

How cost-effective are interventions to improve early childhood nutrition and development?

An update of a 2014 review

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Background

Early childhood nutrition and development (ECND) programmes are among the most powerful investments for improving population health, human capital, and long-term economic productivity. A 2014 systematic review identified 15 economic evaluations, mostly from high-income settings and with substantial methodological heterogeneity. Over the past decade, the ECND landscape has expanded dramatically, yet no comprehensive update has assessed how the economic evidence base has evolved or how cost-effectiveness has changed.

Aims

1. Update the 2014 systematic review of economic evaluations of ECND interventions.
2. Harmonise and attempt comparison of cost-effectiveness results and benchmark ICERs against country-specific GDP per capita and thresholds.
3. Assess methodological quality, reporting practices, and persistent evidence gaps.
4. Identify trends in intervention types, geographic distribution, and economic value.

Methods

Search strategy: MEDLINE, Embase, Web of Science (2014–2025), inclusion of full economic evaluations (CEA, CUA, CBA, costing studies)

Eligibility: Interventions delivered during the first 5 years of life, peer-reviewed, English language

Extraction: Study characteristics, perspective, time horizon, cost components, price year, ICERs, outcome metrics, uncertainty analysis

Harmonisation: DALY-based ICERs inflated to 2024 USD using CPI-U and treated as 2024 Int\$ for cross-study comparability

Classification: DALY ICERs compared with cost-effectiveness thresholds

Synthesis: Descriptive analysis by intervention category, income level, and methodological characteristics

Results

Study characteristics

- 62 studies included (vs. 15 in 2014)
- Conducted across 32 countries, with 79% from LMICs

Intervention categories

- Nutrition/Feeding (36%)
- Integrated multi-domain programmes (31%)
- Parenting/Stimulation (12%)
- Breastfeeding/Lactation (17%)
- Obesity-prevention (4%)

Metric	% of papers
Perspective reported	90
Comparator described	97
Time horizon reported	81
Discounting applied	40
Any sensitivity analysis	39
Probabilistic sensitivity analysis	13

DALY-based ICERs (harmonised to 2024 Int\$):

- Range Int\$16.6 to 909 per DALY averted
- Median Int\$100 per DALY averted

GDP-based classification:

- 40% highly cost-effective
- 17% cost-effective
- 11% cost-saving
- Integrated and nutrition-related interventions were consistently among the most cost-effective

Persistent challenges

- Substantial outcome heterogeneity (natural units vs. DALYs)
- Limited use of societal perspectives (27%)
- Infrequent probabilistic modelling
- Poor reporting of price year and cost components in some studies.
- Minimal assessment of scalability, generalisability, or budget impact.

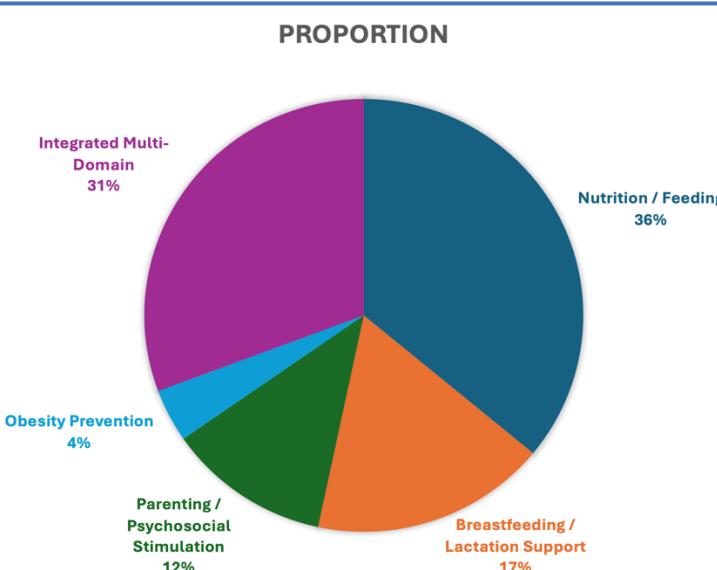


Figure 1. Proportion of main intervention groups in updated review

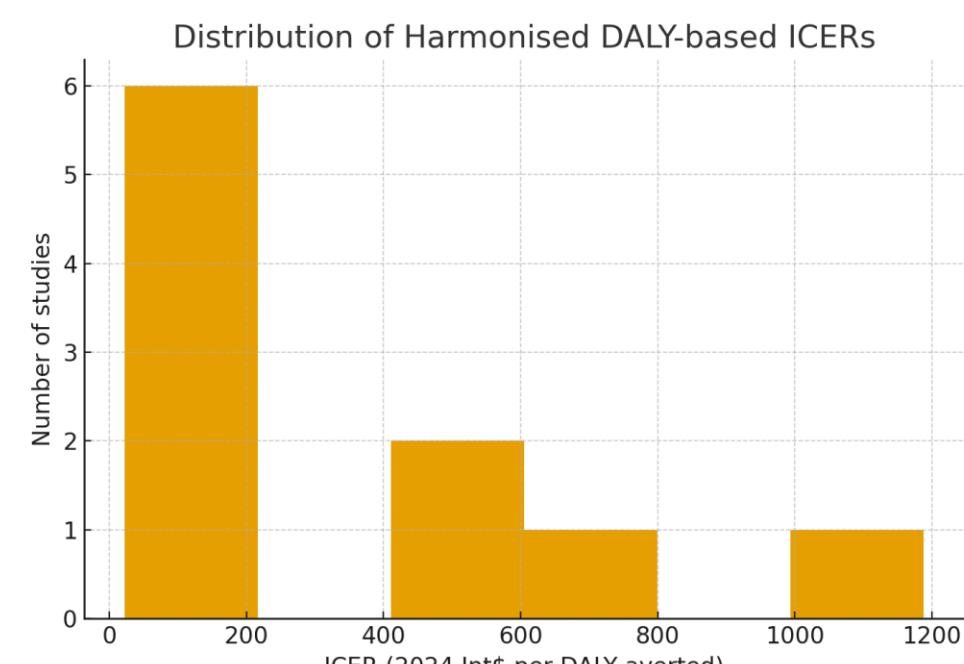


Figure 2. Distribution of harmonized DALY-based ICERS in updated review

Conclusion

A decade after the 2014 review, the economic evidence base for ECND interventions has grown substantially, with far more studies from LMICs and improved reporting quality. After harmonisation to 2024 Int\$, most DALY-based evaluations are highly cost-effective and several are cost-saving, confirming ECND as one of the most efficient public investments.

Persistent gaps remain, especially in outcome standardisation, uncertainty analysis, indirect cost inclusion, and scalability assessment.

Strengthening methodological consistency and adopting ECND-specific evaluation standards will enhance comparability and policy relevance.

ECND interventions remain among the highest-value investments for improving human development.

References:

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