Macro- and Micronutrient Intake in Children aged 12-23 Months in Lao PDR: A Community-cased Cross-sectional Study

Souksamone Thongmixay[1], Nilupa S. Gunaratna[2], Vanphanom Sychareun[1], Latsamee Radsavong[1], Chandavieng Phimmavong[1], Susmita Ghosh[2]

[1]*Faculty of Public Health, University of Health Sciences, Lao PDR*

[2]*Purdue University, USA*

Introduction

- Child malnutrition is a persistent problem in Lao PDR
- Stunting, indicating chronic undernutrition, increases during the transition from exclusive breast feeding to complementary feeding period[1]
- In Lao PDR, 38% of babies are introduced to complementary foods too early while 55% of children aged 6 months to 2 years do not have a sufficiently diverse diet[1]
- These suboptimal infant and young child feeding (IYCF) practices can lead to inadequate intake of macro- and micronutrients, which can affect children's growth and development across the life course
- However, in Lao PDR, there is limited data on nutrient intakes in infants and young children
- We therefore conducted a cross-sectional assessment of nutrient intakes in children aged 12-23 months in the Central Region of Lao PDR

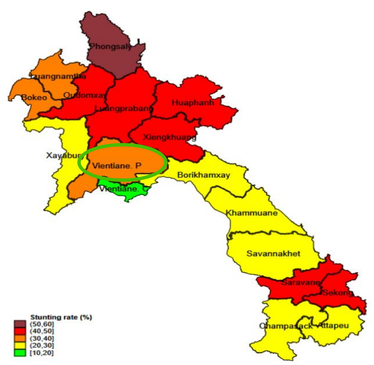
Research Question

How adequate are nutrient intakes among children aged 12-23 months in Lao PDR?

Methods

Study design

- Study area: Vientiane Province (Phonhong and MeangFeung Districts)
- Study population: children aged 12–23 months
- Community-based, cross-sectional survey
- Two stages of cluster sampling with family as the cluster unit
- Respondents: 189 mothers or caregivers of 12–23-month-old children
- Study was approved by the University of Health Sciences institutional review board



Source: Laos Social Indicator Survey (LSIS), 2017

Study tool

- Structured questionnaire
- Socio-demographic characteristics of household, parents, and children
- Complementary feeding practices for children aged 12–23 months
- Dietary assessment using 24-hour recall: child intake as reported by mother/ caregiver

Statistical analysis:

- Data were entered into MS Excel and analyzed using SPSS 22 and Stata 17
- Nutrient intakes were calculated using INMUCAL-Nutrients version 4.0

Results

Table 1: Social demographic characteristic (n=189)

Variable	Mean/n	SD (Min, Max)/%
Age of child (months)	18.5	SD=3.9 (Min=12 Max=23)
Age of mother (years)	29.1	SD=5.5 (Min=17 Max=44)
Ethnicity of Mother		
Lao	118	62.4
Hmong-Mien	32	16.9
Mone-Khamer	39	20.6
Education of Mother		
Illiterate (No formal education)	12	6.3
Primary school	50	26.5
Secondary/High school	86	45.5
More than college	41	21.7
Occupation of Mother		
Unemployed	50	26.5
Farmers	63	33.3
Worker	33	17.5
Officer	36	19
Student	7	3.7

Table 3: Nutrient Adequacy Ratios(NARs) of child aged 12-23 months

Nutrient	Intake	Recommended nutrient intake (RNI)	Nutrient adequacy ratio (NAR)
	Median (Q1, Q3)		Median (Q1, Q3)
Macronutrient			
Energy (Kcal)	88.76(69.10, 106.46)	82 Kcal/kg/day	1.09(0.85,1.39)
Carbohydrate (g)	114.94(90.11, 152.81)	130g/kg/day	0.88(0.69,1.17)
Protein (g)	3.28(2.42, 4.30)	1.05g/kg/day	3.12(2.31, 4.09)
Micronutrient			
Vitamin A (µgRE)	401.3 (145.44, 589.28)	285.71 (µgRE/day)	0.52(0.22, 0.92)
Vitamin C (mg)	29.7(4.12, 37.6)	30 mg/day	0.55(0.14, 1.210
Vitamin B1/Thiamine	0.48(0.23, 0.59)	0.5 mg/d	0.83(0.47, 1.19)
Vitamin-B12/ Riboflavin	0.93(0.28, 1.52)	0.5 mg/d	1.31(0.58, 3.04)
Vitamin B6	0.18(0.05, 0.24)	0.5 mg/d	0.25(0.10, 0.47)
Iron (mg)	4.30(2.9, 6.0)	11.6 mg/day	0.37(0.25, 0.51)
Zinc (mg)	3.12(2.08, 4.94)	8.3 mg/day	0.37(0.25, 0.59)
Calcium (mg)	400.10(111.5, 640.5)	500 mg/day	0.43(0.22, 1.28)

Table 2: Infant and young child feeding (IYCF) practices of child aged 12–23 months (n=189)

Variable	Number	Percentage
Ever been breastfed	173	91.5
Timing of breastfeeding initiation (n=173)		
Within first 1 hour	127	73.4
Currently breastfeeding	34	19.7
Duration of breastfeeding (n=139)		
> 12 months	56	40.3
Age of child when liquid/solid foods introduced		
6 months	98	51.9

Photos during data collection

Conclusion

- While children have relatively good intake of macronutrients, their intake of micronutrients is less adequate, particularly for iron, zinc, calcium, and vitamins A, B6, and C
- Many children may face multiple micronutrient deficiencies
- Interventions are needed to improve infant and young child feeding practices to improve nutrient intakes

Acknowledgements

Sincere appreciation goes to the Applied Nutrition Research Capacity Building (ANRCB) Project. Special acknowledgement is extended to Dr. Gerald Shively, Associate Dean and Director International Programs in Agriculture, Purdue University, for his input and support. This work was made possible through support from USAID as a supplement to a USAID Cooperative Agreement #7200AA18CA00009 (LASER-PULSE) to Purdue University. Contents reflect the views of the authors and do not necessarily reflect those of USAID.

References

1. MoH Laos, & World Food Programme. (2017). Fill the Nutrient Gap Lao PDR Full Report. Available at: https://docs.wfp.org/api/documents/WFP-0000023270/download/Save Children. (2013). Health and Nutrition: Laos. Available at: https://laos.savethechildren.net/what-we-do/health-and-nutrition

This work is made possible through support from USAID as a supplement to a USAID Cooperative Agreement #7200AA18CA00009 (LASER-PULSE) to Purdue University. Contents reflect the views of the author(s) and do not necessarily reflect those of USAID. For more information, please contact Catholic Relief Services Laos.