



Karolinska Institutet study:

Leading Scientific Study Highlights Max Foundation's Achievements on Halving Child Undernutrition

Sin, M.P., Forsberg, B.C., Peterson, S.S., & Alfvén, T. (2024). Assessment of Childhood Stunting Prevalence over Time and Risk Factors of Stunting in the Healthy Village Programme Areas in Bangladesh. *Children*, 11, 650. <https://doi.org/10.3390/children11060650>

Karolinska's research validates Max Foundations' achievements in halving child undernutrition

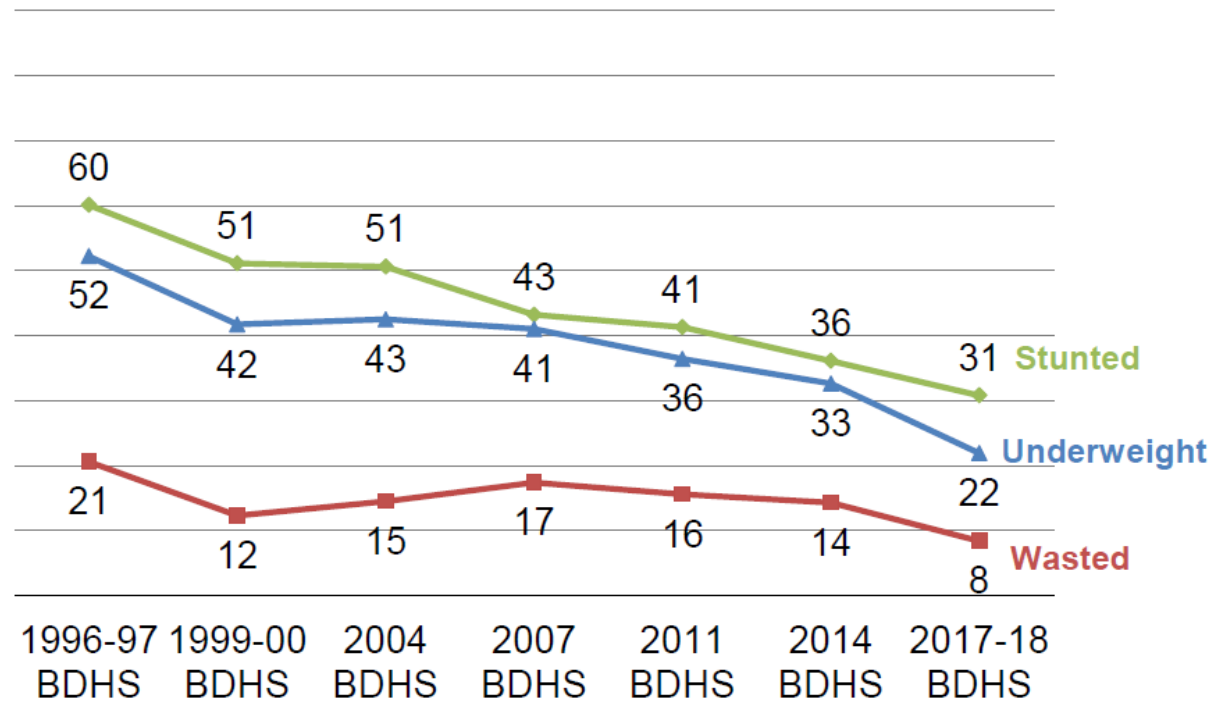
- The study uses child growth measurements that were taken as part of the Healthy Village approach in Bangladesh
 - Implemented between 2018 and 2021 by Max Foundation
 - It integrates water, sanitation & hygiene (WASH) with food security & nutrition interventions
 - A key measure of undernutrition is stunting, meaning a child is too short for their age
- Max wanted to better understand the impact the approach has, and how that impact is created to inform future programmes & scale-up
- The team of 4 researchers from Karolinska Institutet was engaged by Max to undertake the analysis
 - Karolinska Institutet is one of the world's leading medical universities and houses the Nobel Assembly that selects the Nobel laureate in Physiology or Medicine
- The study was published & featured in the journal Children, meaning it has the potential for high impact and provides an important outlook for future research directions

Undernutrition remains a major health problem in Bangladesh

Undernutrition can:

- Affect physical growth
- Increase proneness to infectious diseases
- Increase the risk of morbidity and mortality
- Affect mental development
- Impact learning
- Limit socioeconomic potential

Percentage of children under age 5 who are malnourished



The aim of the study is to assess childhood stunting prevalence over time and explore the risk factors in the programme areas

The international Karolinska Institutet validates Max Foundation's programme success on improving child undernutrition in Bangladesh. Data for the study came from two data sets:

Household Census

A 2018 household census collected information on household characteristics, the availability and accessibility of safe WASH facilities, household investment in WASH, and the household practice of monitoring under-five child growth.

The census covered the households in programme areas and the response rate was reported to be 99%.

n = 283,844

Anthropometric Measurements

Anthropometric measurements (height and weight) of children were taken quarterly from October 2018 to December 2021 in the programme areas.

n = 563,323

Result 1: halving undernutrition in children in just four years, much faster than the national trend

The stunting prevalence for children under 5 in the programme areas decreased from 51% in 2018 to 25% in 2021

Based on 132,038 height measurements

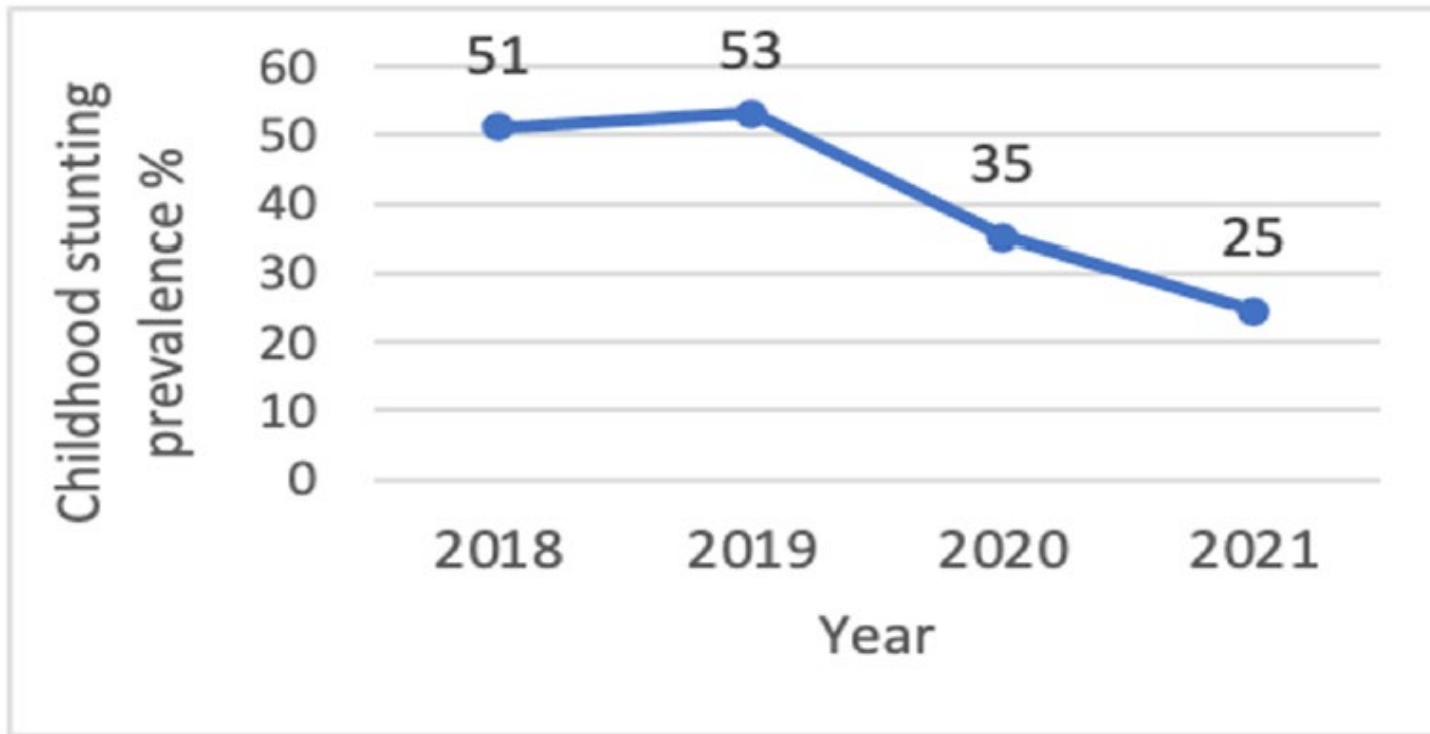


Figure 2. Point-prevalence of childhood stunting in programme areas in five districts of southern coastal Bangladesh from 2018 to 2021, Quarter 4 period (October–December) ($n = 132,038$).

Result 2: this was driven by both fewer children becoming stunted and more children escaping stunting

In the sub-group of under-five children who each were followed-up continuously for four years (n = 3,448):

- The percentage of healthy children who became stunted dropped from 25% in 2018-19 to 9% in 2020-21
- The percentage of children who escaped stunting increased from 11% to 19% over the same period

Table 1. Change in childhood stunting prevalence over time from 2018 to 2021 in programme areas in five districts of southern coastal Bangladesh.

Description	Percent (%) Change in Childhood Stunting Prevalence between Different Years					
	2018 and 2019 (n = 3448)	2018 and 2020 (n = 3448)	2018 and 2021 (n = 3448)	2019 and 2020 (n = 3448)	2019 and 2021 (n = 3448)	2020 and 2021 (n = 3448)
Normal to stunting	25%	15%	11%	9%	7%	9%
Stunting to normal	11%	31%	38%	39%	49%	19%
p value for McNemar †	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

† McNemar test to assess the changes in stunting prevalence between different years.



Result 3: many factors which affect stunting are (in)directly addressed by the Healthy Village approach

For the sub-group of children who were measured at baseline (n=20,174) a risk analysis shows the following factors *decrease* a child's risk of being stunted:*

Factors directly addressed by Healthy Village:

- Having access to growth monitoring
- Using an improved latrine
- Owning your own household latrine

Factors indirectly addressed:

- The child's mother having a higher level of education
- The household having higher socio-economic status
- Having only one child under 5 in the household

Non-modifiable factors:

- Child age and sex

Integrated approaches which tackle multiple root causes of stunting simultaneously are needed for impact

- Childhood stunting is a complex issue with multiple risk factors
- The results of the Healthy Village approach seem to be driven by its integration, targeting community knowledge & awareness, improving access to growth monitoring and increased access to healthy products simultaneously
- Entrepreneurship helps to improve access to healthy products, but also helps improve socioeconomic conditions in the long run
- As socioeconomic inequalities also relate to education level, usage of improved WASH and other health factors, it is crucial to tackle socioeconomic inequalities when addressing stunting