

A Systematic Review and Meta-Analysis of the Impact of Early Childhood Development Interventions on Child Health Outcomes

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MOTIVATION

- ▶ SDG goals for child health targeted globally by 2030 ([United Nations, 2021](#))
 - ▶ **SDG 2:** Food security
 - ▶ **SDG 3:** Promote healthy lives
 - ▶ **SDG 6:** Sustainable water and sanitation
- ▶ Informing policy makers on which interventions have an impact achieving these goals
- ▶ Specifically for Lower and Middle Income Countries (LMIC) ([United Nations, 2020](#))

RESEARCH QUESTIONS

1. Which interventions have an impact improving child health?
2. What gaps in the literature remain untested?
3. What are the policy implications that can be made to achieve the SDG goals by 2030?

SEARCH STRATEGY

- ▶ Follow a standard PRISMA systematic review and meta-analysis method ([Page and Moher, 2017](#))
- ▶ Board search of both published manuscripts and grey literature
- ▶ Pulled articles from 21 search engines

SEARCH STRATEGY

- ▶ **Search Terms:** “early childhood development”, “early development”, “early child care”, “ecd”, “health”, “nutr*”, “mental health”, “therapy”, “special needs”, and “food”.
- ▶ **Outcomes of Interest:** Anemia, Height, Height for Age, Weight, Weight for Age, Worms Infection, Head & Upper Arm Circumference
- ▶ **Exclusion Criteria:** (1) not a developing country as of 1999, (2) subjects older than 8 years old, (3) publication or intervention prior to the year 2000, (4) another literature review or meta-analysis, (5) not written in English, (6) not an ECD intervention, (7) doesn't measure selected outcome measures, and (8) does not use the RCT method.

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SEARCH PROCESS

Stage	Article Count
Identified Articles	62,900
Duplicates	15,245
Accepted in Title Review	6,654
Accepted in Abstract Review	3,133
Accepted in Article Review	13
Snowball Article Additions	28
Included Articles	41

ARTICLE SELECTION

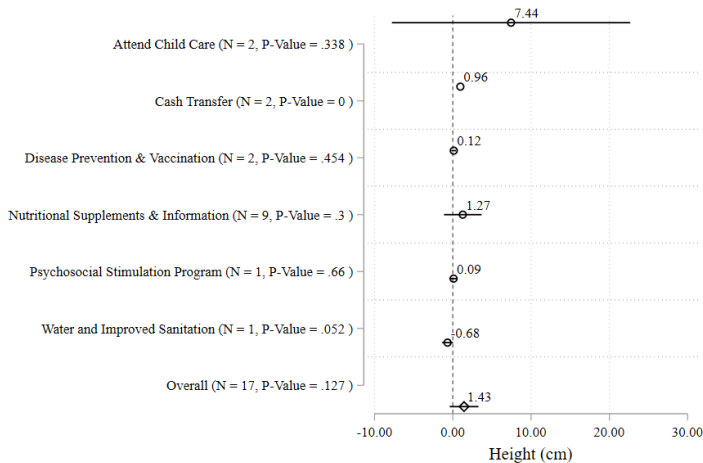
- ▶ 41 articles included
- ▶ 22 countries represented
- ▶ **Interventions identified:** (1) attend child care, (2) caregiver or parental education, (3) cash transfers, (4) disease prevention & vaccination, (5) nutritional supplements & information, (6) psycho-social stimulation programs, and (7) water and improved sanitation.

META ANALYSIS

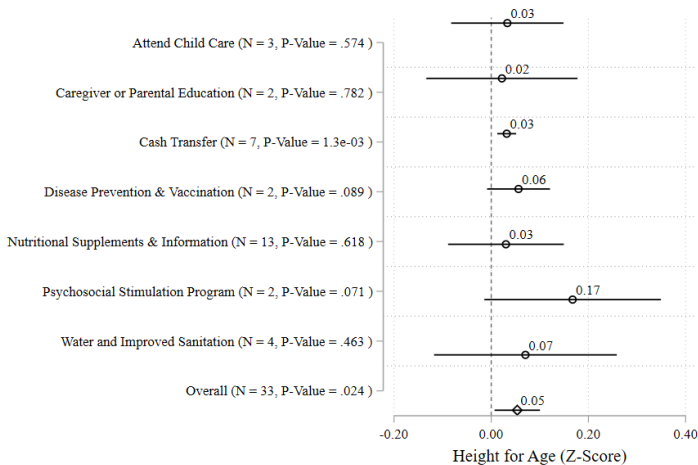
$$\theta_k = \theta + \beta\chi_k + \varepsilon_k + \zeta_k \quad (1)$$

- ▶ Random Effects Model
- ▶ k = Study (Unit of Obs.)
- ▶ θ = Meta estimate
- ▶ θ_k = Population parameter
- ▶ χ = Study level estimate
- ▶ ε = Idiosyncratic error term
- ▶ ζ = Covariate heterogeneity

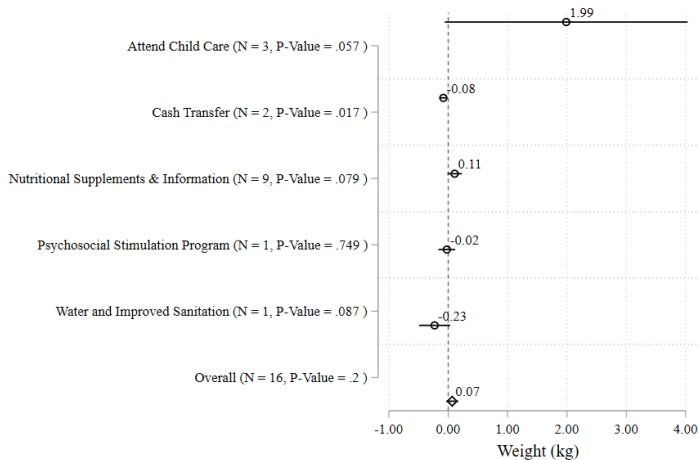
HEIGHT



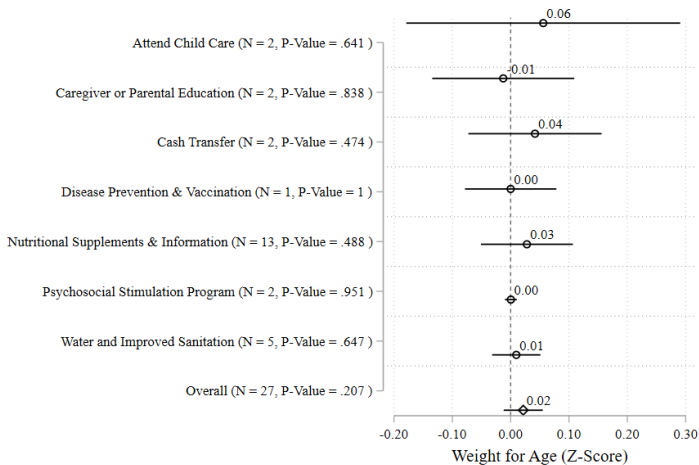
HEIGHT FOR AGE



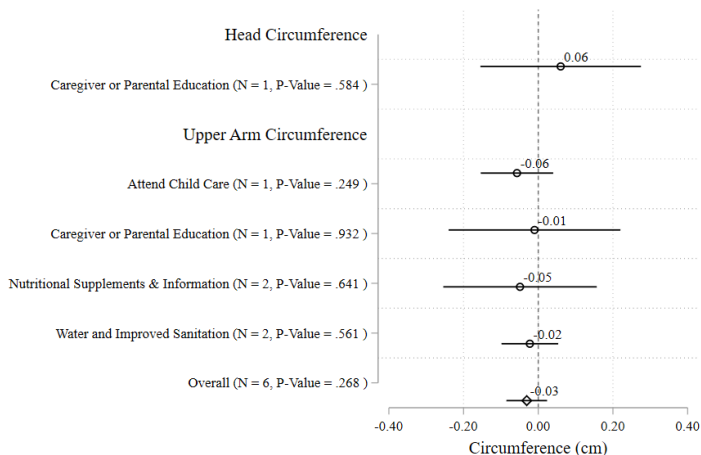
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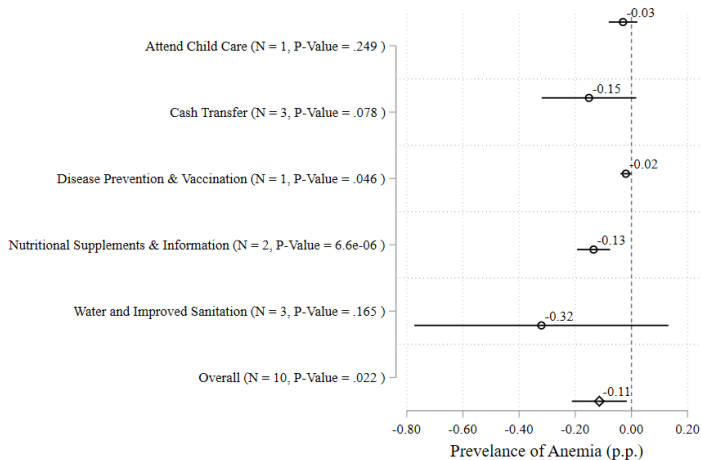
WEIGHT FOR AGE



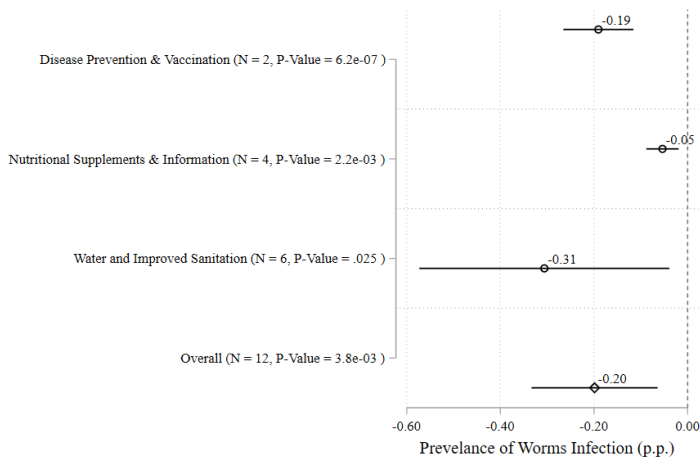
HEAD AND UPPER ARM CIRCUMFERENCE



ANEMIA



WORMS INFECTIONS



SUMMARY OF FINDINGS

	Height	Height for Age	Weight	Weight for Age	Head Circumference	Upper Arm Circumference	Anemia	Worms Infections
Child Care	Null	Null	Positive	Null	Untested	Null	Null	N/A
Caregiver Education	Untested	Null	Untested	Null	Null	Null	Negative	N/A
Cash Transfer	Positive	Positive	Negative	Null	Untested	Untested	Negative	Untested
Vaccination	Null	Positive	Untested	Null	Untested	Untested	Untested	Negative
Nutritional Supplements	Null	Null	Positive	Null	Untested	Null	Negative	Negative
Psychosocial Stimulation	Null	Positive	Null	Null	Untested	Untested	Untested	Untested
Water & Sanitation	Negative	Null	Negative	Null	Untested	Null	Null	Negative
Overall	Improvement	Improvement	No Effect	No Effect	No Effect	No Effect	Improvement	Improvement

DISCUSSION

1. Achievable:

- ▶ Increase Height
- ▶ Reduce Anemia
- ▶ Reduce Worms Infections

2. Need to Stride for:

- ▶ Increase Weight
- ▶ Increase Head and Upper Arm Circumference

3. Remains Untested:

- ▶ RCTs to increase Head and Upper Arm Circumference

4. Policymaker Takeaways:

- ▶ Lean on the interventions that are successful to scale

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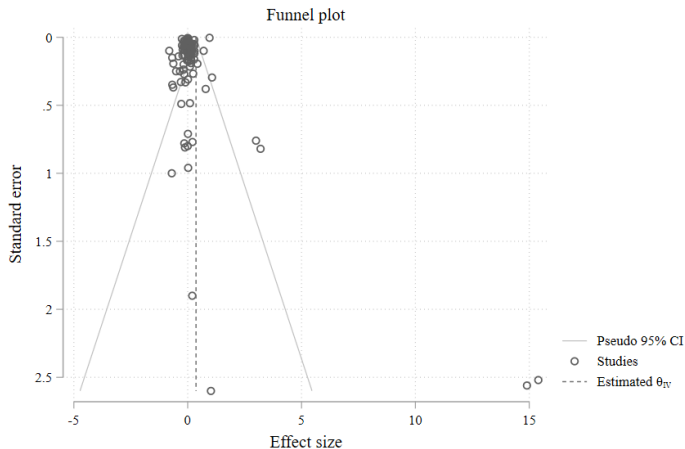
THE END

Thank You for Your Time!

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PUBLICATION BIAS



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