



NATIONAL NUTRITION CONFERENCE ETHIOPIA 2021

GENERATION AND MOBILIZATION OF NUTRITION
EVIDENCE TO TACKLE MALNUTRITION: FROM DATA TO ACTION

The role of Research in nutrition design and implementation of nutrition programs

(How can academic research be used to inform policy)

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Introduction

 **policy** *noun*

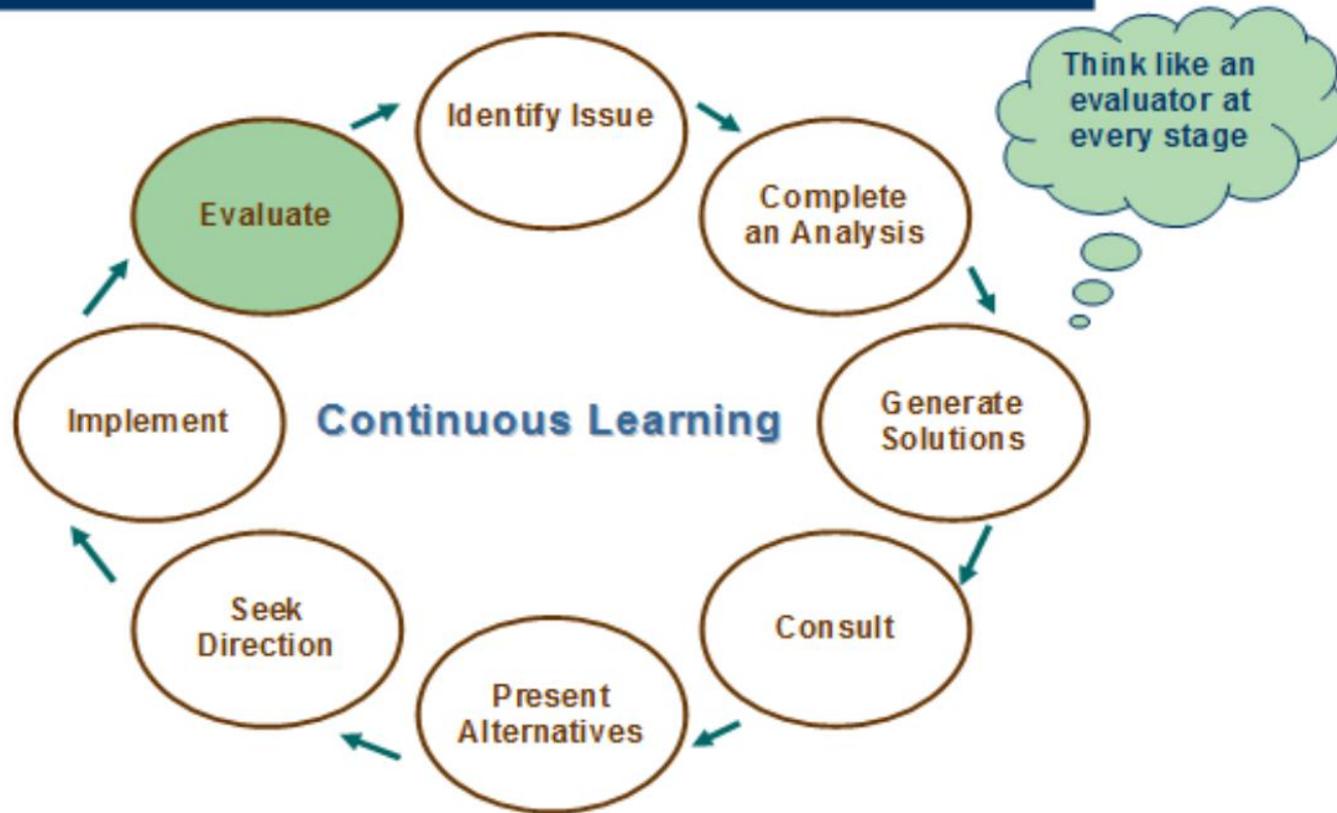
/ˈpɑːləsi/ 
(pl. policies)

*“a definite course or method of action selected **among alternatives** and in light of **given conditions** to guide and determine **present and future decisions**”*



Introduction

- The policy life-cycle



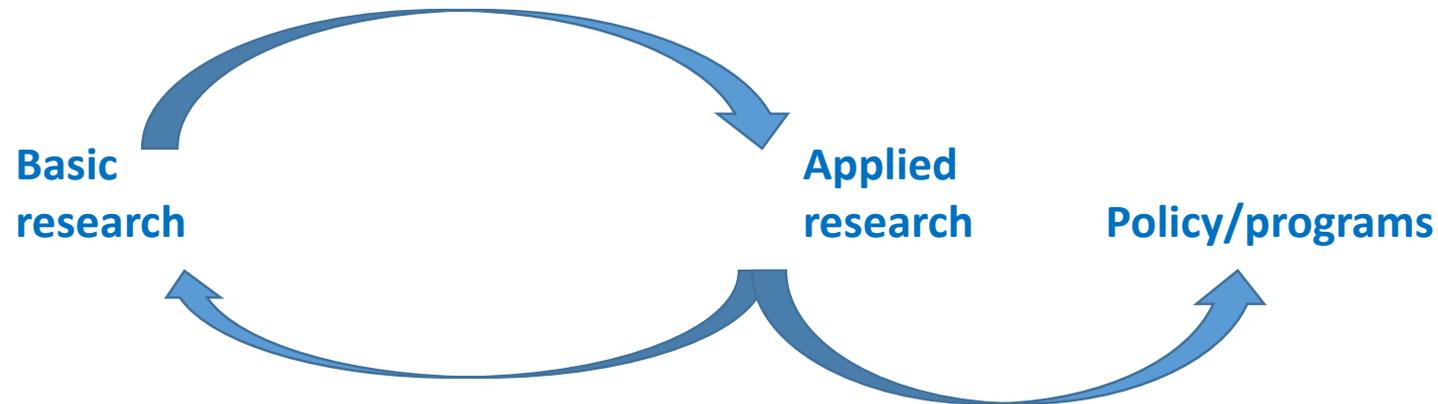
Research in academia

Basic research

Aims at expanding knowledge by creating new theories and modifying existing ones

Applied research

Focused on providing practical solutions to specific problems by analyzing empirical evidence



Research in academia

Various goals including:

- Teaching
- Community outreach
- Career advancement
- Contribute to policy...

Various ways of conducting research

- Collaborative
- Involve students/faculty led

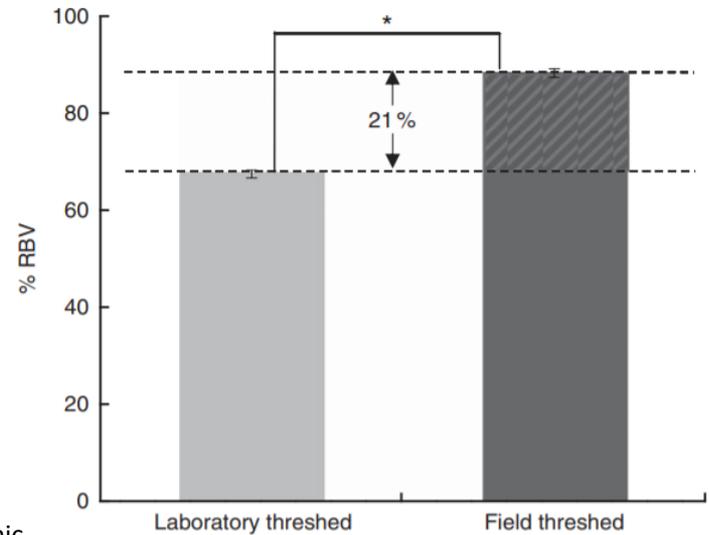
Can basic research inform policy/programs?

Example on iron fortification policy

- Iron intake was found high, despite very low consumption of iron-rich foods (e.g. ASF)
- Questions on the source and bioavailability of the iron was raised, hampering decision on Fe fortification in Ethiopia



Guja, H., & Baye, K. (2018). Extrinsic iron from soil contributes to Hb regeneration of anaemic rats: implications for foods contaminated with soil iron. *British Journal of Nutrition*, 119(8), 880-886.



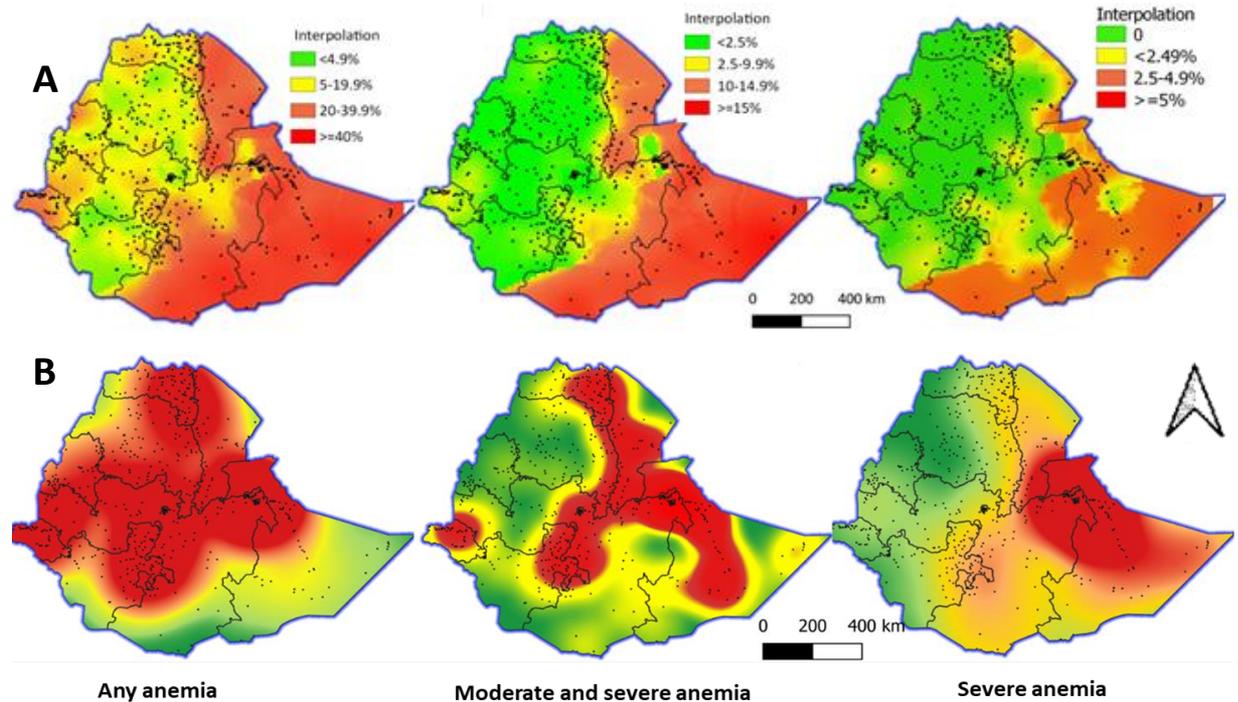
Relative biological values (RBV) of laboratory- and field-threshed teff

Emperical evidence

Given finite resources, in which areas should anemia prevention be prioritized?

Maternal anemia

- Coverage-equity paradox

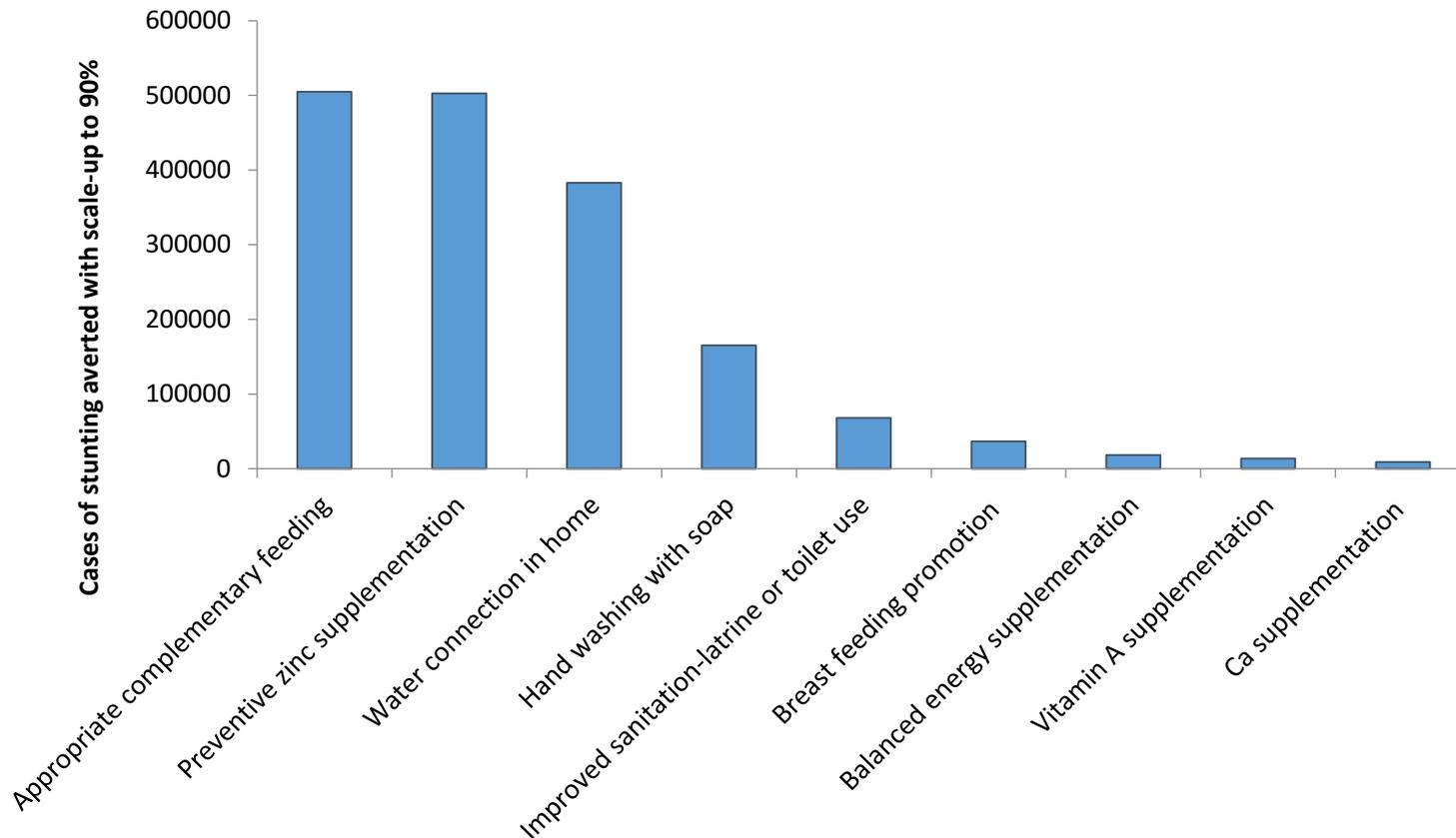


Predicted anemia prevalence (A) and case-load density (B) by severity, 2016

Asmamaw B, Laillou A, Chiteweke S, Beyene J, Baye K (2021) Sub-national mapping for targeting anemia prevention in women of reproductive age in Ethiopia: a coverage-equity paradox

Prioritizing maternal, newborn, and child health interventions

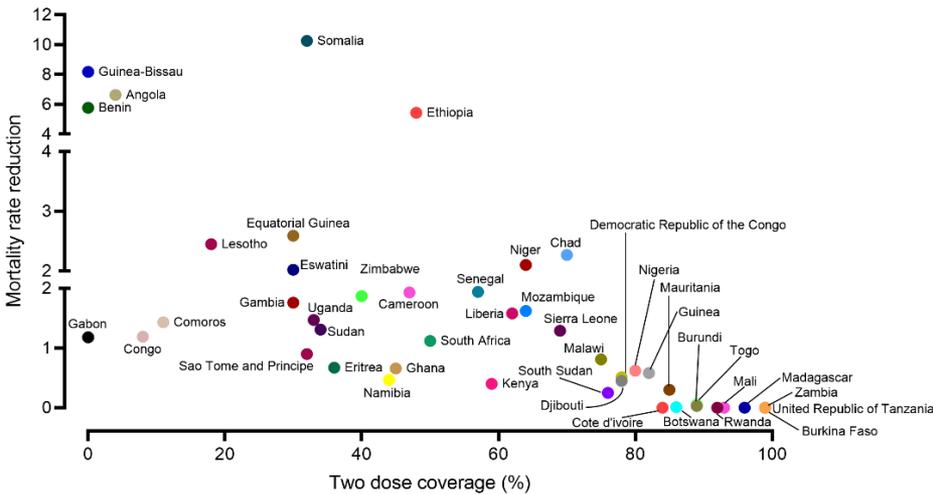
Among a set of proven maternal child nutrition interventions, which ones are likely to lead to higher cases of stunting being averted?



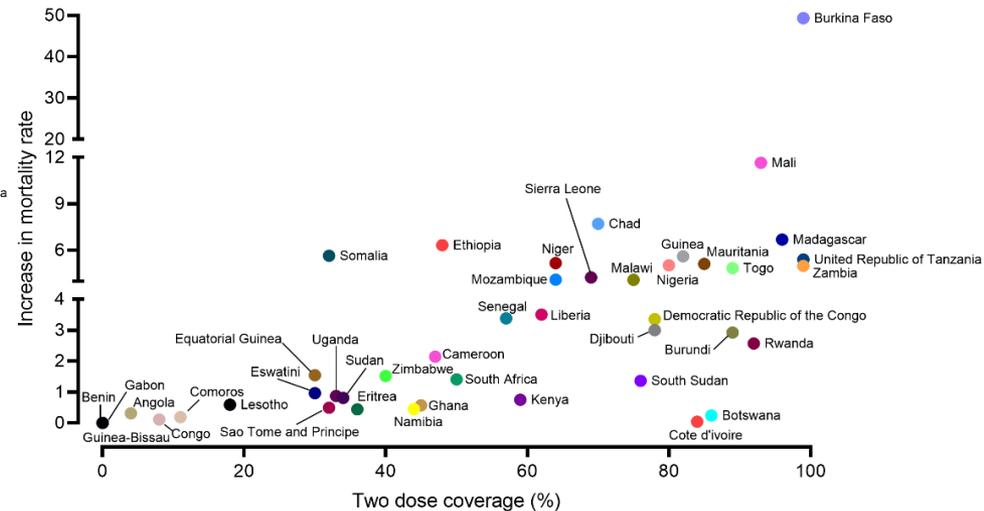
Baye, K (2020) Prioritizing the scale-up of evidence-based nutrition and health interventions to accelerate stunting reduction in Ethiopia. *Nutrients* .

Vitamin A supplementation

Are VAS still needed or should some countries start scaling-back?



Scenario 1: scale-up to $\geq 90\%$ coverage



Scenario 2: scale-back

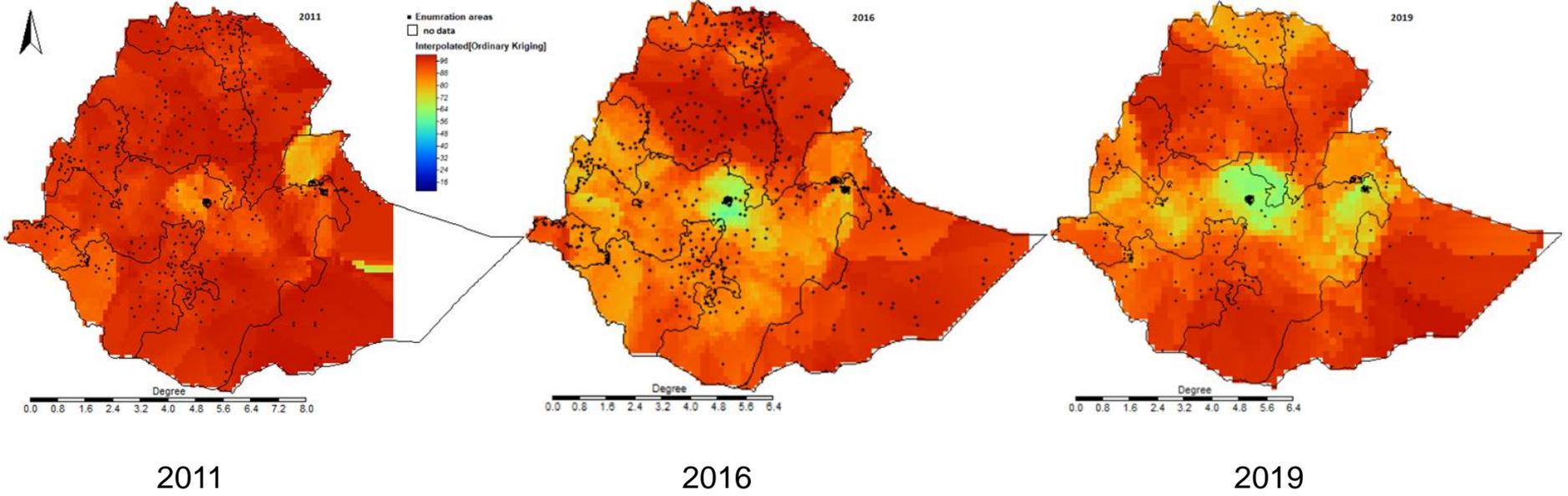
Baye et al., (forthcoming) Estimates of child mortality reductions attributed to vitamin A supplementation in Sub-Saharan Africa: scale-up, scale-back, or re-focus

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Complementary feeding trends

Are nutrition interventions implemented in the last decade making progress in dietary diversity?

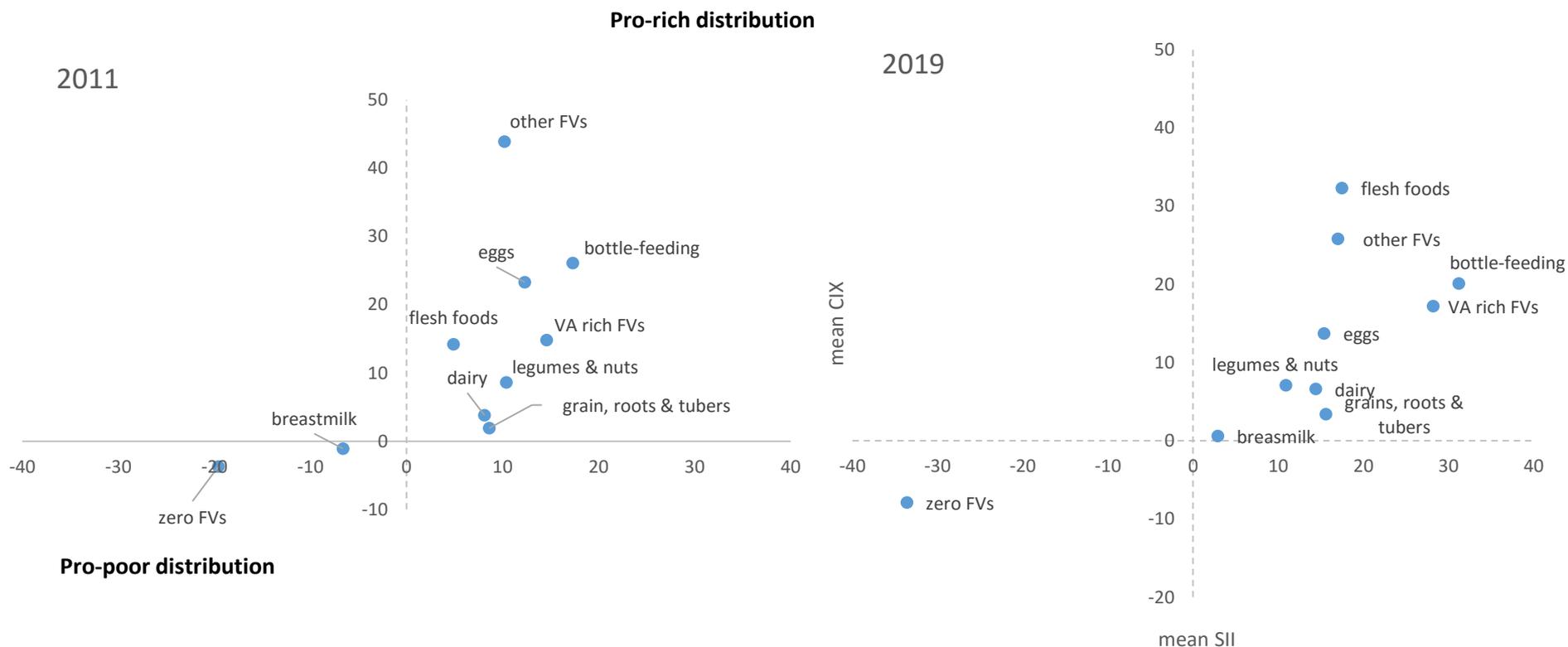
Geospatial trend in MDD



Tizazu, W., Asmamaw B, Lailou A, Chiteweke S, Baye K (forthcoming) Trends and inequalities in diet quality of infants and young children of Ethiopia

Food-group level inequality

Which food groups have higher inequalities?



Concentration index (CIX), Slope index of inequality (SII)

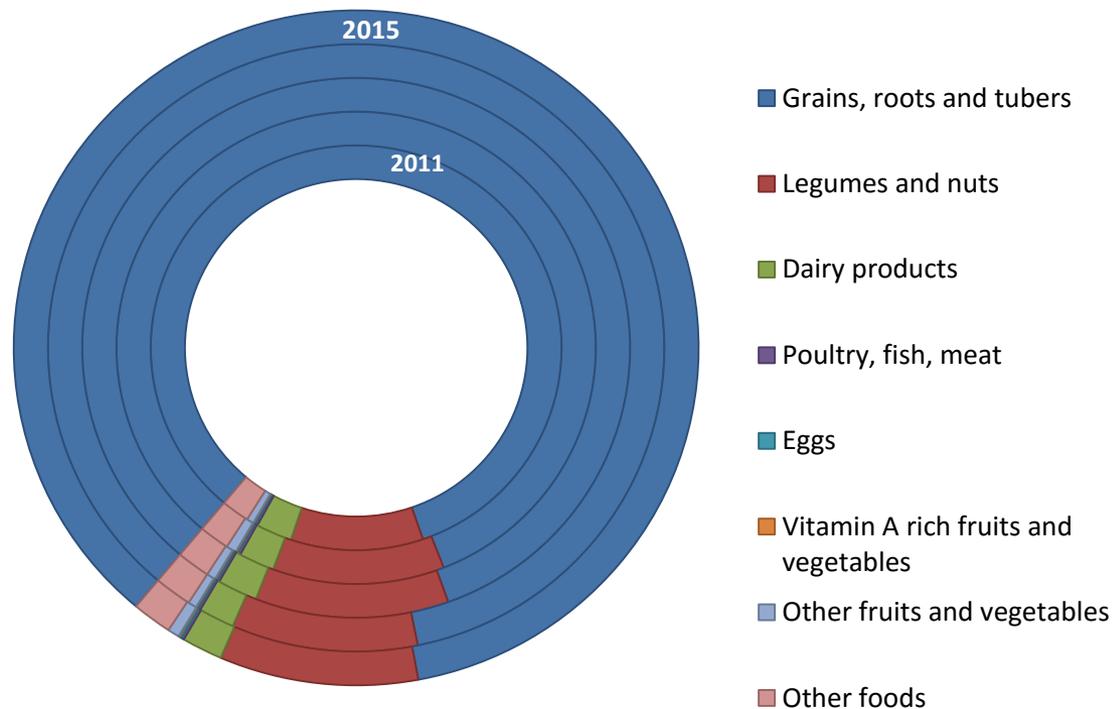
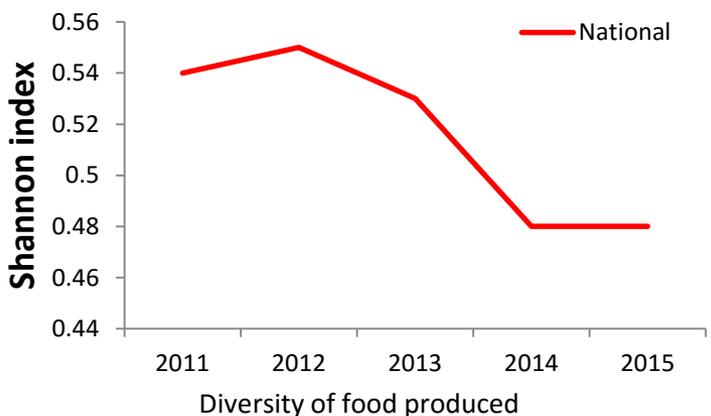
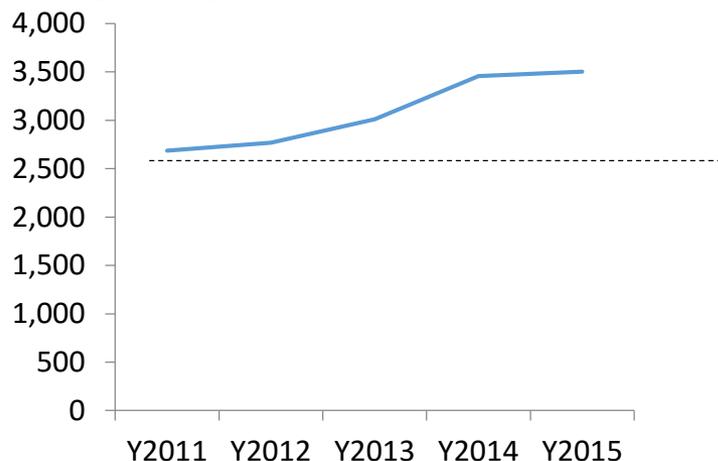
Tizazu, W., Asmamaw B, Laillou A, Chiteweke S, Baye K (forthcoming) Trends and inequalities in diet quality of infants and young children of Ethiopia

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Food supply (quantity and diversity)

Is the food supply supporting dietary diversity?

Energy (kcal)



Baye, Hirvonen, Dereje & Remans. 2019 Energy and nutrient production in Ethiopia, 2011-2015: Implications to supporting healthy diets and food systems. *Plos One* 14 (3), e0213182

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Maternal depression

Are there unaddressed maternal characteristics hampering progress?

- In PSNP households in Wollo, maternal post-partum depression (EPDS \geq 13) was prevalent (22.8 %) and was significantly associated with:
 - inappropriate complementary feeding
 - stunting (P <0.05)



Anato, A., Baye, K., Tafese, Z., & Stoecker, B. J. (2020). Maternal depression is associated with child undernutrition: A cross-sectional study in Ethiopia. *Maternal & child nutrition*, 16(3), e12934.

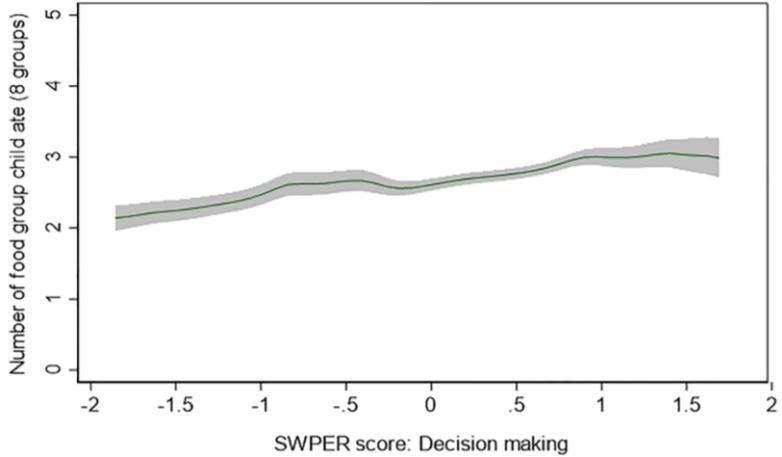
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Women empowerment-nutrition

Could women empowerment contribute to better diets?



Changes in **women empowerment explained 17%** of the change in MDD

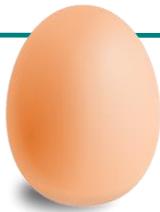


Explained part	
Variables	Contribution (%)
Region	11
SWPER: decision-making SWPER score	10
SWPER: autonomy/social independence	6
SWPER: attitude to violence	1
Respondents' current age in years	1
Attended 4+ ANC visits	5
Residence: urban	5
Wealth score (0-10)	4
Child age in months	3
Number of children 5 and under	-2

Estimated contribution of each explanatory variable, in actual and percentage points for MDD among children aged 6–23 months between 2005 to 2016: Fairlie’s non-linear decomposition analysis (n=3,596); total explained change

Baye, K., Laillou, A., & Chitekwe, S. (2021). Empowering women can improve child dietary diversity in Ethiopia. *Maternal & Child Nutrition*, e13285.

Innovations to improve diets

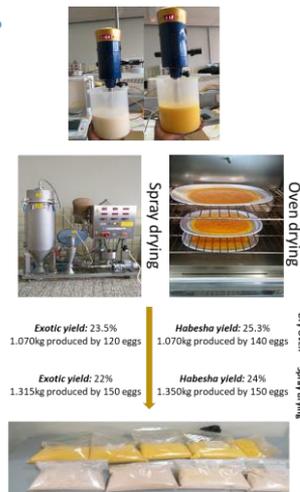


Eggs into egg powder:

Processing the whole eggs into powder and product prototypes can have the following advantages : **i)** Relative to fresh eggs, the powder could be more **accessible**; **ii)** Egg powder is a **shelf-stable** and safer product; **iii)** It can fill local production gaps through **cost-effective transportation**; **iv)** It **reduces food loss** through breakage, spoilage, etc.; and **v)** It can be easily **integrated into traditional and commercial recipes**

Feasibility: How can it be processed and what will be the added value?

2 methodologies tested during the first semester of 2020



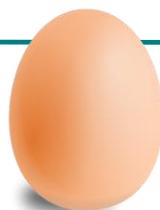
RESULTS

- The spray drying of both egg types resulted in whole egg powders with **optimal physical and techno-functional properties** as reflected by the low water activity, > 97% yield, and high nutrient composition;
- The high emulsion and oil absorption capacity suggests that a **homogenous mix with other ingredients is possible**
- The high foaming capacity also suggests that the drying process **did not induce significant denaturation of proteins**
- With just **6 g** of whole egg powder, the **protein requirements from CF can be fulfilled**, and with only **~4 g** (about 1/3 of an egg= 49 mg choline), **100% of choline requirements** (45.9 mg) can be fulfilled
- **Long shelf life** above 12 months (stability implemented in AAU)



Abreha, E., Getachew, P., Laillou, A., Chitekwe, S., & Baye, K. (2021). Physico-chemical and functionality of air and spray dried egg powder: implications to improving diets. *International Journal of Food Properties*, 24(1), 152-162.

Simulating potential impact of such innovations



VS

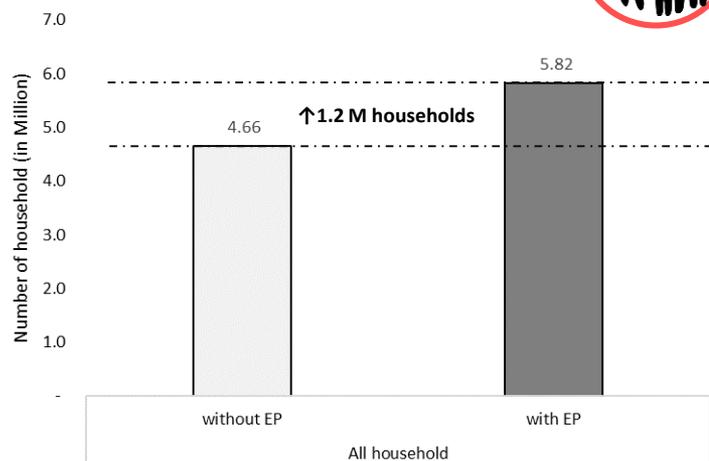
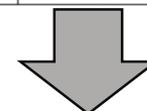


Figure - Number of households (in millions) that can afford the minimum cost nutritious diet before and after integration of egg-powder (EP) into the market

This is an additional ~1.2 million households affording the minimum-cost nutritious diet, representing 4-6 million individuals depending on the size of the households

Table - Share (%) of food expenditure needed to be spent for a child (6-23 months) to consume the minimum nutritious cost diet by household wealth quintile

Wealth quintile	Total food expenditure (ETB)		Food expenditure (for U2 child)	% of food expenditure for HH with U2 child					
	All HH	HH with U2		CoD baseline	EP 2.0 ETB	EP 1.71ETB	EP 1.5 ETB	EP 1.3 ETB	EP Free
poorest	14,053	15,487	1,434	134.6	128.90	128.87	128.03	127.38	87.87
second	19,400	21,573	2,173	88.9	85.07	85.04	84.49	84.06	57.98
middle	25,313	28,489	3,176	60.8	58.20	58.19	57.81	57.51	39.67
fourth	28,031	33,389	5,358	36.0	34.50	34.49	34.27	34.09	23.52
richest	34,063	45,816	11,753	16.4	15.73	15.72	15.62	15.54	10.72
National	24,171	26,293	2,122	91.0	87.11	87.09	86.52	86.08	59.38



Different delivery will be needed and pricing system:

- Free distribution through bilateral donors or gvt system
- Accessible in the market but with price subsidy
- Full market access at higher cost with better packaging to support subsidized price

Baye K, Abera A, Chitweke S, Getachew P, Dibari F, Laillou A (2021) Whole egg-powder makes nutritious diet more affordable for Ethiopia: a cost of the diet and affordability analyses

Summary

- As tried to illustrate research conducted in academic institutions contribute to the various stages of the policy making
- Basic research, although not directly contributing to policy making, can shape decision making
- Academic research should not be seen as only having one purpose- pre-requisite for academic degree
- Academic research generate evidence and move it towards policy; policy-makers use the evidence for policy



Thank you!



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