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# Towards a Multi-Dimensional Index of Child Growth to Combat the Double Burden of Malnutrition

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## Keywords

Multi-dimensional · Capability approach · Child growth · Double burden of malnutrition

## Abstract

**Background:** There is growing awareness in the field of public health that combatting the double burden of malnutrition requires approaches that address its multi-dimensional origin, rather than focusing primarily on the biomedical domain. Current frameworks of malnutrition like the UNICEF conceptual framework, and the Lancet Series 2013 framework have been instrumental in understanding the determinants of malnutrition and developing appropriate interventions. However, these frameworks fail to explicitly address issues of agency, that is, about being able to pursue one’s goal. The capability approach as originally developed by Amartya Sen includes agency in the causal chain. **Summary and key Messages:** In the past 5 years, the International Union of Nutritional Sciences Task Force “Towards a multi-dimensional index for child growth and development” has developed a capability framework for child growth, and conducted empirical research applying this framework. The working group discussed what would be needed to further develop the approach and explained the added value to international organisations and policy makers. We suggest developing an index of advantage that will be a proxy for a

child’s agency. We hypothesise that such an index will explain much of the variance in studying inequalities in child nutrition and thus call for action to improve this focal point.

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## Introduction

The fact that combatting the double burden of malnutrition (DBM) requires approaches that address its multi-dimensional origin, rather than focusing primarily on the biomedical domain, is increasingly being recognised in

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the field of nutrition and public health. Current frameworks of malnutrition, such as the UNICEF conceptual framework [1] and the framework for actions to achieve optimum foetal and child nutrition and development presented in the Lancet Series in 2013 [2] have been instrumental in understanding malnutrition and its determinants at individual, household and societal level, and developing appropriate interventions.

### A Capability Approach to Child Growth

Over the past 5 years, the International Union of Nutritional Sciences Task Force “Towards a multi-dimensional index of child growth” has developed a conceptual framework for a multi-dimensional approach to child growth [3–5]. This framework aims to provide a means of operationalizing the contemporary understanding of the complex nature of malnutrition in its manifestations as undernutrition and overweight. In developing the framework, the capability approach provided the major underpinning of the efforts. The capability approach was originally developed by Amartya Sen [6, 7] and further developed by Martha Nussbaum [8], and has been applied in different fields such as disability [9], education [10, 11], gender inequality [12], poverty [13, 14], healthy ageing [15, 16], well-being in adults [17–19] and in children [20–23], and health [24]. The Convention of the Rights of the Child [25] served as the initial source for identification of potential dimensions that could be included in such an index [3]. Further resources for developing the framework were provided by the nutrition transition theory, which identified the role of macro-level societal and political processes in the current obesity epidemic [26], as did new developments in life history theory that are seeking physiological explanations of the intergenerational transfer of metabolic predisposition, linking low birth weight with later adverse health outcomes [27, 28].

Two activities by the Task Force to learn more about the application of the capability approach in nutrition consisted of (i) ethnographic research examining the role of parental and child capabilities in child growth in Tanzania [29] and Bangladesh (unpublished data), and (ii) empirical analysis of a demographic health survey from India (unpublished data). The latter yields important insights about the analytic challenges of applying the approach to population data that included data on nutritional status.

The working group was organised to take this work to the next level. Further operationalization of the framework and applying appropriate quantitative modelling tech-

niques are required. The development of the human development index [30], and the empirical work of Anand and Roope [22] applying the capability approach to child well-being provide a model for child growth. In the capability approach, the emphasis is on “what people *are able to do and be* to live the life they value”. Attendees discussed what additional concepts should be added in addition to those that have already been used in frameworks for child health and other areas. Considerable discussion was devoted to issues related to “empowerment”. The rationale for focusing on “empowerment” is based on the proposition that parents’ capability to act upon the determinants of growth involve certain prerequisites that can be captured by the idea of “agency” (being *able to pursue one’s goals*) [31]. Till date, this fundamental idea has not received attention in the frameworks developed for malnutrition.

Although the concept of a multi-dimensional, capability-grounded approach to child growth has been shared with the wider nutrition community [3, 4, 29], its utility for policy and social programmes depends on its translation into an operational tool. The working group discussed the next steps to achieve this, particularly in the context of the DBM.

Starting with the UNICEF and the Lancet Series frameworks [1, 2], and recognising the importance of power issues at stake at each of the levels of the frameworks, the task requires elucidating the manifestations of “agency” or “the ability to pursue one’s goals” in achieving healthy child growth. People are agents. Thus, the effort to expand the framework requires working with people as early in the process as possible. In other words, the research must include the perspective of various stakeholders, including parents, health professionals and policy makers, to understand the constraints that are actively (dis)empowering societies, households, and parents in relation to children’s growth.

Data is required to initiate discussions on this complex issue. The group suggested conducting an analysis with a “sufficiently rich” database (in terms of contextual data) and including an index of (dis)advantage that would show how diverse constraints on societies, households, and mothers feed through to poor growth of children. Such an index could include national level data (e.g., recent exposure to war/civil conflict/natural disaster, gender equality, rates of violence against women, proportion of imported – processed – foods) as well as individual level data (e.g., shelter, time allocation of carers, breastfeeding success).

Another key discussion topic at the working group session was the issue of context. Although the pathways to

healthy growth may, to some extent, be universal, a contextual lens is needed to make sense of conditions on the ground and to develop interventions that are aligned with cultural beliefs, expectations and conditions. The example of when a child should achieve the developmental marker of walking is illustrative. This is a universal capability that is valued for all children. However, to guide parents in this learning process, walking should be understood from the perspective of mothers and fathers. Similarly, the capability to adequately feed one's children is universal; but we know that in every society there are foods that are not given to children [32]. The rationale for judgments about the suitability of specific foods for children at particular ages and developmental stages needs to be understood and considered in interventions to improve feeding practices. Contextual knowledge about these and related topics needs to be integrated in a capability approach that aims to support the design of interventions.

In the adult capability literature, the focus is on individual capabilities. However, children are highly dependent on their parents, who are, in turn, affected by the societal conditions in which they live. This not only involves current conditions, but the past conditions in which the parents grew up. There is an expanding body of data to show that a mother who frequently experienced hunger when she was young has a limited capability to provide a healthy intra-uterine environment for her child [33]. Thus, a multi-dimensional index of child growth has to include not only capabilities at the child level, but also parental level conditions, considered in a larger time perspective.

A critical issue for combatting the DBM is attention to "*doing no harm*". Difficult questions need to be examined, including the fundamental question of whether well-intended nutrition education in a situation where a mother is not able to pay for the suggested food changes is doing harm. Asking the community about what they *can* do, rather than telling them what to do, is one strategy to mitigate harm. A focus on parental capabilities offers a powerful tool to nutrition educators and policy makers to address what people *can* do. It will guide us to decide on "the right strategy" and "the right intervention".

Participants at the session noted that a multi-dimensional index can be used for monitoring purposes, specifically for public health practice. But it will also be valuable for larger policy and planning at multiple levels. The group discussed the idea that the approach resonates with earlier initiatives, such as a rights-based approach [34] or positive deviance [35, 36]. For example, a demonstration of resilience in children who are positively deviant in growth provides direction for decisions about where to

target an intervention. Moreover, a multi-dimensional index does more than this: given what is known about the multiple determinants of growth, it will demonstrate that a child is never "achieving poorly" on only one dimension, but rather is likely to be achieving poorly on a range of dimensions. This demonstration, in a well-constructed index, will have many implications for programme planning and policy that will draw attention to the need for coordinated planning.

Concerning the utility of a multi-dimensional set of indicators, the working group's discussion stressed that it will have utility at local and regional levels as well as at the national level. A multi-dimensional or capability approach to child growth could serve as a monitoring tool and as a model for the development of interventions.

Finally, the working group stressed the value of the capability approach for assessing progress and barriers to progress on common national indicators. Explicitly addressing issues of (dis)advantage and (dis)empowerment will shed light on what we intuitively know but nevertheless fail to address in relation to the DBM: the issue of who is accountable.

## Conclusion

In conclusion, to take the capability framework to the next level, it will need to be further operationalized. Subsequently, empirical analysis applying econometric analytical techniques and using an existing "rich" dataset should be conducted to derive easily understood charts and graphs that help to reveal barriers that constrain people from choosing growth-promoting choices. Finally, the multi-dimensional index should be tested in several settings.

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## Statement of Ethics

The authors have no ethical conflicts to disclose for this review because there were no humans or animals involved directly.

## Disclosure Statement

The authors declare that they have no conflicts of interest to disclose.

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## Author Contributions

All authors contributed to the conception of the work; L.K. provided the session notes; H.H. wrote the first draft of the paper; G.P. made a second draft; all authors subsequently critically revised it for important intellectual content; all authors approved of its current version and agreed to be accountable for all aspects of the work.

## References

- 1 UNICEF. *A UNICEF policy review: Strategy for improved nutrition of children and women in developing countries*. New York: Unicef; 1990.
- 2 Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al.; Maternal and Child Nutrition Study Group. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*. 2013 Aug;382(9890):427–51.
- 3 Haisma H, Yousefzadeh S, Boele Van Hensbroek P. Towards a capability approach to child growth: A theoretical framework. *Matern Child Nutr*. 2018 Apr;14(2):e12534.
- 4 Yousefzadeh S, Biggeri M, Arciprete C, Haisma H. A capability approach to child growth. *Child Indic Res*. 2018.
- 5 Haisma H, Yousefzadeh S. Annual reports of the IUNS Task Force "Towards a multi-dimensional index to child growth". 2013 - 2017.
- 6 Sen A. *Commodities and capabilities*. Amsterdam: North-Holland; 1985.
- 7 Sen A. Development as capability expansion. In: Griffin K, Knight J, editors. *Human development and the international development strategy for the 1990s London*. Macmillan; 1990. pp. 41–58.
- 8 Nussbaum MC, Sen A. *The quality of life*. Oxford: Clarendon Press; 1993.
- 9 Mitra S. The capability approach and disability. *J Disabil Policy Stud*. 2006;16(4):236–47.
- 10 Hart CS, Brando N. A capability approach to children's well-being, agency and participatory rights in education. *Eur J Educ*. 2018 Sep;53(3):293–309.
- 11 Saito M. Amartya Sen's capability approach to education: A critical exploration. *J Philos Educ*. 2003;37(1):17–33.
- 12 Robeyns I. Sen's Capability Approach and Gender Inequality: Selecting Relevant Capabilities. *Fem Econ*. 2011;9(2-3):61–92.
- 13 Yousefzadeh Daal Faghata S, Gossmann F. Local Needs and Global Indicators: A Contextual Approach to Multidimensional Child Deprivation. *Ethical Perspect*. 2016;23(1):165–82.
- 14 Laderchi CR, Saith R, Stewart F. Does it matter that we do not agree on the definition of poverty? A comparison of four approaches. *Oxf Dev Stud*. 2003;31(3):243–74.
- 15 Stephens C, Breheny M, Mansvelt J. Healthy ageing from the perspective of older people: a capability approach to resilience. *Psychol Health*. 2015;30(6):715–31.
- 16 Meijering L, van Hoven B, Yousefzadeh S. "I Think I'm Better at it Myself": The Capability Approach and Being Independent in Later Life. *Research on Ageing and Social Policy*. 2019;7(1):229–58.
- 17 Sen A. Capability and well-being. In: Nussbaum MC, Sen A, editors. *The quality of life Oxford*. Clarendon Press; 1993. pp. 30–53.
- 18 Al-Janabi H, Flynn TN, Coast J. Development of a self-report measure of capability wellbeing for adults: the ICECAP-A. *Qual Life Res*. 2012 Feb;21(1):167–76.
- 19 Anand P, Hunter G, Carter I, Dowding K, Guala F, van Hees M. The development of capability indicators. *J Human Dev Capabil*. 2009;10(1):125–52.
- 20 Biggeri M, Anich R. The deprivation of street children in Kampala: can the capability approach and participatory methods unlock a new perspective in research and decision making? *Mondes Dev*. 2009;146(2):73–93.
- 21 Biggeri M, Ballet J, Comim F, editors. *Children and the Capability Approach*. New York: Palgrave Macmillan; 2011. <https://doi.org/10.1057/9780230308374>.
- 22 Anand P, Roope L. The development and happiness of very young children. *Soc Choice Welfare*. 2016;47(4):825–51.
- 23 Dominguez-Serrano M, del Moral Espin L. From relevant capabilities to relevant indicators: defining an indicator system for children's well-being in Spain. *Child Indic Res*. 2018;11(1):1–25.
- 24 Venkatapuram S. *Health Justice: An Argument from the Capability Approach*. PhD ed. Cambridge: Wiley; 2011.
- 25 United Nations General Assembly. Convention of the Rights of the Child. Resolution 44/25, 1989.
- 26 Popkin BM, Adair LS, Ng SW. Global nutrition transition and the pandemic of obesity in developing countries. *Nutr Rev*. 2012 Jan;70(1):3–21.
- 27 Wells JC, Stock JT. Re-examining heritability: genetics, life history and plasticity. *Trends Endocrinol Metab*. 2011 Oct;22(10):421–8.
- 28 Wells JC, Yao P, Williams JE, Gayner R. Maternal investment, life-history strategy of the offspring and adult chronic disease risk in South Asian women in the UK. *Evol Med Public Health*. 2016 Apr;2016(1):133–45.
- 29 Mchome Z, Bailey A, Darak S, Haisma H. "A child may be tall but stunted." Meanings attached to childhood height in Tanzania. *Matern Child Nutr*. 2019 Jul;15(3):e12769.
- 30 Alkire S, Santos ME. Acute multidimensional poverty: A new index for developing countries. Proceedings of the German Development Economics Conference 2011(3).
- 31 Ballet J, Biggeri M, Comim F. Children's agency and the capability approach: A conceptual framework. In: Ballet J, Biggeri M, Comim F, editors. *Children and the capability approach London: Palgrave Macmillan*. 2011. pp. 22–45.
- 32 Pelto GH, Levitt E, Thairu L. Improving feeding practices: current patterns, common constraints, and the design of interventions. *Food Nutr Bull*. 2003 Mar;24(1):45–82.
- 33 Cnattingius S, Villamor E, Lagerros YT, Wikström AK, Granath F. High birth weight and obesity—a vicious circle across generations. *Int J Obes*. 2012 Oct;36(10):1320–4.
- 34 Jonsson U. UNICEF. *Human Rights Approach to Development Programming*. UNICEF; 2003.
- 35 Zeitlin M, Ghassemi H, Mansour M. *Positive deviance in child nutrition with emphasis on psychosocial and behavioral aspects and implications for development*. Tokyo: The United Nations University; 1990.
- 36 Zeitlin M. Nutritional resilience in a hostile environment: positive deviance in child nutrition. *Nutr Rev*. 1991 Sep;49(9):259–68.

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