to those outside the sector that experts do not agree on other core issues.

### Flexibility for programmes to use locally appropriate admission criteria

Guided by local mortality/morbidity data, individual countries could be freer to set context-specific *programme admission criteria* for ‘severe malnutrition’.

- ▶ In some settings, even mild/moderate anthropometric deficits are associated with excess mortality: integrated programmes treating both severe and moderate wasting as a continuum are hence important.<sup>15</sup>
- ▶ In other settings, mortality associated with anthropometric deficit is lower - costs of therapeutic/supplementary foods may not justify their benefits.<sup>16</sup>

For most technical purposes, quantifying and monitoring global trends and comparisons, current metrics focusing on table 1 terminology remain valid. However, discussions are needed on measuring risk; moving beyond the acute/chronic malnutrition dichotomy; feasibility of improved metrics<sup>17</sup> and calculating a single global estimate of the burden of severe malnutrition.

## CONCLUSIONS

In summary, ‘severe malnutrition’ allows for clear, simple communication but simultaneous deep thinking about malnutrition. It should complement rather than replace current terminology. As well as better engaging non-specialists, it should also inspire technical audiences to debate and consider more carefully the pros and cons of current terminology, notably the need to move towards risk-focused rather than body-size-focused language. It thus supports the urgent need for interest, action and investment in one of the world’s most serious global health issues.

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**Contributors** MK: conceived concept for the commentary, wrote first draft and led on updating subsequent versions following coauthor comments/discussions, approved final published version and is accountable for the work. MM, NC, CK, WHM, JB, RB, JIAB, AB, SC, TG and JCW coconceived ideas and concepts in the commentary; commented on and contributed to drafts of manuscript; approved/are accountable for final version to be published.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** There are no data in this work.

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