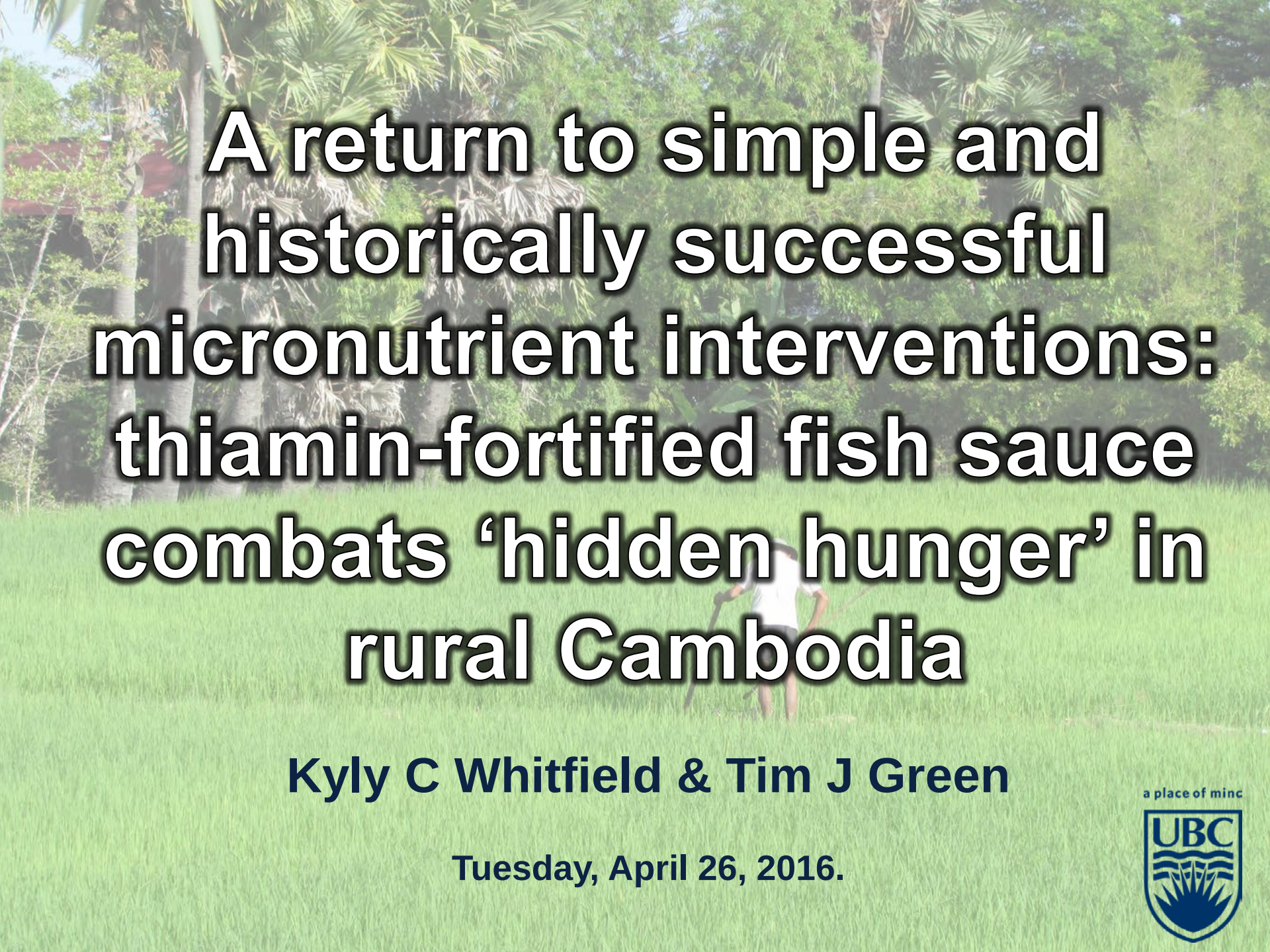




A return to simple and historically successful micronutrient interventions: thiamin-fortified fish sauce combats 'hidden hunger' in rural Cambodia

Kyly C Whitfield & Tim J Green

Tuesday, April 26, 2016.

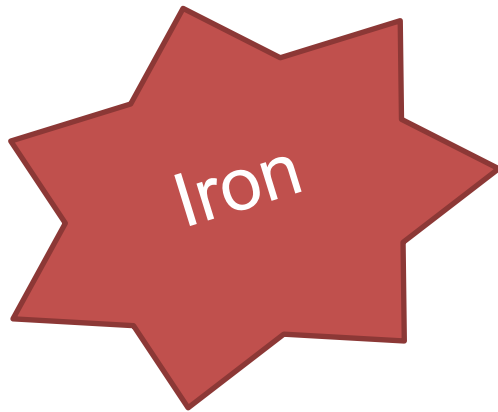
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‘Hidden hunger’



Common 'hidden hunger' diseases



'Hidden hunger' in Southeast Asia



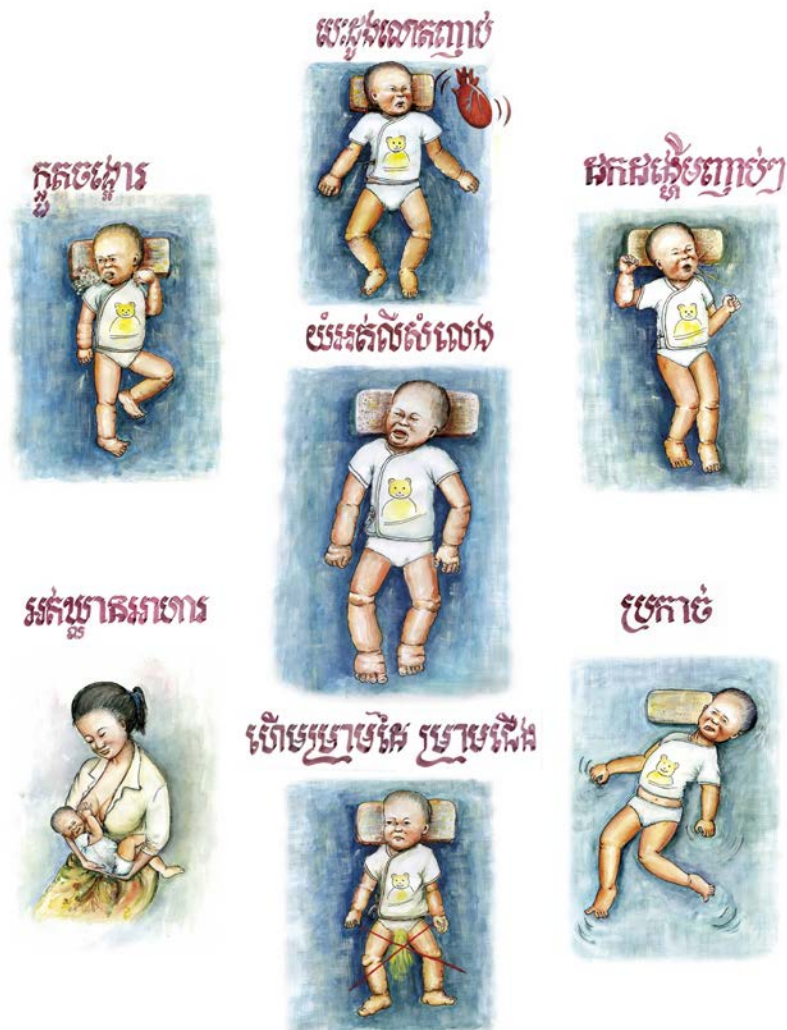
Karen People of Mae La Refugee Camp

- Thai-Burmese border; settled in **1986**
- High infant mortality rate *unrelated* to major killers
 - diarrhea and respiratory illness
- Between 1987 – 1990, **40%** of all infant deaths attributable to infantile beriberi



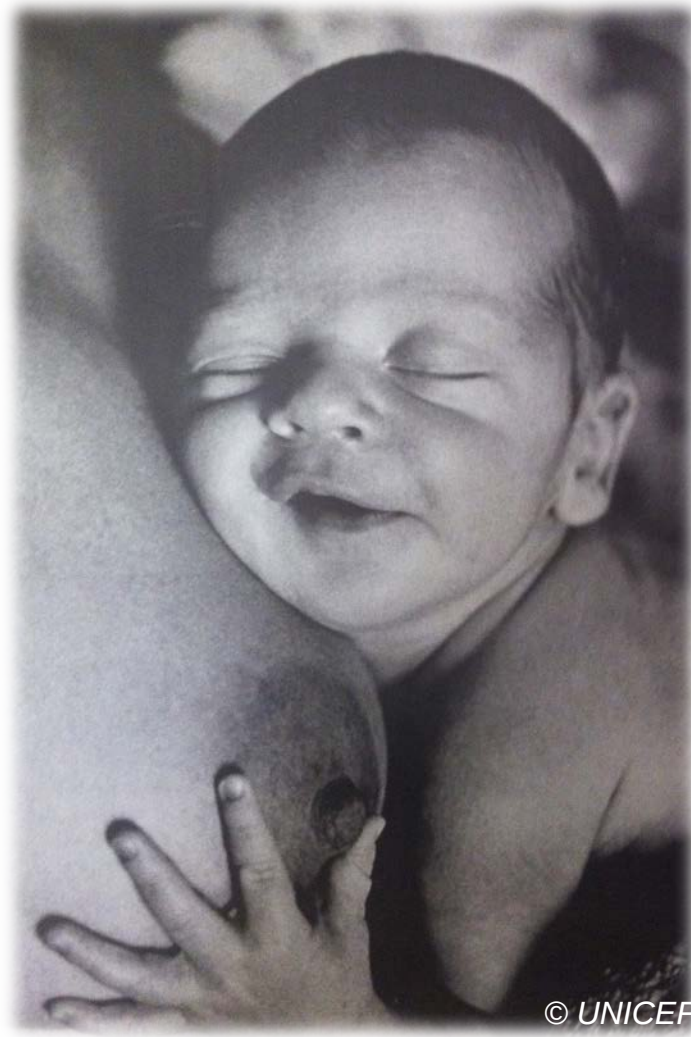
McGready et al 2001; Luxemburger et al 2003; Stuetz et al 2012

Infantile beriberi



- Stems from thiamin (vitamin B₁) deficiency
- Mortality within hours of presentation
- Presents around 3 months of age

Exclusive breastfeeding period



Thiamin deficiency and beriberi



low dietary maternal intake
=
low breast milk [thiamin]
=
high risk of infantile beriberi

Allen 2012 Adv Nutr 3(3):362-9



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White polished rice



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Ways to combat hidden hunger





Low cost



Targeted



Sustainability



Distribution



Culturally appropriate



Passive

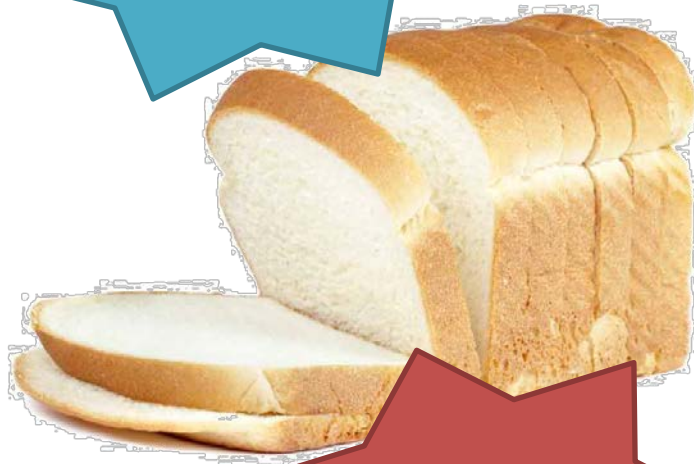


Common 'hidden hunger' diseases



Iodine

Folate



Iron



Vitamin A

Vitamin D

Thiamin deficiency and beriberi



Fortification vehicles



Fortified fish sauces

Control:
no
thiamin



LC
[low]
thiamin
(2 g/L)

HC:
[higher]
thiamin
(8 g/L)

Thiamin-fortified fish sauce RCT

	Baseline ($t=0$)	Endline ($t=6\text{mo}$)
		
		

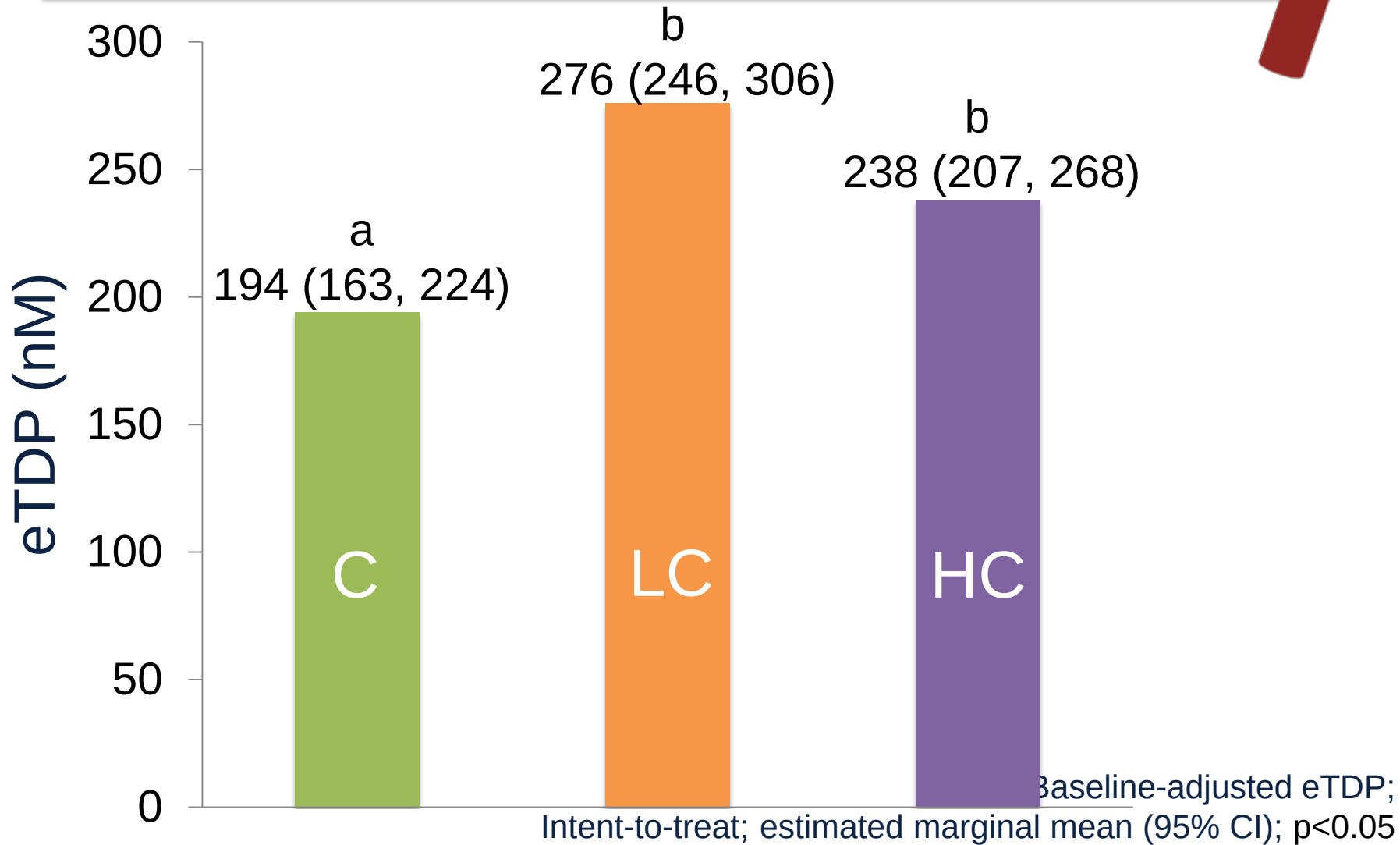


Demographics

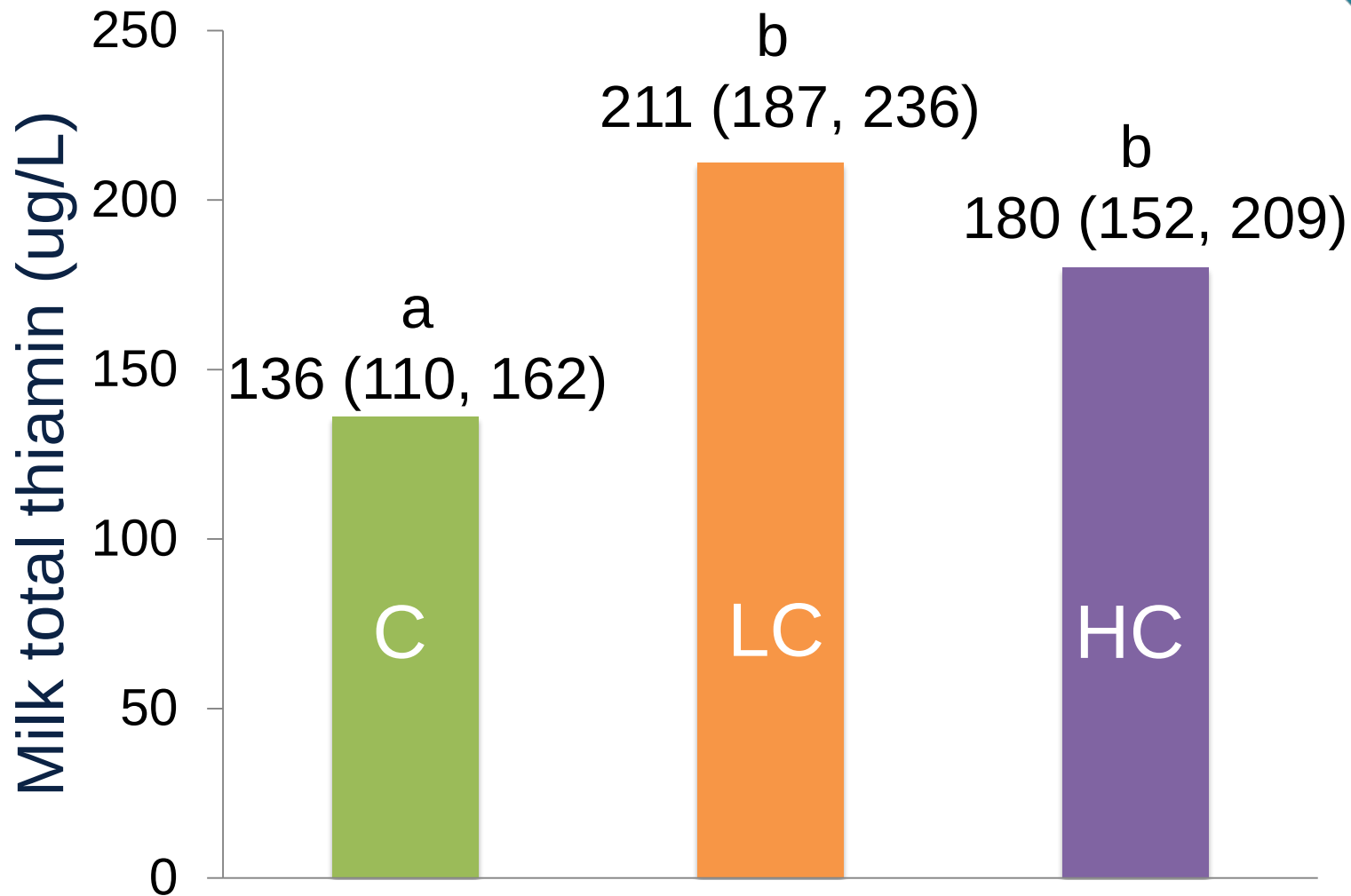
	Control n=28	LC n=29	HC n=28
Mothers			
Age, y	27 ± 5	26 ± 5	25 ± 5
Weeks pregnant	23 ± 8	22 ± 7	25 ± 8
Primipara	13 (46%)	16 (55%)	14 (50%)
Household popln	5 ± 1	5 ± 2	5 ± 1
Infants			
Girls	14 (52%)	13 (46%)	9 (39%)
Birth weight, kg	3.1 ± 0.5	3.0 ± 0.4	3.1 ± 0.9
Birth length, cm	49 ± 2	49 ± 2	49 ± 3



Mother eTDP

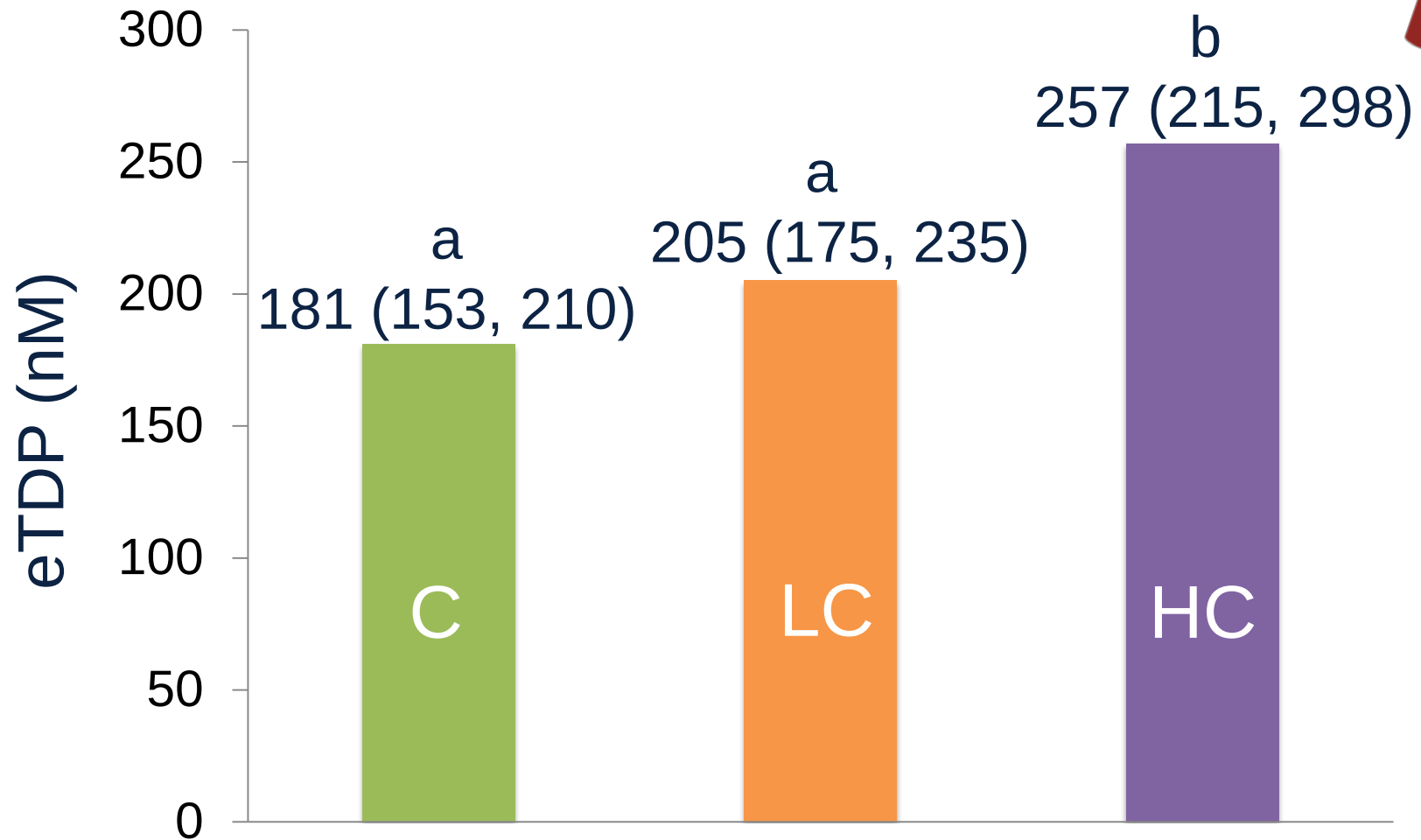


Human milk total thiamin



estimated marginal mean (95% CI); $p < 0.05$

Infant eTDP



estimated marginal mean (95% CI); $p < 0.05$



Fortification

- Fortification has high potential in low resource settings
- Highly dependent on cultural context, micronutrient of interest





Thank you!



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