

Multidimensional Index for Child Growth and Development

Report Form 2024



Task Force Chair/s

- Hinke Haisma, University of Groningen, Netherlands
- Gretel Pelto, Cornell University, USA (co-chair)

Task Force Members

- Barnali (Chumki) Chakraborty - North South University, Dhaka, Bangladesh;
- Shirish Darak, Prayas Health Group, Pune, India;
- Ali Dhansay - South African Medical Research Council and Stellenbosch University, Cape Town, South Africa (Council member)
- Rolando Gonzales Martinez, Marie Skłodowska-Curie Actions postdoctoral researcher, University of Groningen, Netherlands;
- Zaina Mchome - National Institute for Medical Research, Mwanza, Tanzania;
- Sridhar Venkatapuram - King's College, London, UK;

(No changes since last year)

Has your objective(s) as a task force been modified since the original proposal? If so, please provide brief justification.

There have been no changes in objectives.

Have the activities to be undertaken been modified since the original proposal? If so, please provide brief overview and justification.

There has been a continuous development of activities to meet the objectives, see report below.

Brief Overview of activities since last annual report

Activities focused on:

- Implementation of a multidimensional approach for child growth;
- Next phase of research planning;
- Identification of opportunities for research and networking grants.

Members of the Task Force met monthly to discuss progress on publications, project admin, policy translation activities, and future plans.

Across countries :

As part of the implementation activities, we specifically focussed on identifying those children most in need for interventions using the multidimensional index for child growth. Typically, interventions on child malnutrition are developed with the aim to maximise the number of children who benefit; however, the worst off children may not necessarily be reached. The Task Force is looking at the characteristics of those children that are in the lower tail of the distribution for malnutrition. They use both traditional measures for child malnutrition (stunting) as well as the multidimensional approach. This will help demonstrate how the multidimensional approach differs and adds to the traditional measures of child malnutrition.

To this end, a master's student in Population Studies at University of Groningen, is currently investigating: What are the key characteristics of the worst-off children regarding child growth when identified using a multidimensional framework compared to traditional stunting measures? (Nov 2024 - April 2025).

She is using both DHS data and data from the Young Lives Survey (Oxford University) and focusing on Peru. This work will also feed into the proposal for a new task force for the new term (2025-2029).

Additionally, A Bayesian approach with priors based on machine learning and deep learning was developed to identify which environmental, household and child-level variables can prevent stunting and promote child growth.

--> Netherlands

The introduction of the digital portfolio¹ for child healthcare has resulted in a disconnect between the various domains of child development. A multidimensional dashboard or index would open up the access to the various domains by health care professionals and allow them to adequately respond to developmental challenges, including child growth, in early life.

Activities:

- A project for bachelor's students in Public Health Sciences, Maastricht University;
- A research project for Youth Health Care experts in training, Maastricht University/ University of Groningen;
- Meetings and presentations at municipal health services, the Dutch Centre for Youth Health (responsible for guidelines for professionals), and TNO Child Health;
- Building of an app for parents to monitor the growth of their child in a multidimensional way (with Health Hub Roden).

They work towards the building of a consortium for a grant application towards the implementation of a multidimensional approach for child growth in the Netherlands.



--> Tanzania

- Two policy briefs on childhood stunting and child growth monitoring are in finalization stage. Upon finalization, the **policy briefs** will be submitted by NIMR to the Tanzania Ministry of Health.
- The team is working on a grant proposal aiming to promote child safety and good nutrition under the **housemaid's care**.
- The team is developing a grant proposal that employs a bottom-up approach to generating evidence for designing norm-shifting interventions aimed at preventing and addressing intimate partner violence (IPV) against women during pregnancy and the early postnatal period.

--> Bangladesh

TA small seed grant has been approved by North South University, Bangladesh for collecting data on multidimensional child growth from the **indigenous communities** of Chittagong Hill Tracts of Bangladesh. Barnali (Chumki) will implement the project.

--> Vietnam

A Bayesian approach with priors based on machine learning and deep learning was developed to identify which environmental, household and child-level variables can prevent stunting and promote child growth.

An ethnological study will be performed to analyze the present and possible future impact of climate change and other environmental factors on food availability and nutrition patterns.

Presentations at conferences:

- Barnali Chakraborty participated in the 5-day' workshop of Training of Trainers on climate change and nutrition arranged by ANH Academy (Agriculture, Nutrition, and Health) and facilitated by the faculties and researchers of the London School of Hygiene and Tropical Medicine (LSHTM), UK, held in Colombo, Sri Lanka, from 25 November to 29 December 2024. After the completion of the course, she has been certified as the regional trainer of ANH Academy.
- Rolando Gonzales Martinez presented our work at the UNICEF conference "Children's Lives: International Conference on Children and their Families, Using the Multiple Indicator Cluster Surveys", in collaboration with the Bristol Poverty Institute. The conference took place on September 2nd and 3rd, 2024, at the University of Bristol, United Kingdom.
- Dr. Rolando Gonzales Martinez presented our research at the 1st Regional ISQOLS conference in South Africa, on 3-5 October 2024. The International Society for Quality-of-Life Studies (ISQOLS) aims to promote research on quality of life, well-being and happiness, as well as to provide evidence-based support for designing and implementing well-being policies.



PhDs:

- Satyam Raj Singh, International Institute for Population Studies (IIPS) India on "maternal capabilities for healthy child growth" - field visit for data collection in October 2024 (focus group discussions);
- Kenya Rodriguez Castello, Global Breastfeeding Practices, started as a PhD at the Population Research Centre, University of Groningen (1 Feb 2024 till 1 Feb 2028);

Publications:

Published:

Chakraborty, B., Darak, S., **Haisma, H.** (2024) Operationalising the capability approach for healthy child growth via a participatory method: an illustrative case in haor areas of Bangladesh. *Journal of Human Development and Capabilities*.
<https://doi.org/10.1080/19452829.2024.2330885>

Submitted:

- Multi-Dimensional Child Growth: Evidence and Models for Children in Ethiopia. Revisions after Review. PLOS ONE (PONE-D-23-11077R1)
- Which environmental, household and child-level variables can prevent stunting and promote child growth? A Bayesian approach with priors based on machine learning and deep learning. Under Review.
- MICG-AI: A multidimensional index of child growth based on digital phenotyping with Bayesian artificial intelligence. arXiv:2412.14720

Manuscripts in process:

- "Anthropometry and beyond" describing the conceptual reasoning behind multi-dimensional capabilities approach to child growth;
- Ensuring No Child is Left Behind: Inequalities in multidimensional child growth in Ethiopia, Vietnam, Peru, and India;
- Ensuring No Child is Left Behind: A Bayesian Approach to Identifying Multidimensional Vulnerability Among Children in Ethiopia, Vietnam, Peru, and India;

Other:

- Book proposal for Oxford University Press on applying the capabilities approach in health across the life course and at population level. One chapter will be on child health and development informed by the work of this project.

Please list any successes accomplished during this period (Aligned with proposed measures of success from original proposal, or include justification for modifications).

Our activities on implementation require a context-specific approach. In the past year, concrete actions have been taken toward a multidimensional approach in the youth health care system in the Netherlands. We have been able to address the issue of the disconnect in the digital portfolio of children with relevant stakeholders. This is only a first step towards improving the access to child monitoring data by health care professionals. At the same time, we are developing an app for parents to monitor the growth of their children in a multidimensional way. In the future, we expect to use the data collected by the app to develop a preventive health model based on digital phenotyping.

Please mention your plans for the coming year and how they have been adapted based on success to date (if appropriate).

This is the last annual report in the current term of the task force. For the 2025-2029 cycle, we will submit a new proposal. We aim to continue our work on implementation of the multidimensional approach, while shifting the focus towards the worst-off children even more and building on moral arguments that is offered by the capability approach and using AI for implementation research. The work by our master student (see this report) as well as a field visit to Vietnam (scheduled early this year) is/was to explore the direction of such a new proposal, which we will soon submit. We will present our work at a symposium at IUNS-ICN in Paris in August 2025.