School Milk Initiative

Impact of adding milk to a micronutrient fortified school feeding program: An effectiveness trial in humanitarian settings

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on behalf of Aulo Gelli, Dalia El Sabbagh, Monica George Michail, and the School Milk Initiative Trial Group

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Rationale

- In 2022, **half a billion children** under 18 years of age lived in conflict-affected zones
- Children are particularly vulnerable to conflict
  - Impacts mortality, morbidity, and malnutrition in the short- and long-term in addition to weakening food and health systems, markets, and institutions (Altare et al., 2013; Justino, 2012)
- **Malnutrition** during school age and adolescence has **long-term consequences** for this and future generations (Norris et al., 2022)

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School feeding programs

- School feeding is a widely implemented multi-sectoral intervention with impacts across education, health and nutrition
- Globally, programs reach ~400 million children for a total investment of ~$50 billion a year (WFP, 2022)
- School feeding has an important role in humanitarian emergencies, including conflict, natural disasters, and economic crises
  - Improve children's nutrition, health, and education… **and** also improve child safety, protect against risks and disruptions, provide a sense of normalcy, and improve household food security and resilience
- However, there is rigorous limited data on the costs and effectiveness of school feeding in humanitarian crises

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Country context

- Approximately half of the population is food insecure, due to ongoing conflict, associated long-lasting economic decline, and high food and fuel prices
- Malnutrition is also prevalent in school-aged children, with 16% of boys and 11% of girls underweight, and 22% of boys and 23% of girls overweight.
- In 2022, 17% of school children received school meals
  - WFP provided imported fortified snacks (date bars or high-energy biscuits) to 1.55 million school children

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Formative research

- Date bars and high-energy biscuits (HEBs) are highly cost-efficient in terms of nutrient delivery
- However, there are issues around palatability. Biscuits are hard and difficult to swallow
- Caregiver and children want a beverage (juice, milk, water)
- Long-term desire for hot meals, prepared at school using locally sourced ingredients
- Considered hybrid scenarios to assess potential modifications

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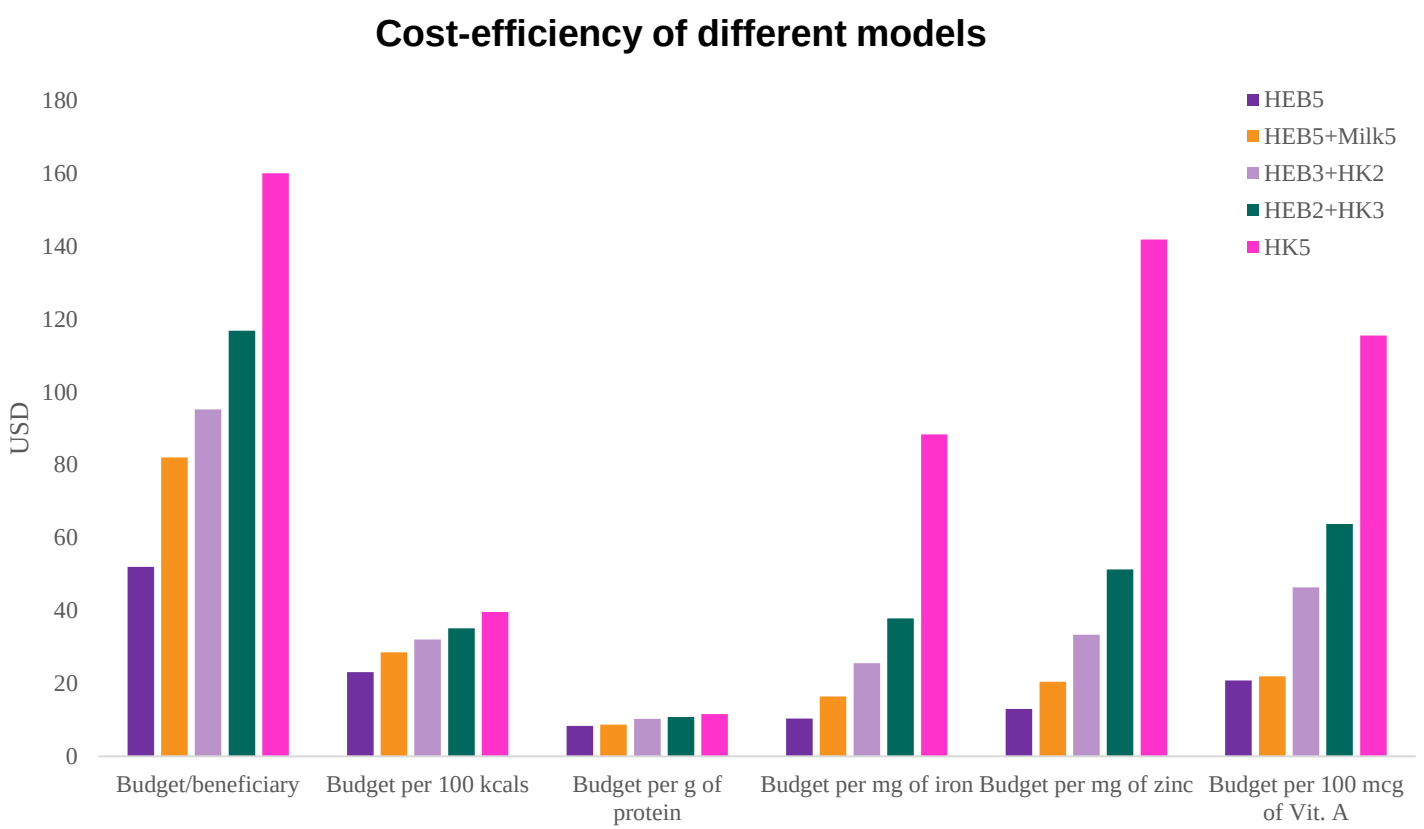
Source: Bliznashka et al., 2024.

Formative research



- Cost-efficiency ratios for HEB+Milk5 relative to HEB only ranged from 1.05 (for protein delivery) to 1.58 (for iron delivery)
- Cost-efficiency ratios for other scenarios from 1.24 to 10.91
- **HEB+Milk5 provides a "middle-option" that improves quality of the meal as program transitions towards healthy meals**
- It is acceptable and feasible

Source: Bliznashka et al., 2024.

Impact evaluation of the School Milk Initiative

- Cluster randomized controlled trial aimed at evaluating cost, cost-efficiency and impact of adding a daily drink of milk to ongoing fortified biscuit school feeding program
- 42 schools in Al Mukha district were randomized to either control or milk group
  - Control: 100 grams (2 packets) of HEB per day
  - Milk: 100 grams of HEB + 120 ml of UHT milk

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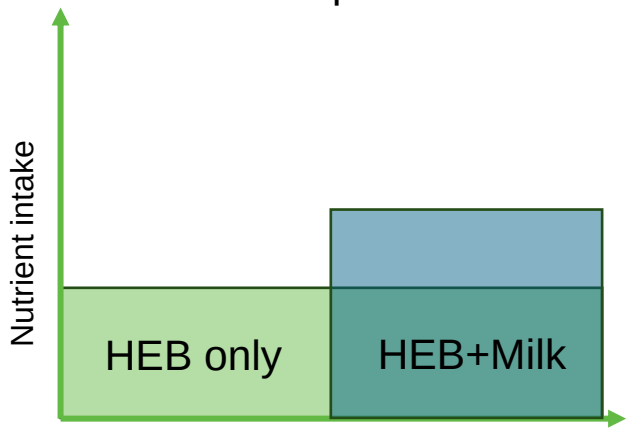
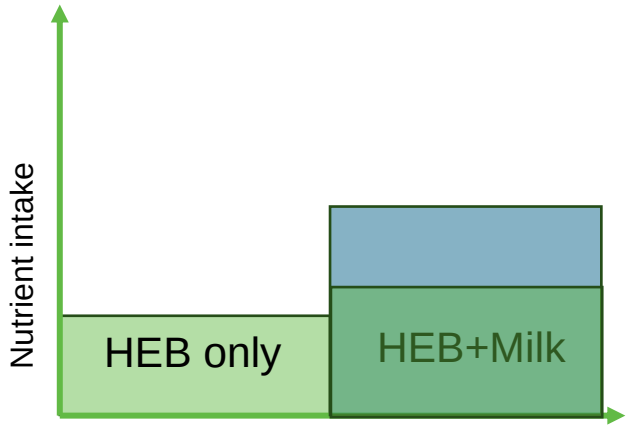
Pathways of impact: biological

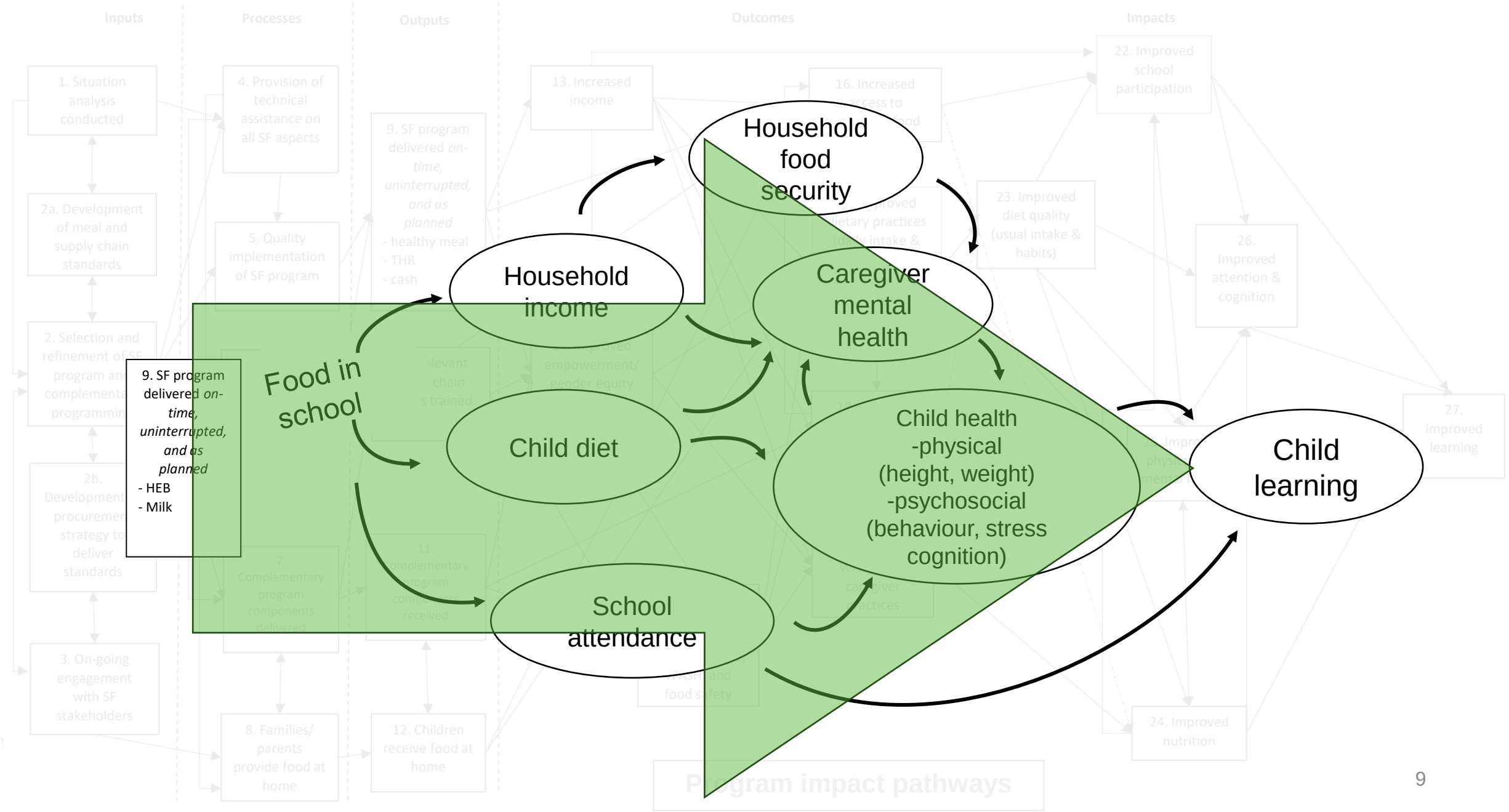
Optimal HEB consumption -some evidence this is not the case in practice…



Without milk, HEB consumption is sub-optimal in HEB only group



Pathways of impact: behavioural



Study design

- Primary reference group is primary school aged children enrolled in schools supported by the school feeding program
  - Secondary reference group includes their caregivers
- Data collection undertaken by Interaction Consulting using Computer Assisted Personal Interviews (CAPI) using Android tablets
  - Baseline survey: Dec 7, 2023 to Jan 17, 2024
  - Endline survey: Apr 28, 2024 to May 20, 2024
- Intention-to-treat analysis using linear mixed effects models accounting for the cluster design

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Results

Study participants

- 1,299 children enrolled at baseline: 640 in the control group and 659 in the intervention group
- 1,285 children surveyed at endline (99% of the sample)
- On average, 9 years of age at baseline
- ~50% boys and ~50% girls

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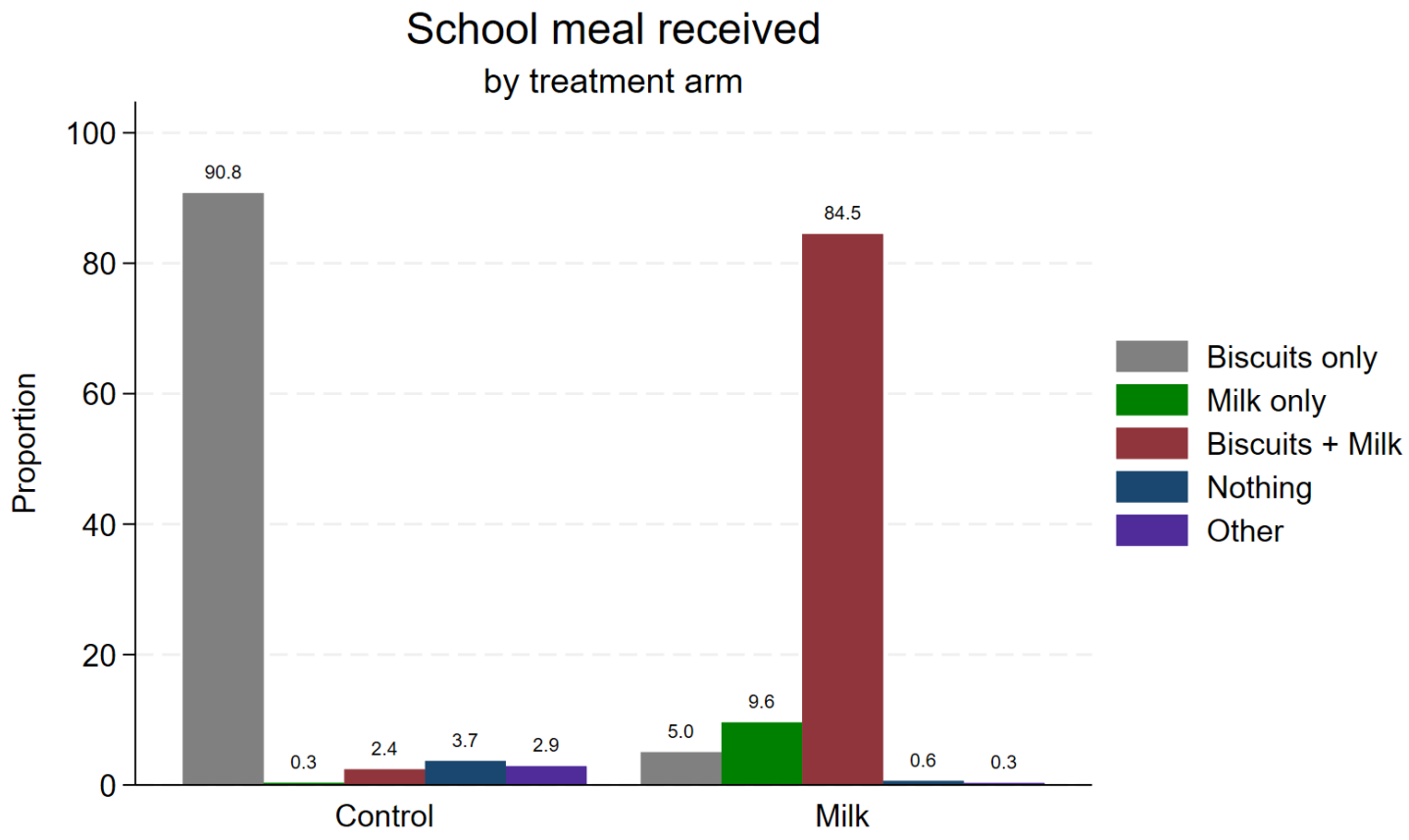
Pathways of impact: behavioural

Results: Program exposure



Results: Treatment effect estimates

- Visualise using:
  - Plots of changes in treatment and control group between baseline and endline

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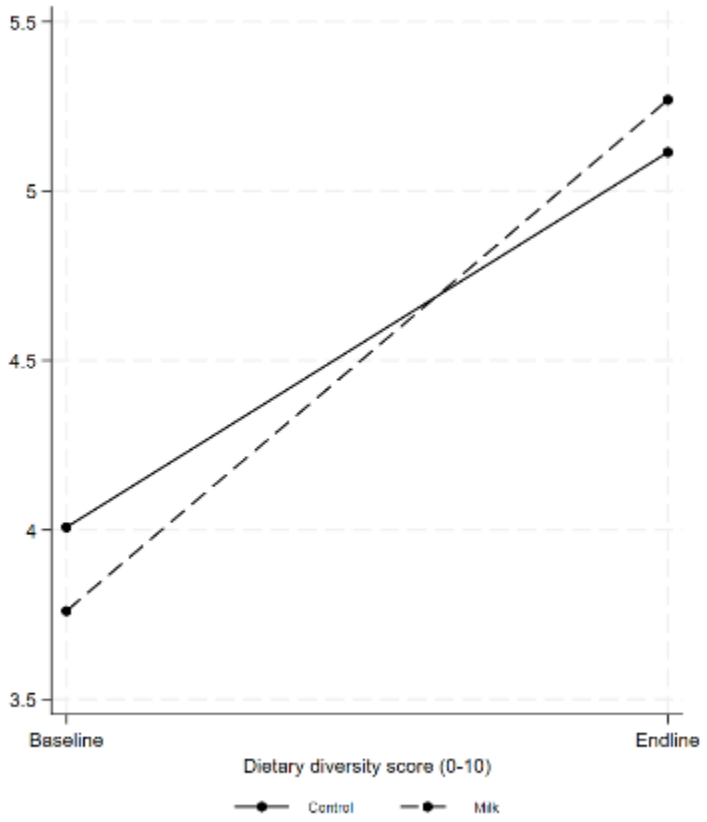
Results: Treatment effect estimates

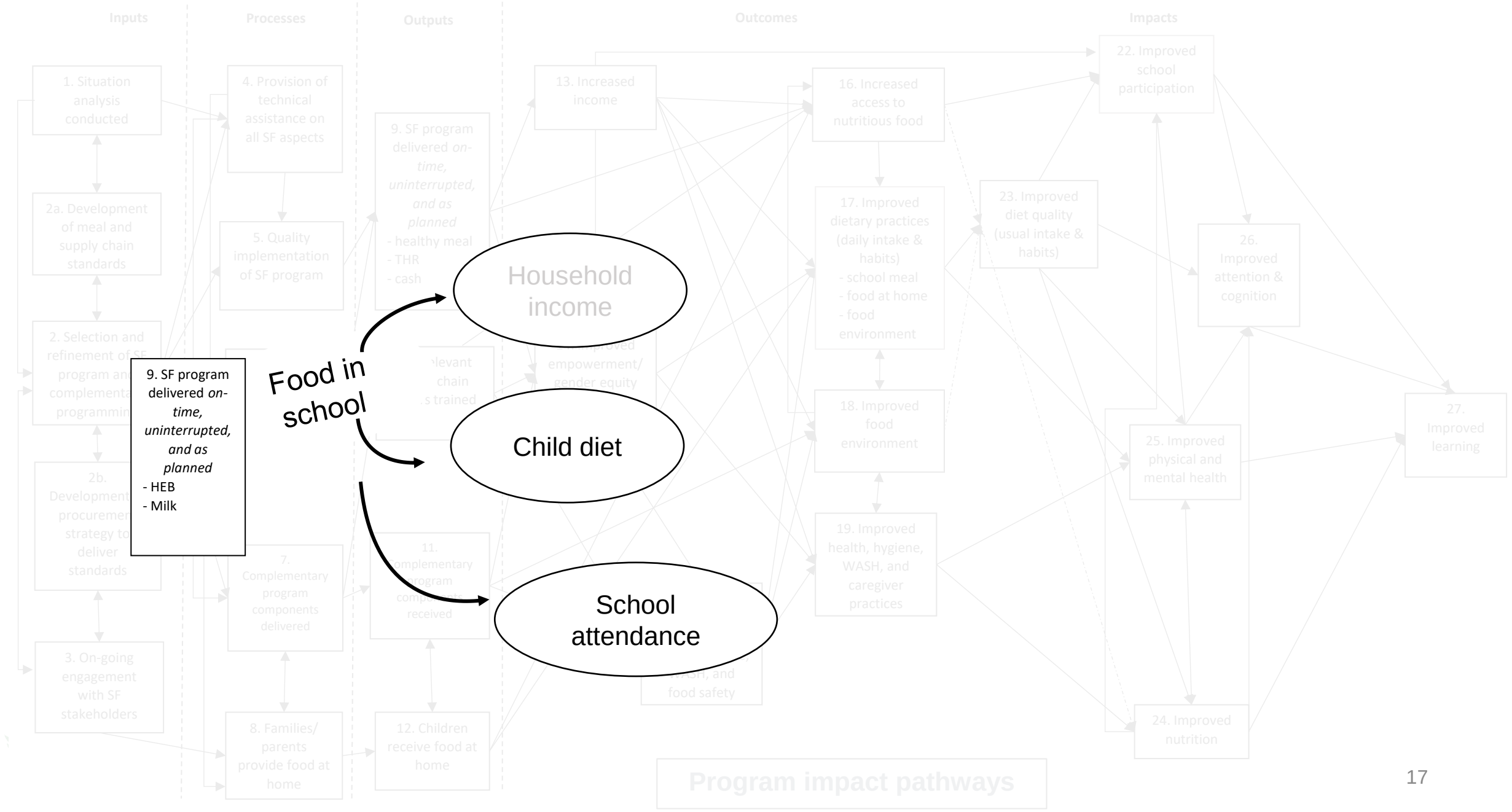
Use y-axis scale as a reference, in these slides this will vary by indicator considered



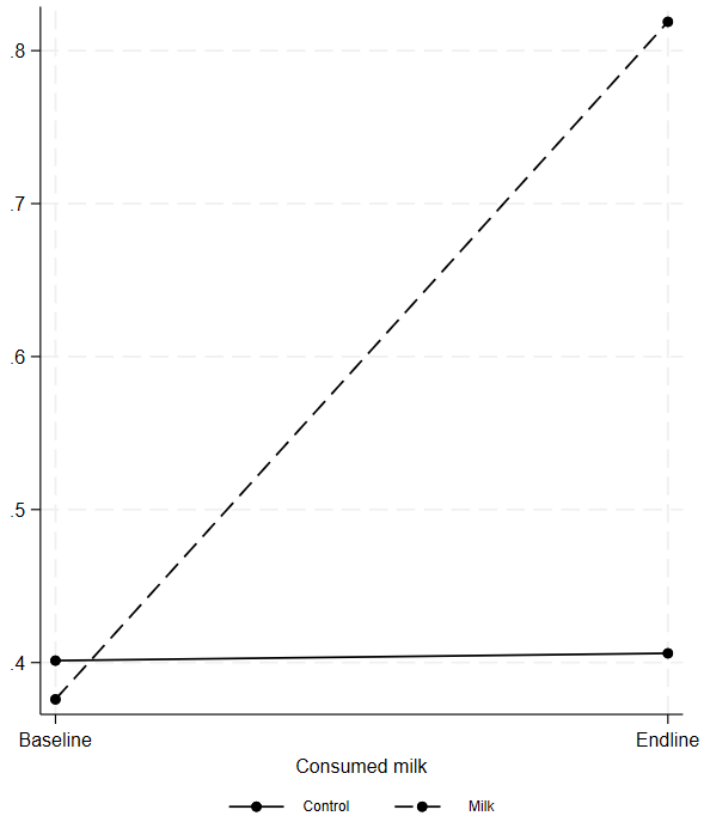
Lines represent the two treatment groups: dashed for Milk and solid for Control

x-axis represents time (baseline and endline surveys), it is the same for all indicators

Pathways of impact: behavioural

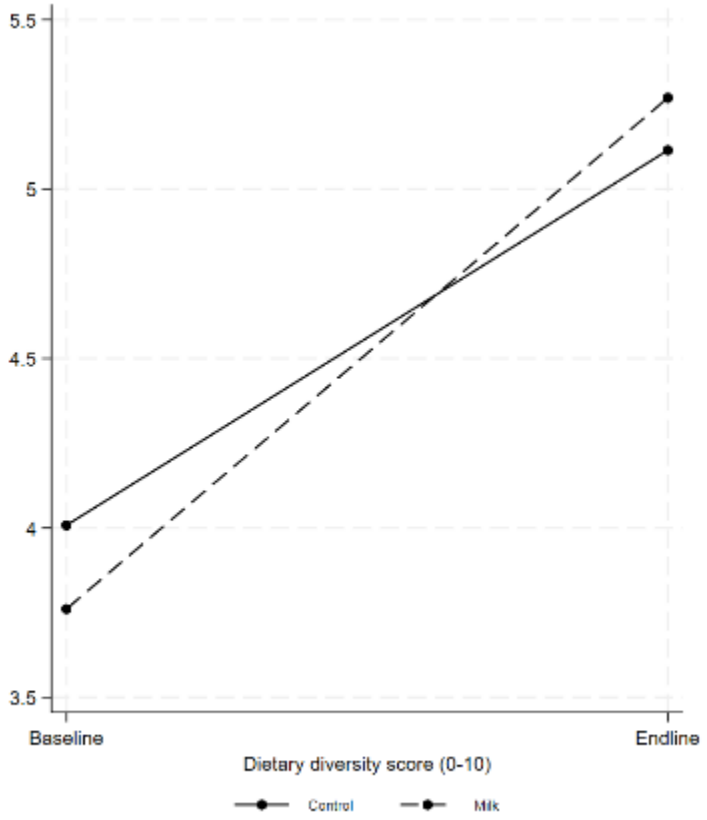


Results: Consumption of nutritious foods (milk)



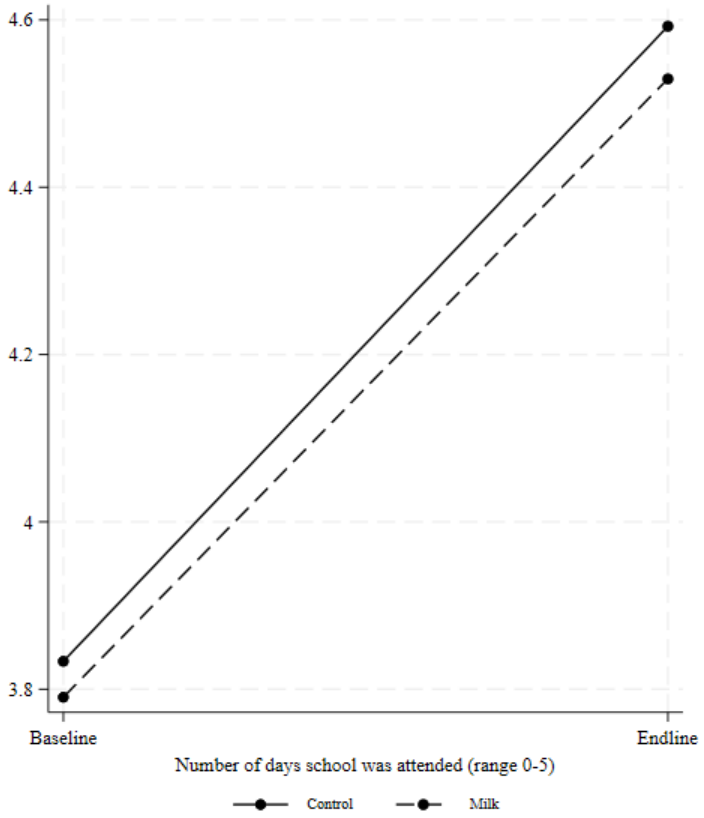
58% more likely to consume milk

Results: Children's dietary diversity



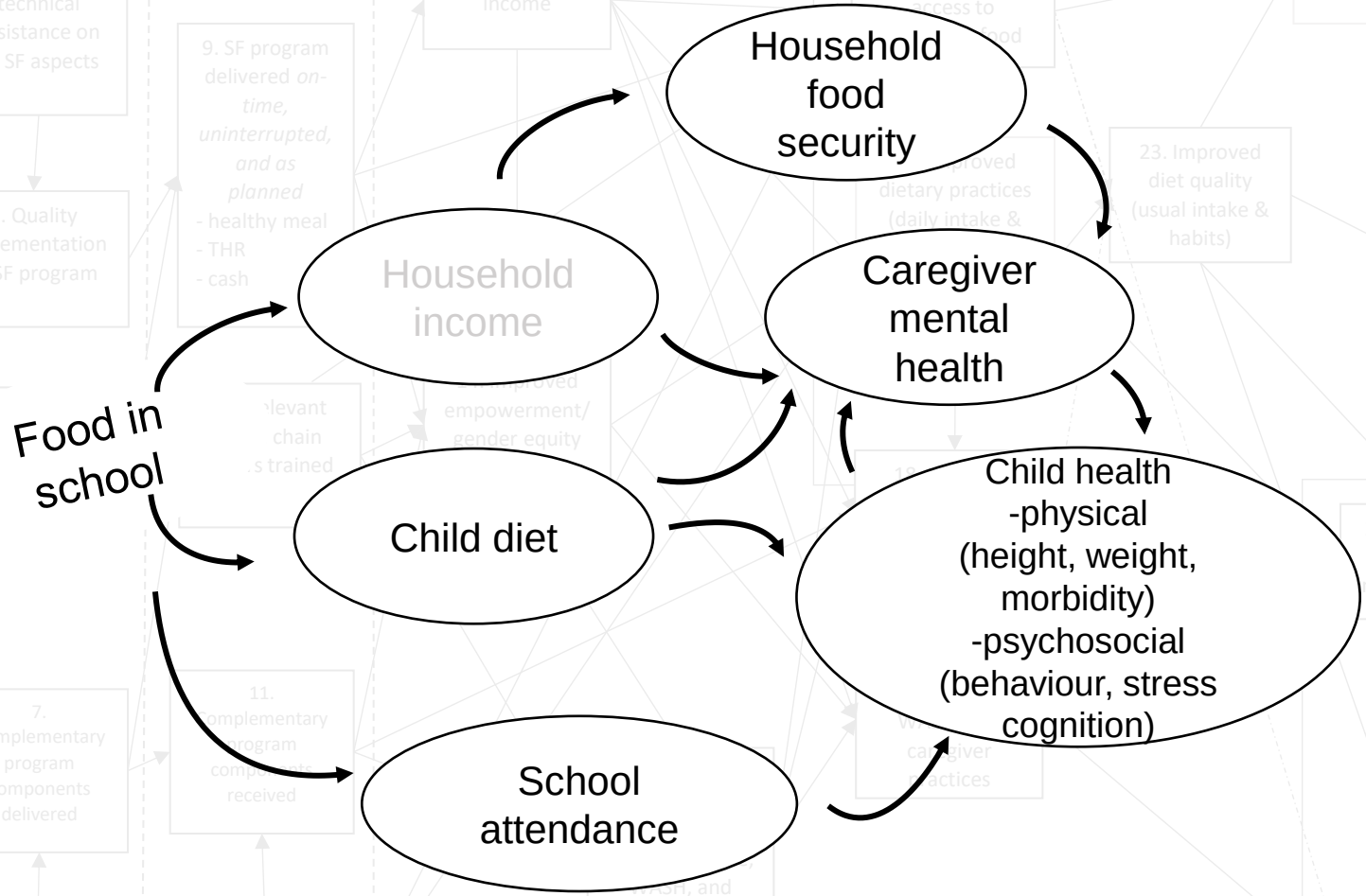
No difference in dietary diversity score

Results: School attendance



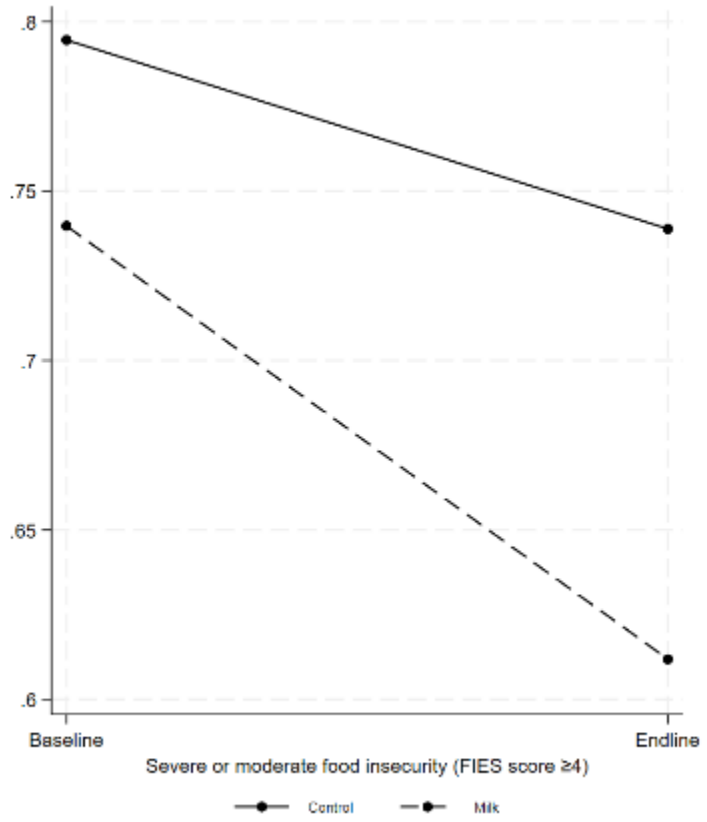
No difference in attendance

Pathways of impact: behavioural



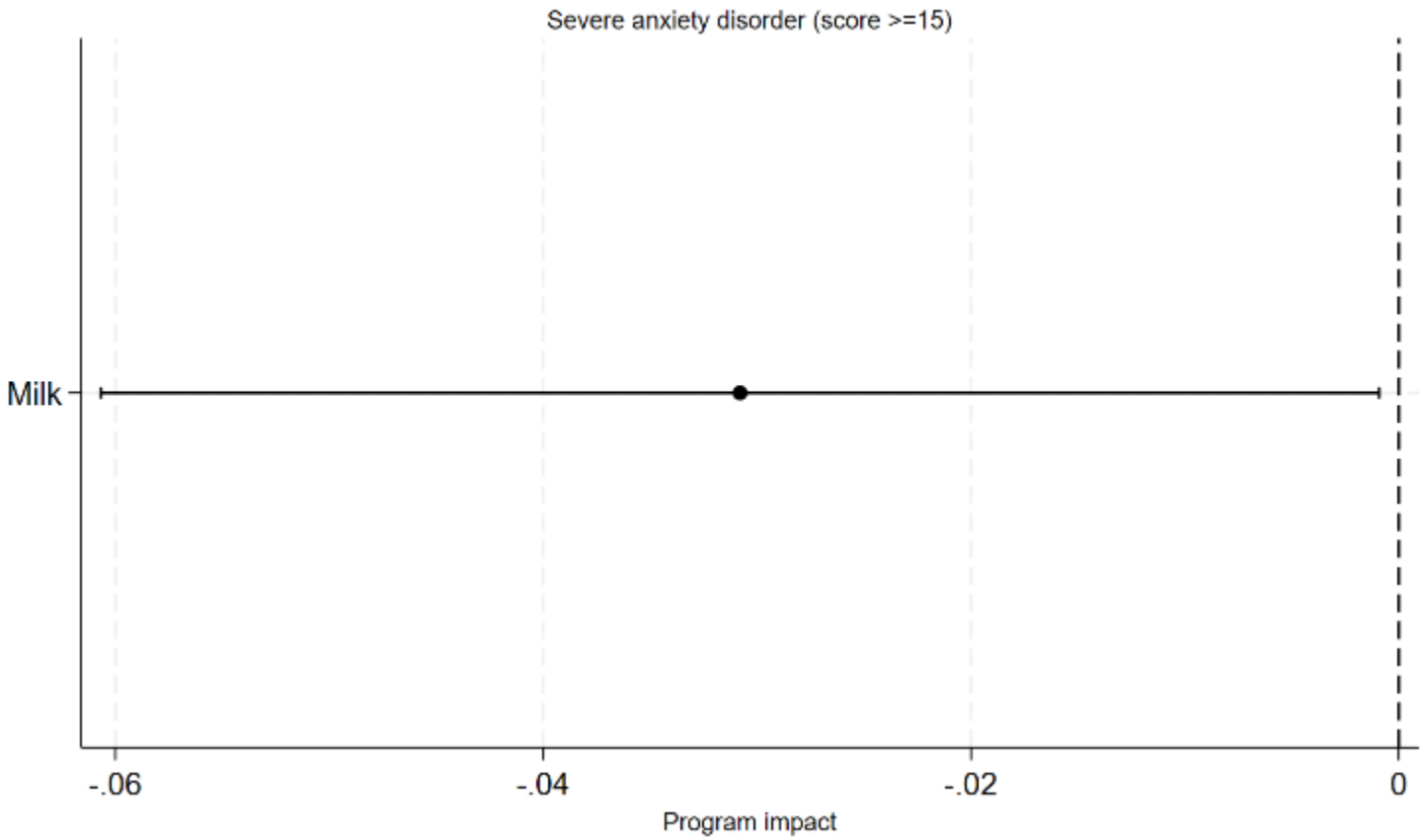
9. SF program delivered *on-time, uninterrupted, and as planned*
- HEB
- Milk

Results: Household food security



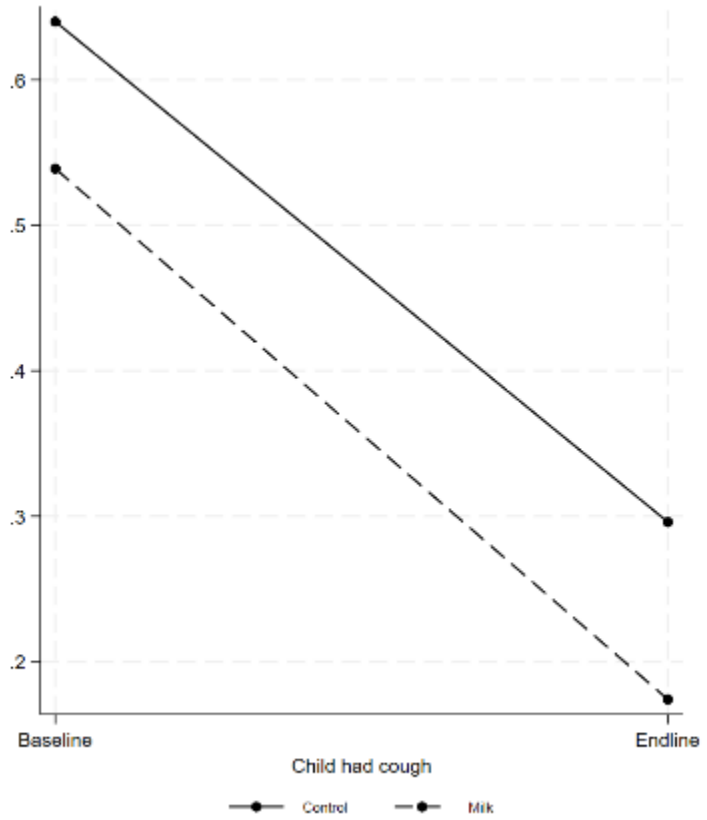
14% less likely to experience severe or moderate food insecurity

Results: Caregiver mental health



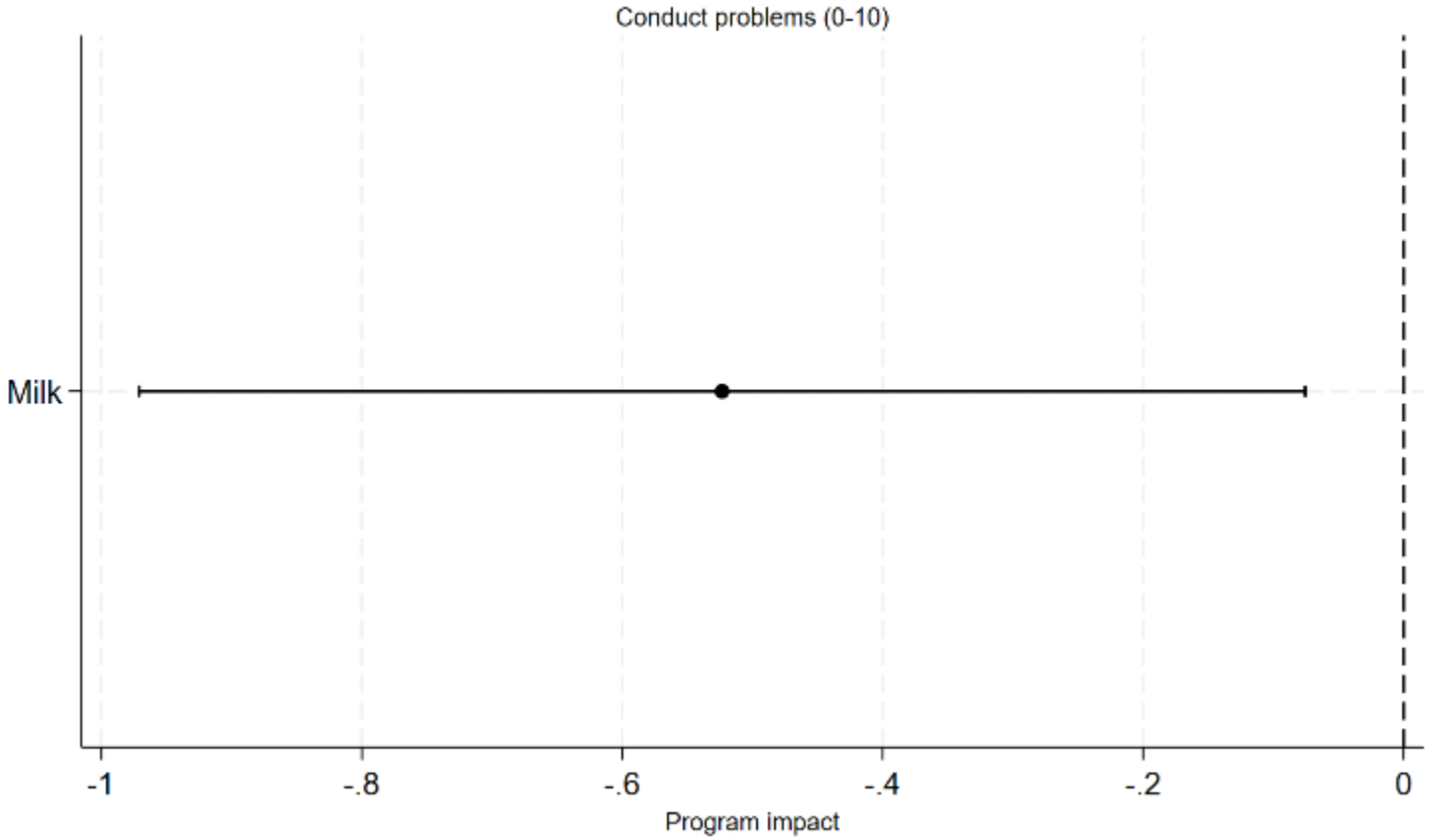
1% less likely to experience severe anxiety disorder

Results: Child morbidity



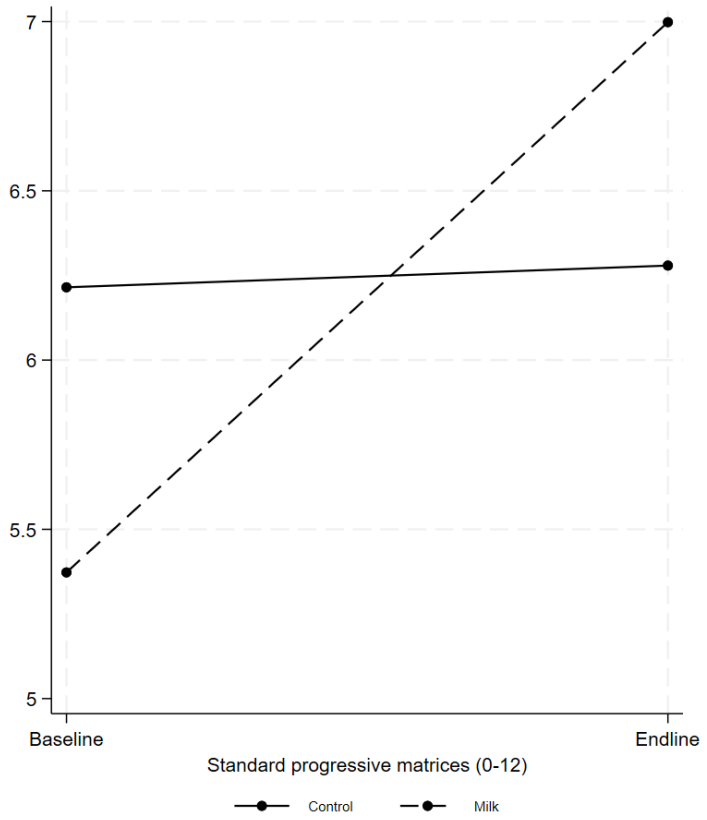
20% less likely to have had cough

Results: Children's behaviours (SDQ)



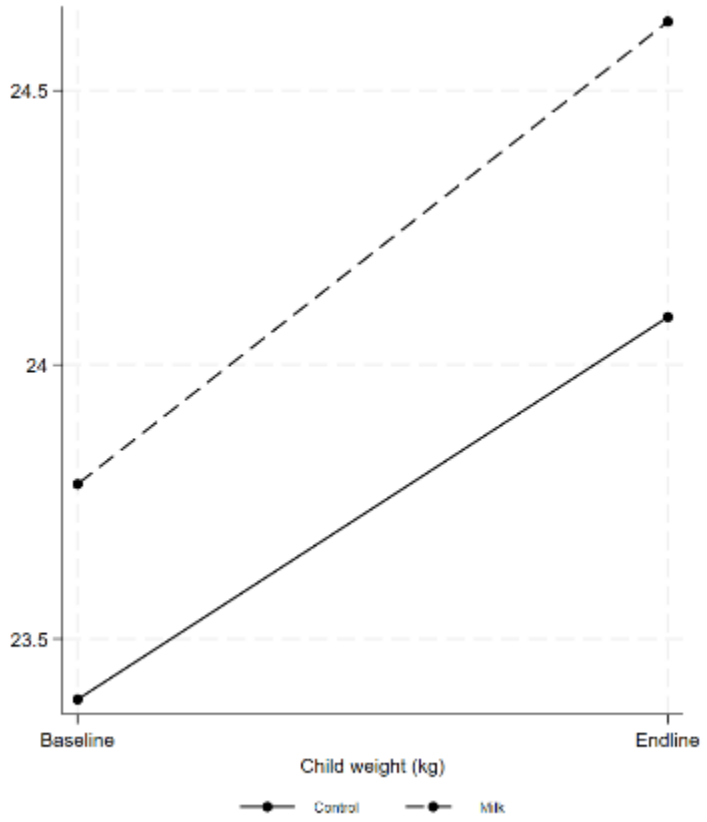
32% less likely to show conduct problems

Results: Children's cognition



17% higher cognition score

Results: Children's nutritional status



No difference in nutritional status

Key takeaways

- High-levels of school milk uptake
- Increased likelihood of consuming milk during day prior to the survey
- No impact on dietary diversity or school attendance

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Key takeaways

- Improvements in food insecurity
- Positive effects on the prevalence of caregiver severe anxiety, particularly caregivers of girls and those in the least wealthy households
- Reductions in some self-reported morbidity symptoms, with larger reductions among wealthier households
- Reductions in child problematic behaviours, with evidence of larger effects among older children
- Moderate positive effect on some aspects of cognition with larger increases among younger children and girls
- No significant effects on nutritional status, likely due to short study duration

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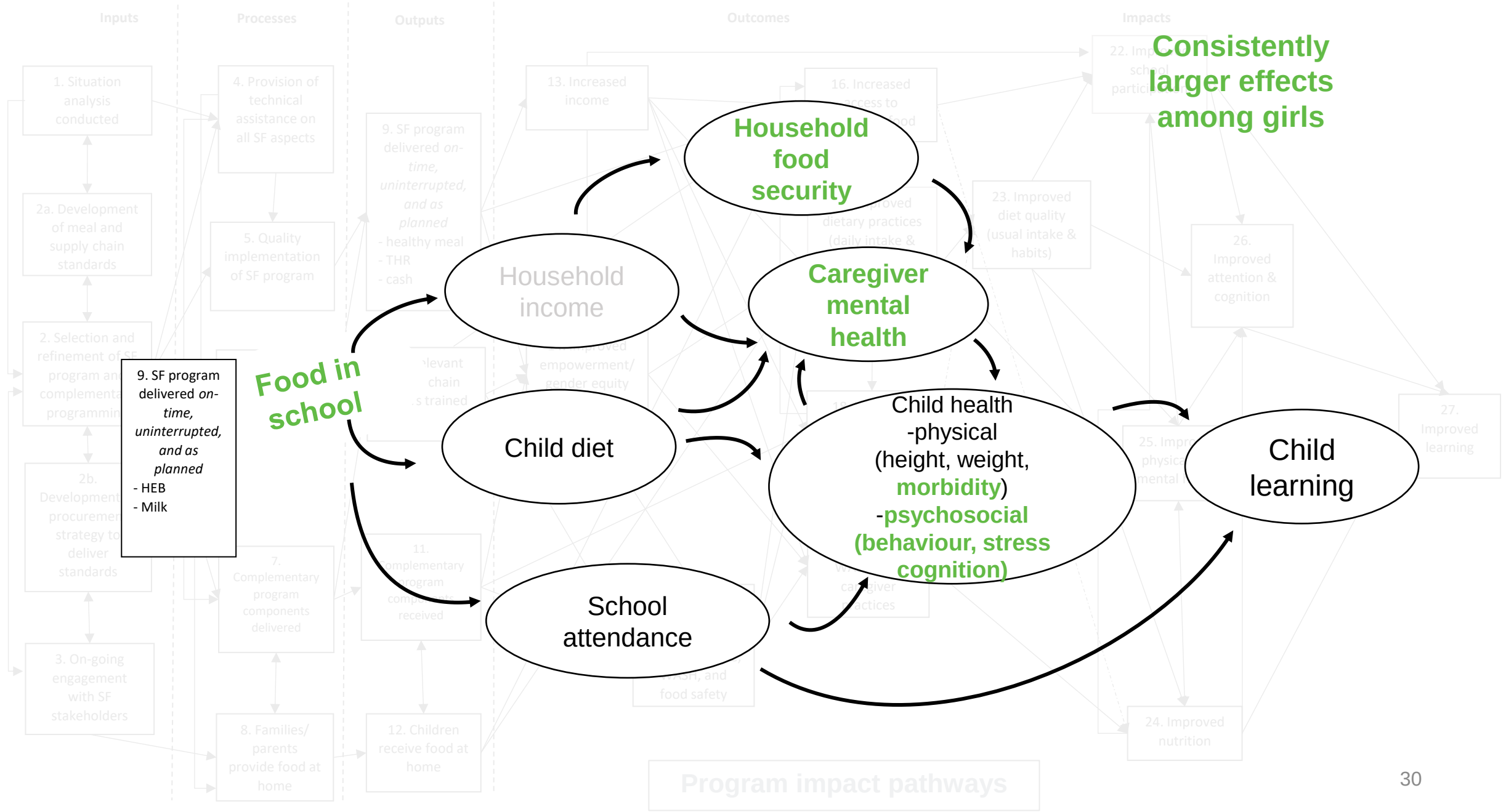
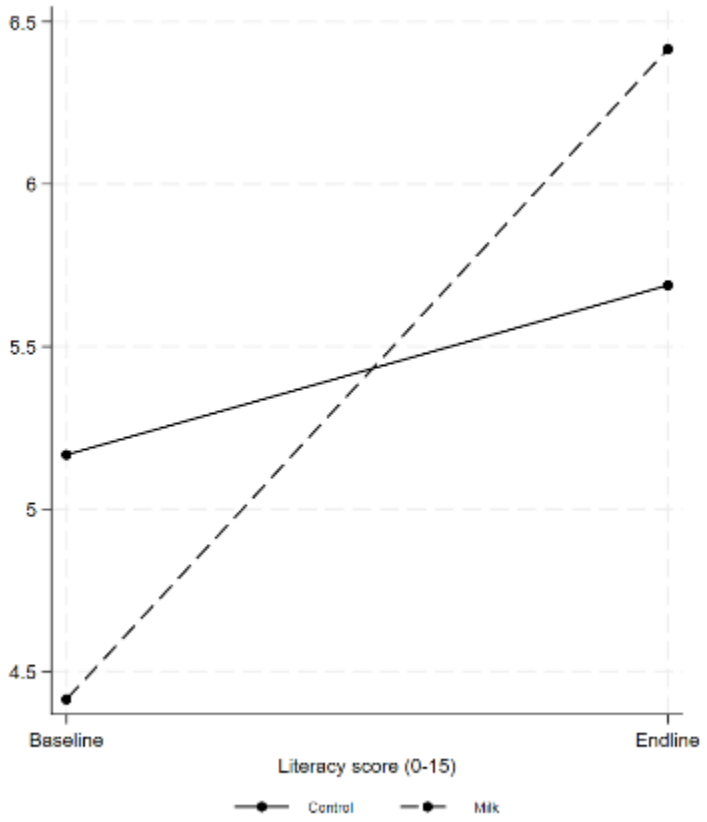
Pathways of impact: behavioural

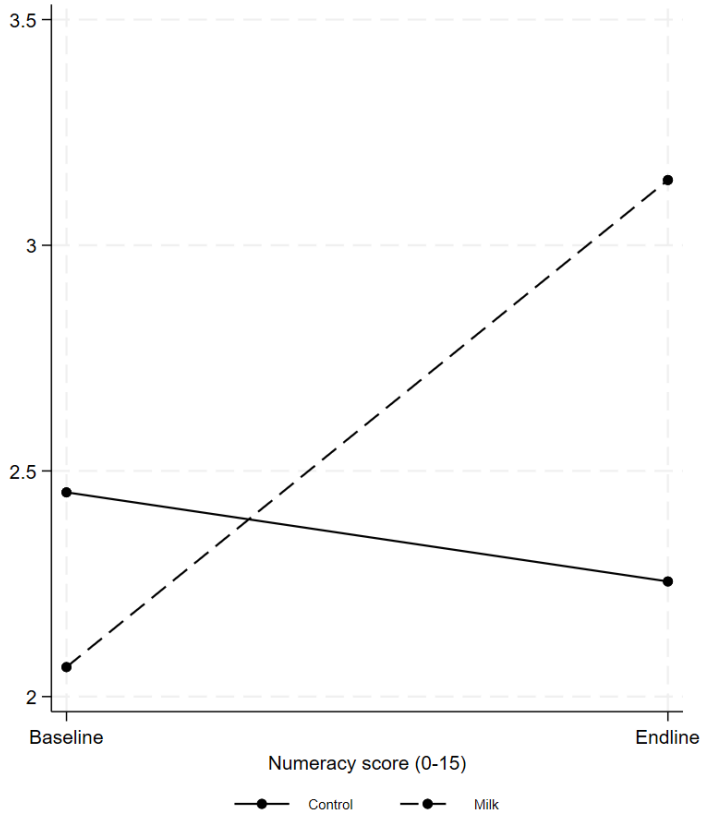


Results: Children's learning



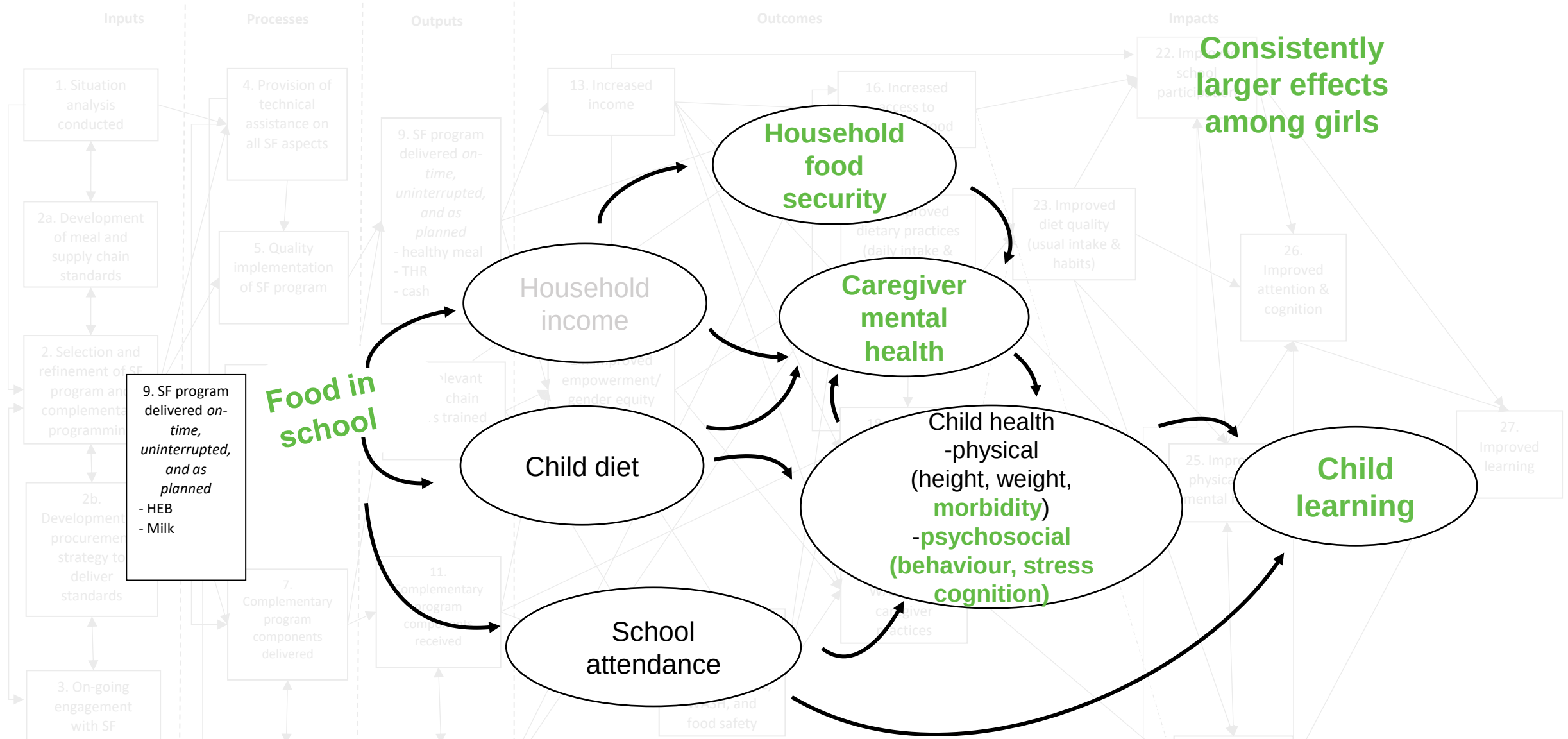
24% higher literacy scores

Results: Children's learning



47% higher maths scores

Pathways of impact: behavioural



Discussion

Discussion

- Rigorous evidence presented in this study suggests that **short-term** (~5 mo) **school milk provision** alongside fortified HEB **had important benefits for children and their families** in Yemen
  - **Results** largely **consistent with evidence on benefits of school feeding** in the literature… plus **new results** on **mental health** during conflict
  - Results on cognition also consistent with another trial on school milk in Ghana (Lee et al. 2020)
  - Remarkable result, considering short-time frame of the study and context in which intervention was implemented
  - Highlights **key role of school feeding during humanitarian crises**
  - Milk intervention likely worked through both **biological** and **behavioural** pathways

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Discussion

- Strengths of study include cRCT design and use of combination of subjective and assessment-based indicators
- Limitations include small scale pilot concentrated in Al Mukha district, findings may not generalize
- In conclusion, **hybrid models are acceptable, feasible, and lead to meaningful benefits for vulnerable populations** (children and their caregivers)
  - Opportunities for scale up?
- **Important gaps remain on costs**, on medium- and long-term benefits of intervention and on localizing supply chain

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- IFPRI consultants: Monica George Michail, Dalia Elsabbagh, and in-country colleagues
- Implementation team: WFP, HSA, HDB, Tetrapak
- Data collection team and respondents

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Thank you!