

# Socio-ecological Factors and the Double Burden of Malnutrition Among Children & Adolescents in Low- & Middle-Income Countries

## School Feeding Programs

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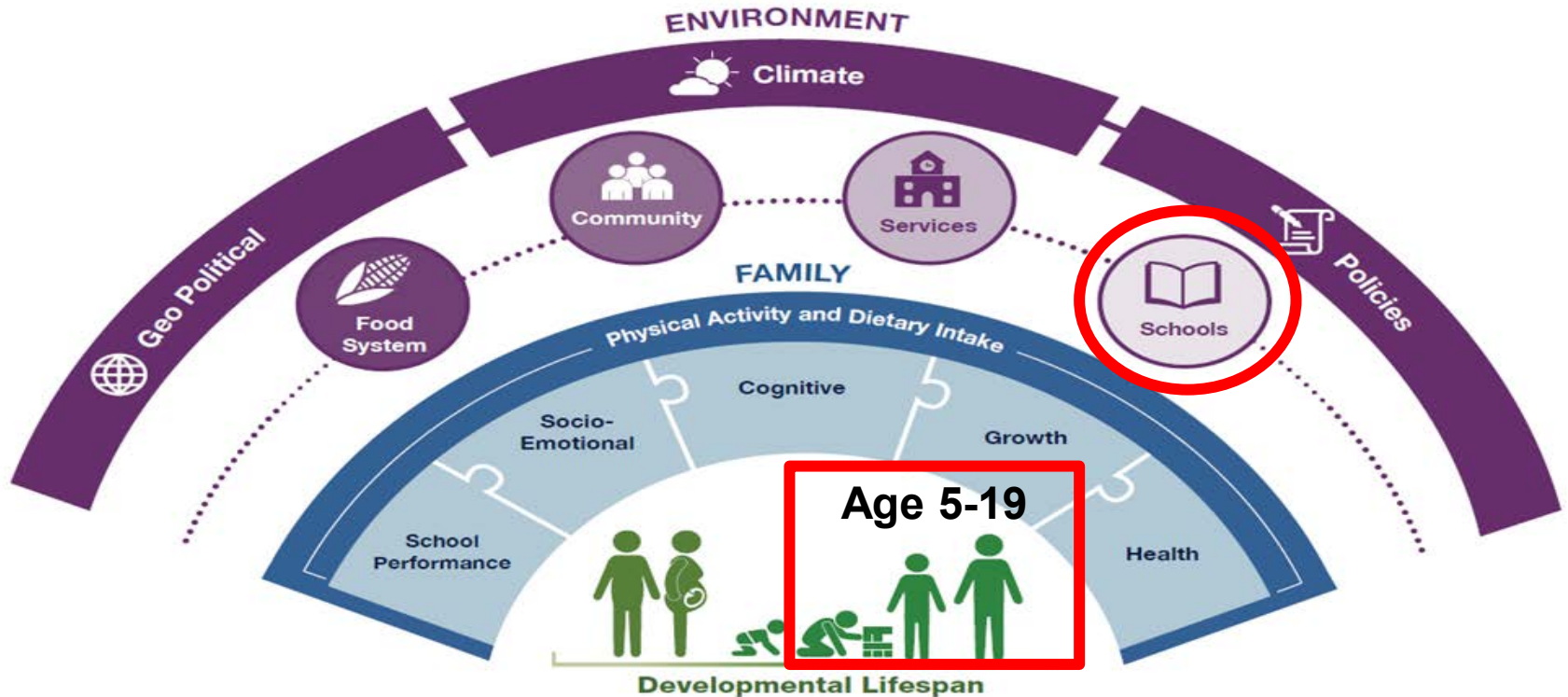


# Roadmap



- **Nutritional Ecology**
- **School Feeding – LMIC**
- **School Feeding – USA & other OECD Countries**
- **Research Gaps & Moving Forward**

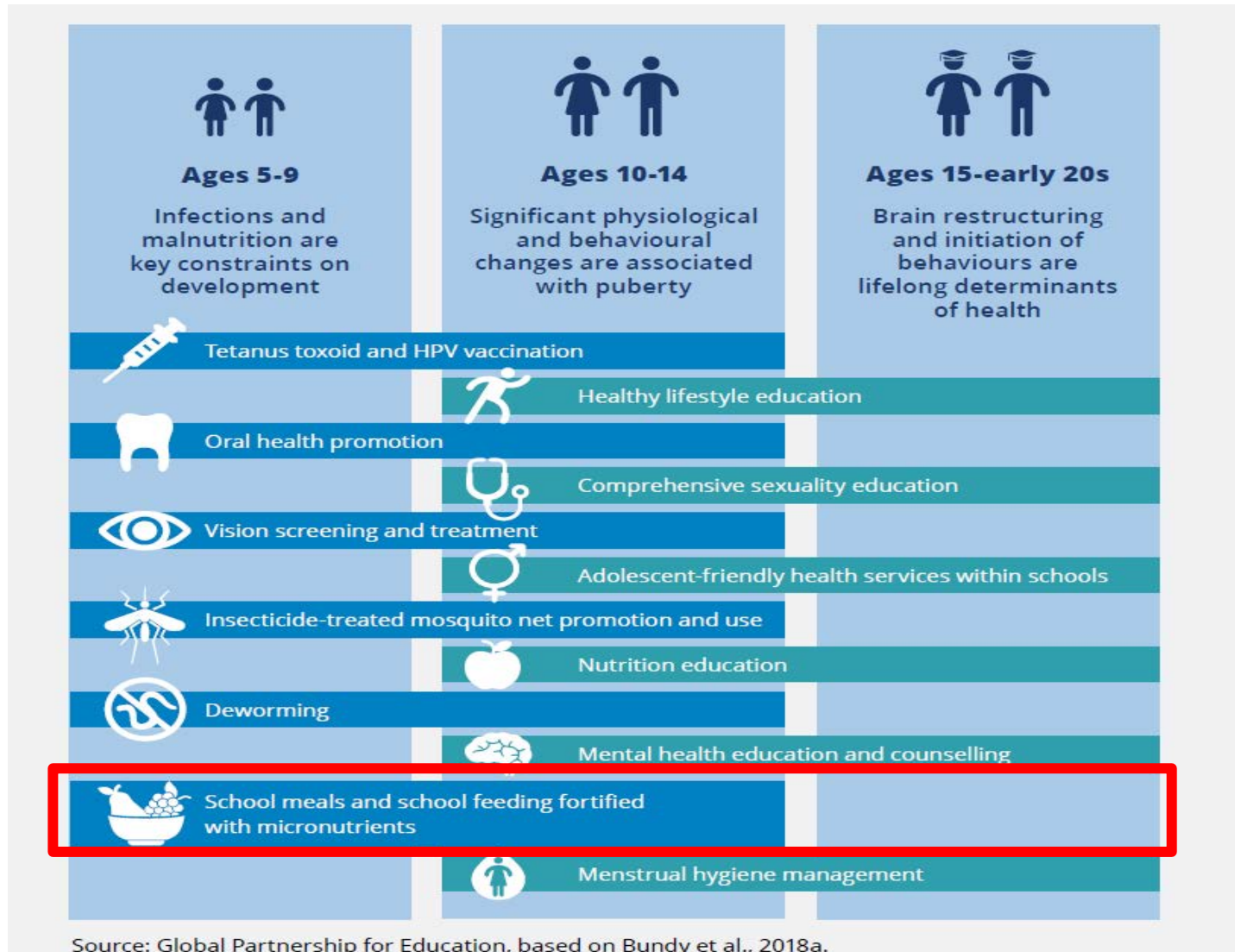
# Nutritional Ecology



## Interactions between developing children and environments

Children: complex internal biological systems (neurological, cardio-metabolic, etc.)  
Environments: complex external systems (climate, physical, social, food, home, etc.)

# Essential Health & Nutrition Interventions During School Years



# UN World Food Program (WFP)

- Established 1961: first school feeding program – Togo
- **2020 Nobel Peace Prize**
  - “for contribution to bettering conditions for peace in conflict-affected areas”
  - In 2020, 50% of school-age children (388 million) receive school meals daily in at least 161 countries
  - Government policies support school feeding - 90% of cost from domestic funds
  - School feeding supports access to schools (attendance) and learning
  - 73 million of most vulnerable children not reached

State of School Feeding Worldwide, WFP, 2020

# McGovern-Dole International Food for Education & Child Nutrition Program (IFEP)

- 2000 Pilot: donation of surplus agricultural commodities to school feeding programs in LMIC
- Farm Security and Rural Investment Act of 2002 (Farm Bill)
- Improving school attendance, especially girls
  - Girls permitted to attend school if a meal is provided
- FY2020, funding was at \$215 million
  - Current Farm Bill expires March 2023
- Farm Bill: largest financial commitment that U.S. government makes to food and nutrition

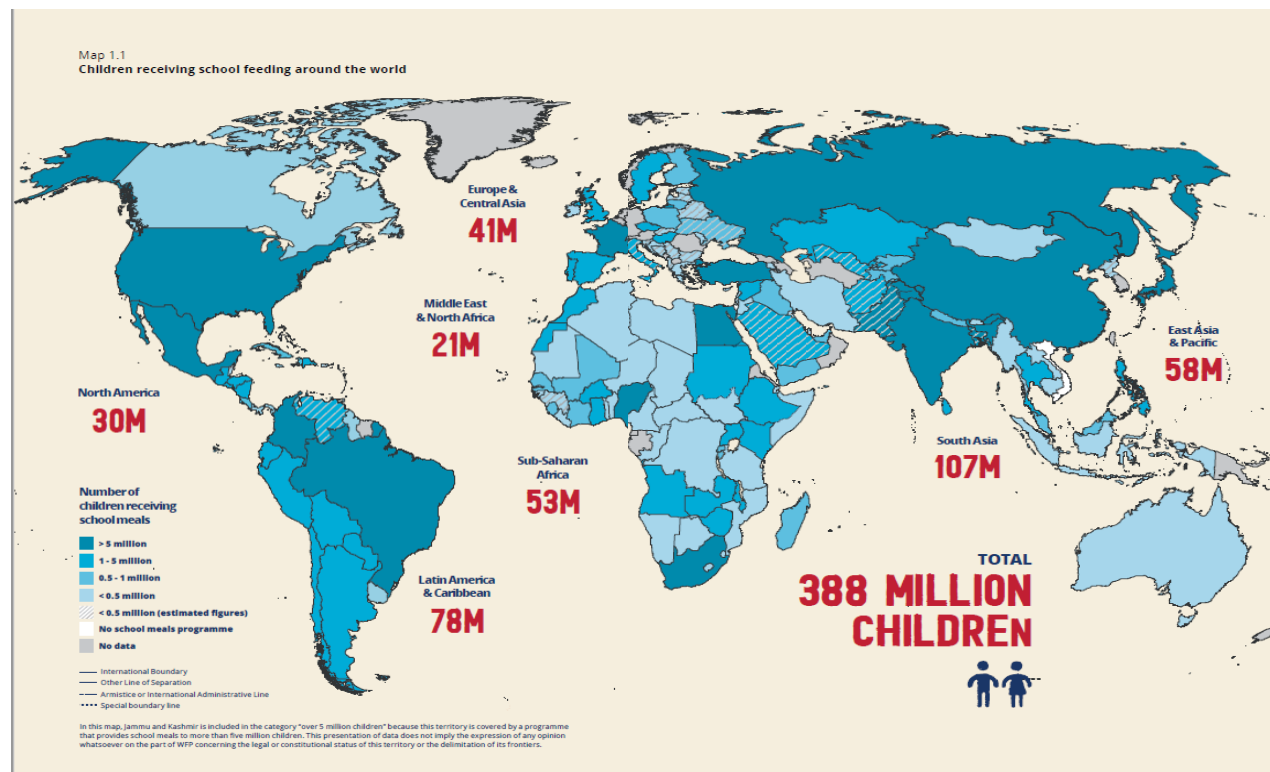
# School Feeding as social protection

- Global food and financial crises of 2008, school feeding offered multiple benefits to the most vulnerable children & families:
  - in-kind income support to families
  - learning and access to education
  - maintaining health and well-being
- Governments viewed school feeding as long-term social protection investment and short-term safety net.
  - Calls for greater rigor in the analysis of policy issues (Alderman and Bundy, 2012) and evaluations and trial design (Kristjansson et al., 2007).
  - Governments invest in school feeding because it addresses multiple issues.

Bundy, Rethinking School Feeding, 2009

# School Feeding Programmes

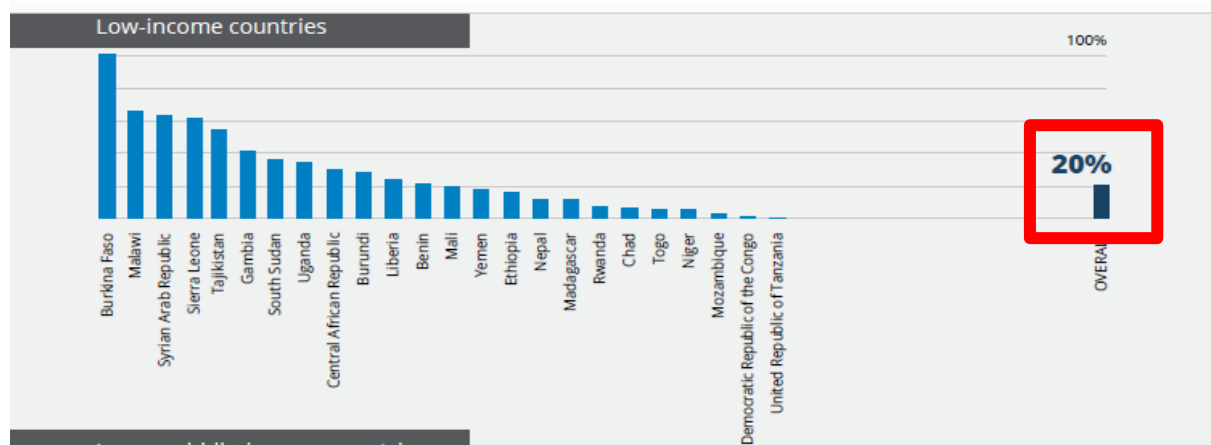
Largest programmes: India (90 million), Brazil & China (both 40 million), USA United States (30 million) and Egypt (11 million)



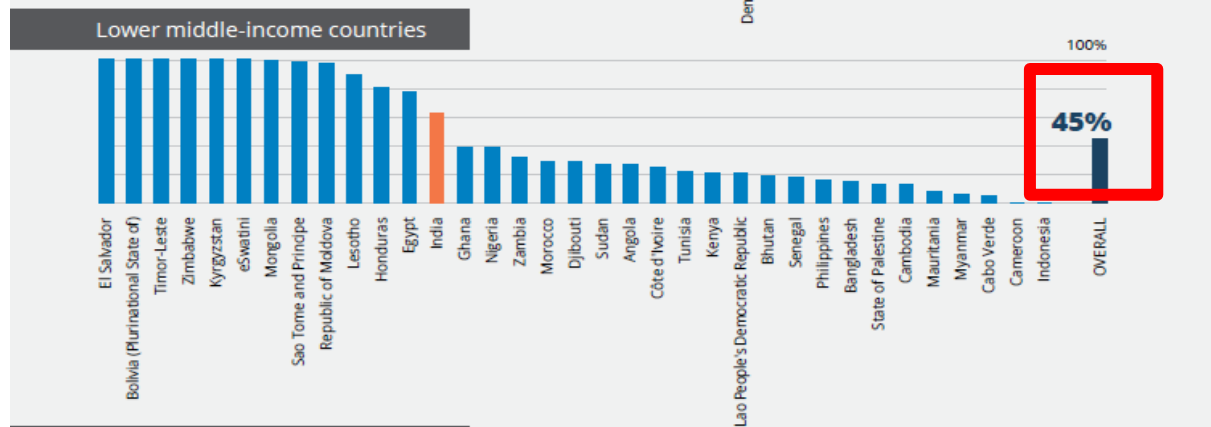


# Coverage of School Feeding Programmes

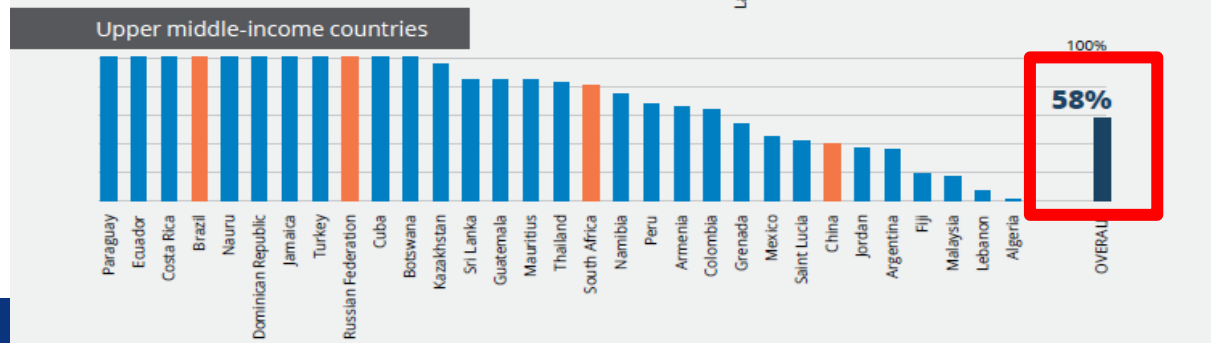
## Low-income countries



## Lower-middle income countries

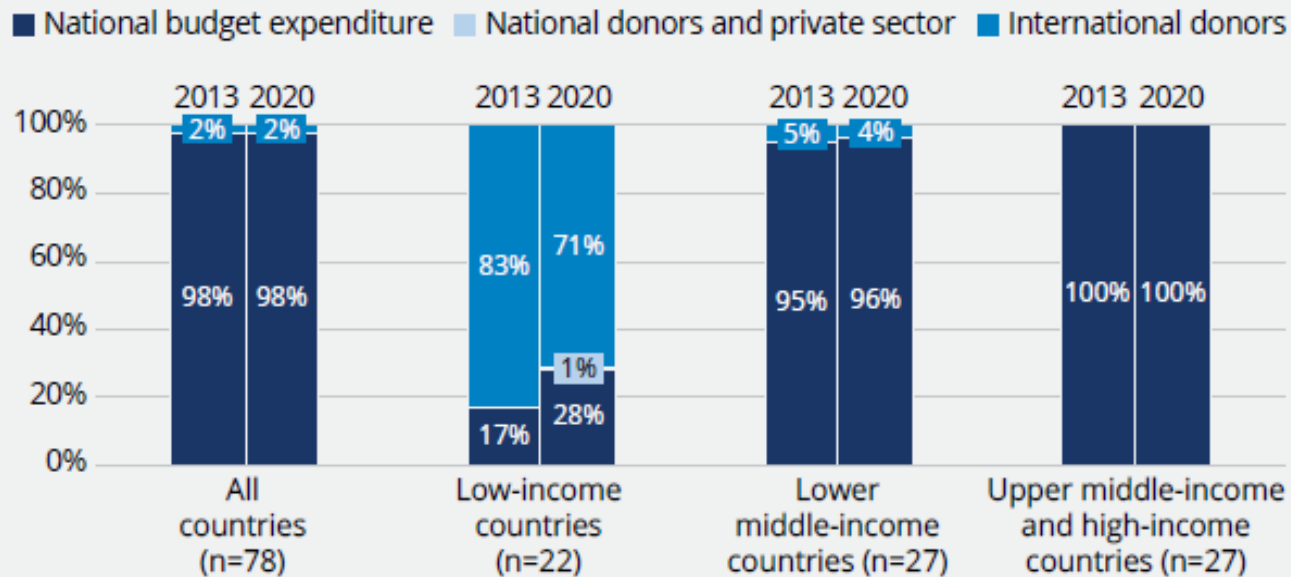


## Upper-middle income countries



# School Feeding Funding, 2013-2020

**Legend:** Domestic funding represents the largest share of funding for school feeding globally. Data suggest that governments in low-income countries almost doubled their level of funding relative to international donors between 2013 and 2020.

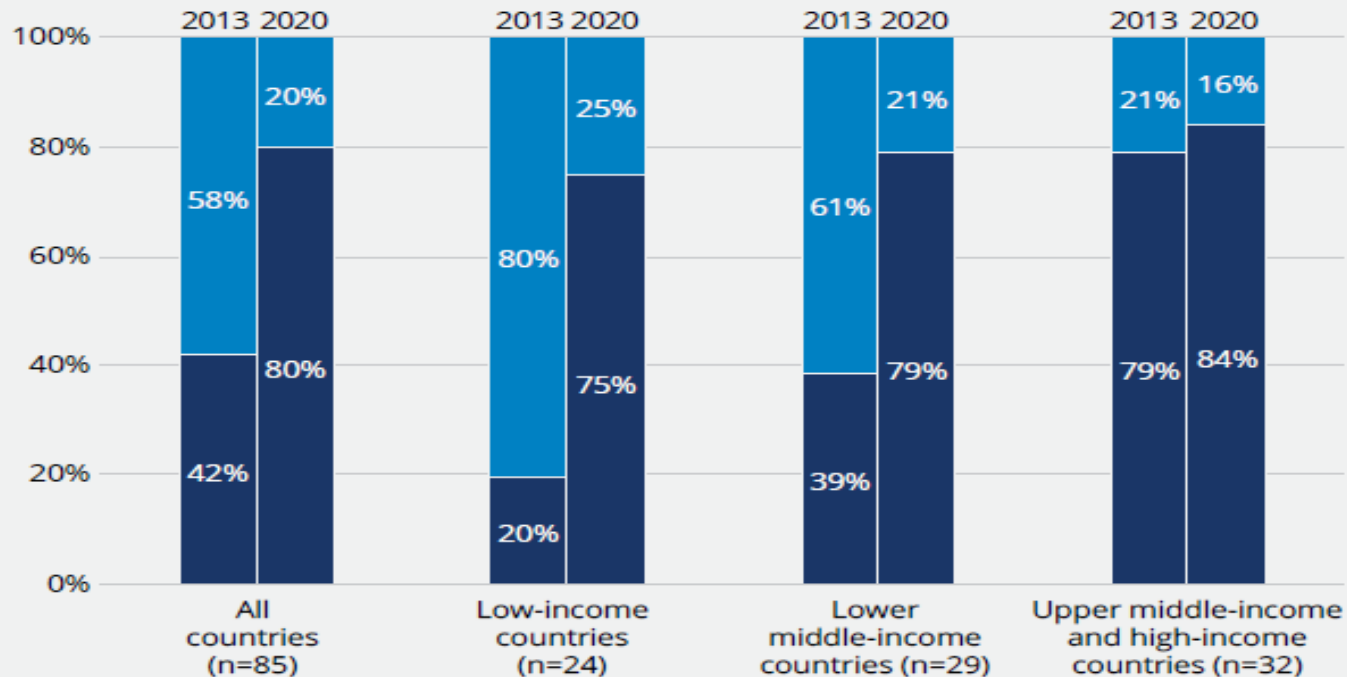


**>90% of funding is from domestic sources (governments)**

# School Feeding Policies, 2013-2020

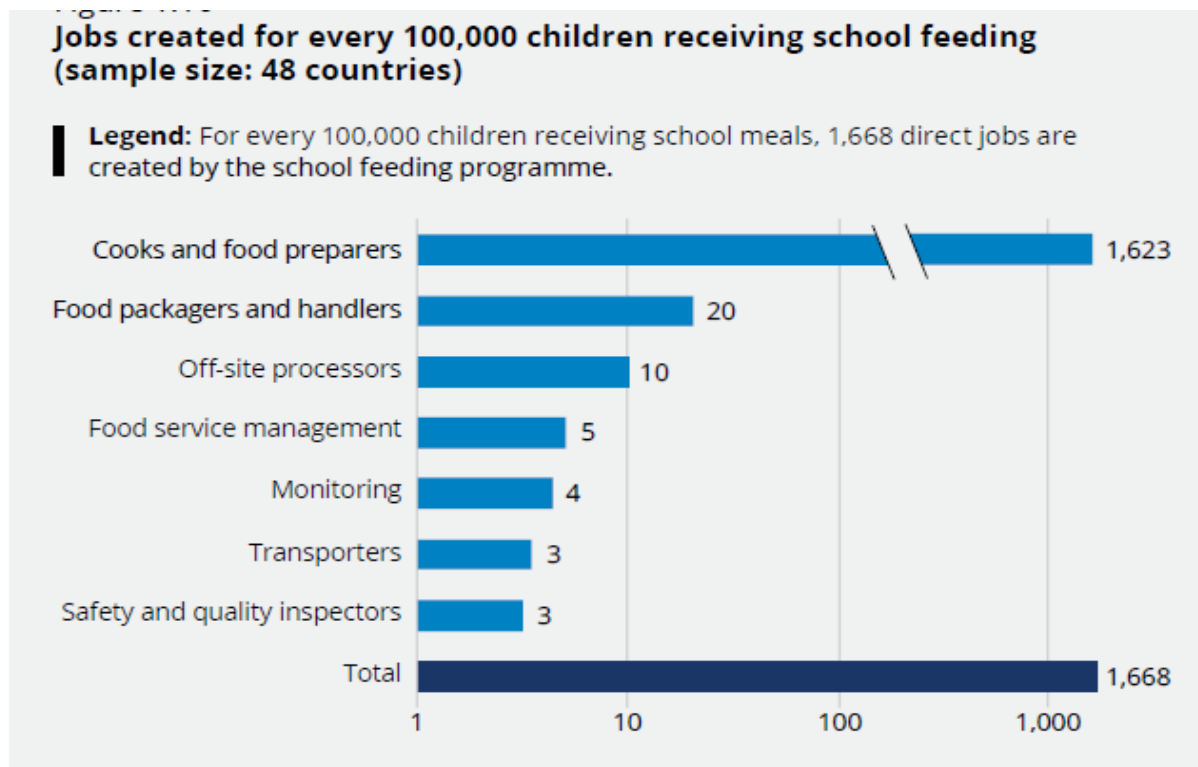
**Legend:** Since 2013, most countries have adopted a school feeding policy, indicating that increased financial investments are matched by strengthened legal and policy frameworks. The increase is particularly significant in low-income countries.

■ School feeding policy in place ■ No school feeding policy



**Significant increase in school feeding policies, links financial investment with legal and policy frameworks**

# Increased jobs associated with school feeding

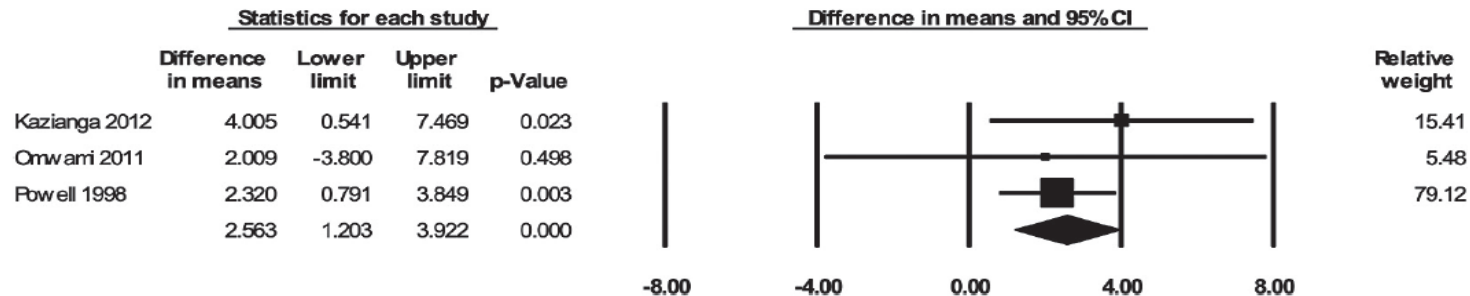


**For every 100,000 children receiving school meals, 1,668 jobs created (n=48 countries)**

# Meta-Analysis School Feeding Programs in LMIC, 2020

- 57 studies, child age 6-15 years, feeding pgm vs. control
- Beneficial effects on **weight** (0.58 kg over 12 months), **height** (0.32 cm over 12 months), and **attendance** (4.5 more school days attended)
- No impact on hemoglobin, serum ferritin, or **math scores**

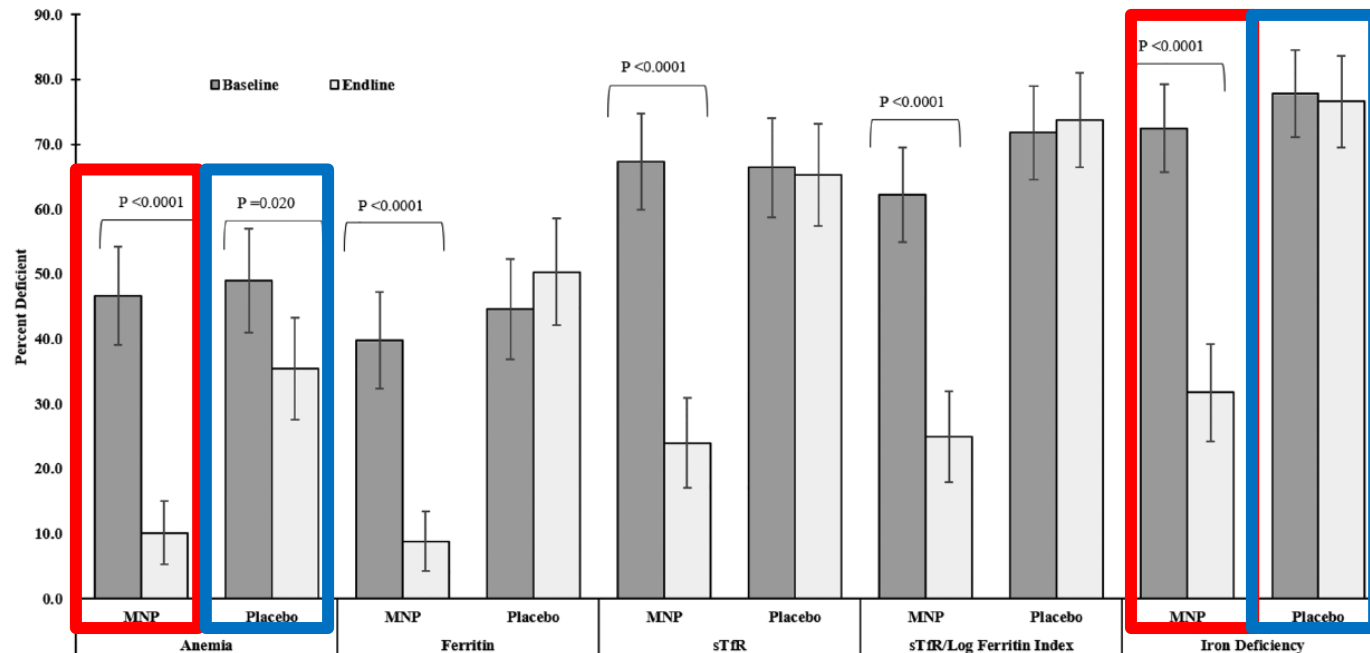
## School Attendance



**Figure 10.** Random-effects meta-analysis of school feeding interventions on 12-month change in school attendance (percentage of possible school days attended), comparing the group receiving school feeding intervention to the control group.  $I^2 = 0.00\%$ .

Wang D, Shinde S, Young T, Fawzi WW. Impacts of school feeding on educational and health outcomes of school-age children and adolescents in LMIC. *J Glob Health* 2021

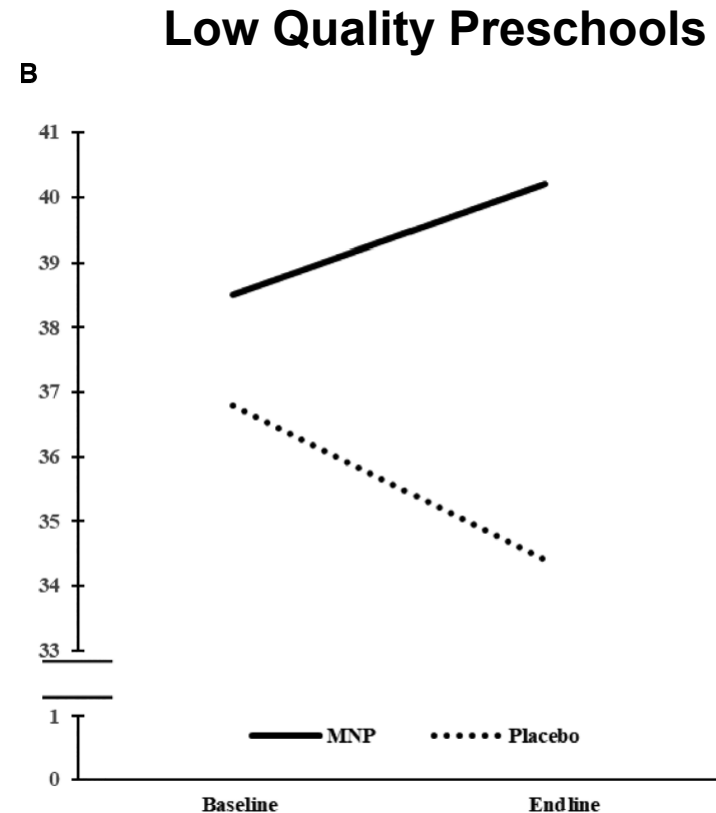
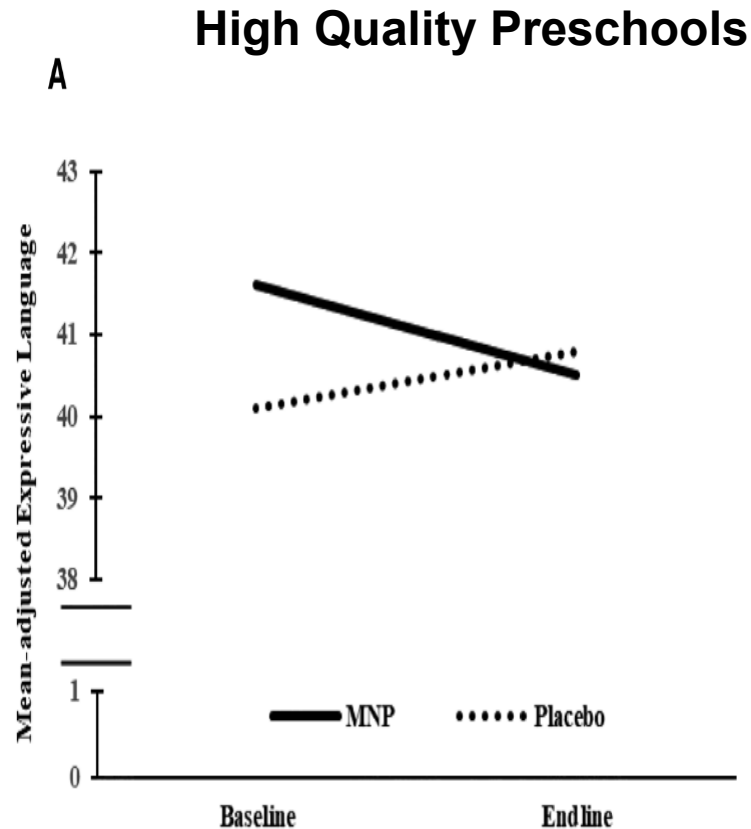
# Micronutrients added to mid-day meal reduced anemia among preschoolers in India



Mixed with “first bite” of cooked & cooled food

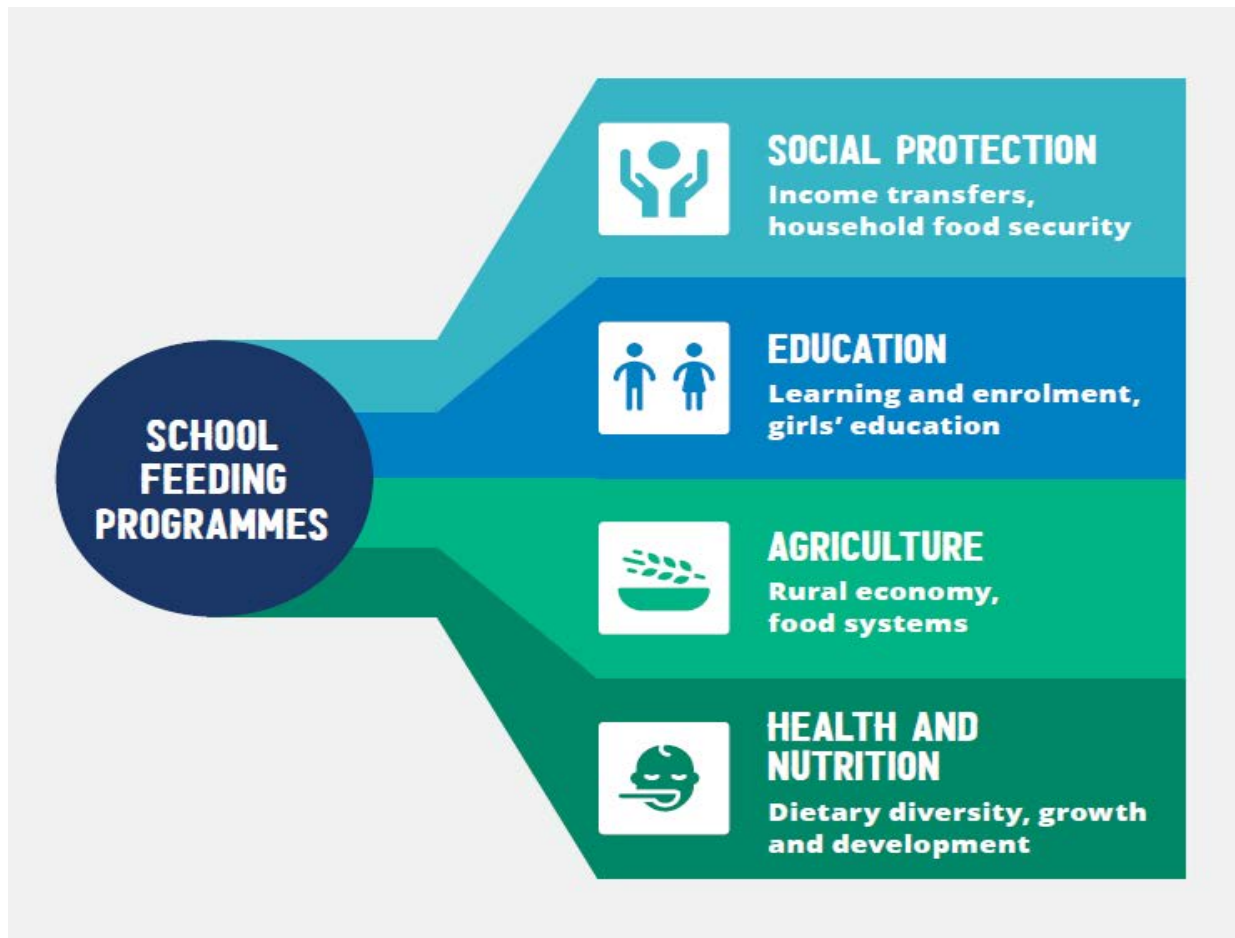
Black et al., A Randomized Multiple Micronutrient Powder Point-of-Use Fortification Trial Implemented in Indian Preschools. J Nutr, 2021

# Micronutrients added to mid-day meal promotes language among in low quality preschools in India



Black et al., A Randomized Multiple Micronutrient Powder Point-of-Use Fortification Trial Implemented in Indian Preschools. *J Nutr*, 2021

# Four Major Benefits of School Feeding Programs





# Systematic Review: Universal School Meals (OECD Countries)

- 47 studies (25 USA and 22 other OECD countries)
- Finland (1943), Sweden (1945)
- Many countries have nutrition standards for school meals
- Positive associations with attendance, diet quality, food security, and academic performance
- No adverse effects on BMI, some found protective effect on BMI
- Lower-income school districts positive financial outcomes from participation in universal free school
- Free meals associated with improved household incomes among lower-income families
- Benefits to socio-economically diverse student populations and countries

Cohen, Universal School Meals and Associations with Student Participation, Attendance.....*Nutrients*, 2021

# Research Gaps and Moving Forward

- Expand access to universal meals, especially for schools in vulnerable circumstances (extreme poverty, conflict areas)
- School meals included in WH Conference on Hunger, 2022
- Align school meals with nutritional guidelines
- Develop inclusive policies that incentivize sharing/distribution of existing resources (e.g., locally available fruit and vegetables)
- Evaluate financial impact of school meals on families, schools, and communities
- Evaluate relations between universal meals and academic performance considering pedagogical variations (school quality)
- Integrate relations between universal school meals and environmental issues, including climate, peace, social protection, child rights

# Thank you!

