

Original Article

The impact on child wasting of a capacity building project implemented by community and district health staff in rural Lao PDR

Benjamin Coghlan MBBS¹, Michael J Toole MBBS¹, Niramongh Chanlivong BMH², Sengchanh Kounnavong PhD³, Kongchay Vongsaiya MPH², Andre Renzaho PhD⁴

¹Centre for International Health, Burnet Institute, Melbourne, Australia

²Centre for International Health, Burnet Institute, Vientiane, Lao PDR

³National Health Research Coordination Office, Institute of Public Health, Ban Kaognot, Sisattanak District, Vientiane Capital, Lao PDR

⁴Migration, Social Disadvantage, and Health Programs, International Public Health Unit, Department of Epidemiology & Preventive Medicine, Monash University, Melbourne, Australia

Laos is a low-income food-deficit country with pockets of high levels of wasting in the highland areas. We implemented a 3-year health/nutrition project in 12 villages in the highlands of Savannakhet province to reduce acute malnutrition in children. Volunteer nutrition teams in each village monitored child growth and promoted healthy feeding practices; a multisectoral district committee conducted monthly outreach to assess child growth, manage acute malnutrition and deliver primary health care services. We conducted a cross-sectional assessment before project activities began and at the end of the project. The baseline survey randomly sampled 60% of all households; the endline assessment aimed to survey all eligible registered participants. Anthropometric measures were taken from children aged 6-59 months; mothers with children aged <12 months were asked about infant feeding practices, antenatal and post-partum care; and child immunizations were recorded for children aged between 0-23 months. At baseline, 721 households were sampled, while the endline assessment surveyed between 82% and 100% of eligible participants in each age group. Acute malnutrition reduced from 12.4% (95% CI: 10.4-14.3) to 6.1% (4.9-7.3). Unhealthy feeding practices declined: in 2008, 40.0% (34.7-45.3) of mothers breastfed their newborn within 2 hours of birth and 30.8% (25.7-35.8) threw the colostrum away; in 2011, these figures were 72% and 8% respectively. Maternal care and child immunisation coverage also improved. Improving the health environment and child feeding practices appears to have markedly reduced the level of wasting. Unsafe feeding practices were common but readily changed by the community-based nutrition teams.

Key Words: wasting, acute malnutrition, Laos, capacity-building, feeding behaviours

INTRODUCTION

The Food and Agricultural Organization of the United Nations classifies Lao PDR as a low-income food-deficit country;¹ it is both poor and a net importer of food with the lowest proportion of arable land in Southeast Asia.² Nationally, 6% of children are acutely malnourished³ with pockets of much higher levels of wasting, particularly in the highland areas of southern provinces.⁴ The National Nutritional Policy (2008), the first official government plan to tackle undernutrition, notes that the level of malnutrition has not declined with recent economic growth.⁵ This document outlines a range of strategic principles to achieve a steady reduction in malnutrition in 2020, including increased bottom-up planning and implementation at the provincial and district levels, and the prioritisation of groups living in remote upland areas.⁵

Consistent with this policy, the Burnet Institute implemented a health and nutrition project in 12 villages in Vilabouly district in the remote southern highlands of Savannakhet province from August 2008 to December

2011. At this time, government activities related to the National Nutritional Policy had not been implemented in this district. Residents in Vilabouly rely on subsistence farming, foraging and hunting, and food shortages are an annual concern. Our project aimed to reduce acute malnutrition in children through the establishment of volunteer community nutrition teams in each village to monitor child growth and promote healthy infant feeding practices and child diets. A multisectoral district committee was trained to support these teams with monthly outreach to formally assess child growth and to manage severe acute

Corresponding Author: Dr Benjamin Coghlan, Centre for International Health, Burnet Institute, 85 Commercial Rd, Melbourne, Australia 3004.

Tel: +61 3 9282 2177; Fax: +61 3 9282 2144

Email: coghlan@burnet.edu.au

Manuscript received 26 February 2013. Initial review completed 21 April 2013. Revision accepted 12 October 2013.

doi: 10.6133/apjcn.2014.23.1.16

malnutrition in children. Outreach also aimed to increase immunization coverage, teach mothers how to manage children with diarrhoea, improve access to antenatal and postnatal care, and promote family planning.

The 12 villages were near a large gold and copper mine operated by MMG LXML Sepon who financed the project.⁶ The mine also supported separate contemporaneous initiatives to improve the health of local residents: they established a regular water supply to all villages over the 3 years, installed pit latrines to about 50% of households, and set up a village banking mechanism that enabled a handful of residents to start small-scale agricultural businesses.

We report on changes in key health indicators over the course of the project.

Methods

Intervention

The District Governor inaugurated a *Project Management Committee* in the first year of the project to oversee the planning, implementation and monitoring of the project. Led by the governor and with representatives from all local government departments including the Health and Education Departments, the Lao Youth and Women's Union, and the District Hospital, the committee received training in project management and monitoring and evaluation. They met every two months and assigned staff to conduct monthly outreach to all villages to provide antenatal and postpartum care, deliver immunizations, supplements and contraceptives, run health promotion activities, and collect anthropometric measurements of children.

Community nutrition teams were formed in each village and composed of three volunteers: the village head, the Lao Women's Union representative and the village health worker. They received initial and annual refresher training on safe breastfeeding practices and weaning; the food groups, micronutrients and how to diversify diets using locally available foods; how to conduct cooking exhibitions including demonstrating safe food preparation and storage; child growth monitoring; and home management of malnourished children. These teams actively promoted and modelled good nutrition practices in their village throughout the year and ran the monthly outreach activities in partnership with local health staff. A joint meeting of all nutrition teams and the Project Management Committee was held each quarter to report on progress.

District hospital and local health clinic staff received training from provincial and central staff on the management of severe acute malnutrition and common infectious diseases; immunisation and micronutrient supplements; family planning; and antenatal, delivery and postnatal care.

Burnet Institute staff supported the committee to manage the project, and financed the trainings and outreach activities; no incentives were provided to staff or community volunteers. Each year Burnet staff formally observed outreach activities and conducted focus group discussions with the nutrition teams and mothers with children aged less than five years to identify problems and improve the quality of activities for the following year.

Assessments

We conducted a cross-sectional assessment before project activities began and at the end of the project.

Baseline

During the baseline study in 2008, we mapped all households in each village and randomly selected 60% to survey. This approach aimed to give a precision of 5% or better for the measurement of all project indicators, as well as generating maps useful for the delivery of project activities. In each household, the height/length and weight of all children aged between 6 and 59 months were measured using UNICEF nutrition kits; mothers with children aged less than 12 months were asked about infant feeding practices and antenatal and post-partum care using a standard questionnaire; and child immunizations listed on the national Extended Programme of Immunization schedule were recorded for children aged between 0-23 months. The anthropometric assessment of children did not include an examination for bilateral leg oedema because the surveyors lacked clinical skills.

End of project

The sampling strategy for the end of project assessment in 2011 differed from the baseline and was a pragmatic alternative to minimise disruption to the final outreach visits of the project: women were interviewed and child nutritional status assessed as they attended outreach. Each outreach visit was promoted in advance to encourage attendance, and surveyors were assigned to trace eligible, registered participants who did not attend aiming for a complete census of beneficiaries. Nutrition teams updated the registers of women and children before each monthly outreach so we had complete lists of all eligible women and children at the time of the end of project assessment.

Study team

Surveyors were staff assigned by district departments of agriculture, education, propaganda, and information and culture, as well as the local women's and youth unions, and the district gardening group. Interviewers received standardized training for four days including practical field exercises. Senior Burnet Institute staff supervised data collection in all villages and two doctors from the Faculty of Medical Sciences, National University of Laos, oversaw the child anthropometry.

Data analysis

Data were double entered into EpiData v3.1 and analysed with STATA v10.1. We used the WHO Child Growth Standards (2006)⁷ derived from the WHO multi-centre growth reference study⁸ to determine the nutritional status of children and to exclude extreme values suggestive of an error in measuring or recording the height/length or weight. Confidence intervals for baseline figures took account of the survey design including the application of the finite population correction factor because the sample size was large relative to the total population. Since the end of project assessment used a non-random sampling method, we took into account children who were not sampled to calculate minimum and maximum values for each measure to allow comparisons with the baseline

Table 1. Number of people by subpopulation sampled during the baseline survey and end of project assessment

Subpopulation	Baseline survey	End of project assessment	
	Number sampled	Number sampled	Proportion of subpopulation sampled
Children aged 6-59 months	453	847	82%
Children aged 0-23 months	252	385	99%
Children aged 12-23 months	119	205	89%
Mothers with children aged <12 months	131	180	100%

study. For instance, a *minimum estimate* for the prevalence of wasting (low weight for height/length) at the end of the project assumed that all children not surveyed were well nourished; a *maximum estimate* assumed that missed children had a prevalence of malnutrition equal to that observed in the baseline survey. No adjustments have been made to account for repeated measures of some children in both the baseline and end of project assessments.

Ethical issues

The University of Health Sciences Ethics Committee, Vientiane, Lao PDR and the Alfred Health Human Ethics Committee, Melbourne, Australia both approved the research. Each village head was contacted in advance of the assessments and permission sought to conduct the survey in their village. Individual verbal informed consent was sought from each participant or his or her guardian when the participant was a minor.

RESULTS

During the baseline survey, we visited 721 households (60% of the total number of households in the 12 villages). Twenty-four households (10.4% of visited households) were replaced with residents of the next nearest house as no one was home on the day of the survey. The end of project assessment sampled a high proportion of the total (registered) subpopulation during the final outreach activities (Table 1). There were no refusals in the baseline or end of project studies.

Acute malnutrition (wasting) in children

The baseline survey documented a high level of acute malnutrition among children aged 6-59 months: almost one in 20 children was severely wasted and one in eight was moderately or severely wasted when compared to the WHO reference population (Table 2). There was a pronounced decline in the prevalence of wasting at the end of the project even when assuming that children missed dur-

ing the end of project assessment were as malnourished as children at the time of the baseline survey (see maximum estimates in Table 2).

Infant feeding

Almost all women interviewed in 2008 and 2011 breastfed their child. Traditional practice, however, was to dispose of 'first milk' (colostrum) because it was believed to be harmful with consequent delaying of the first feed: in 2008 only 40.0% (95% CI: 34.7-45.3%) of mothers breastfed their newborn within 2 hours of birth and 30.8% (25.7-35.8%) threw the colostrum away. In contrast, 92% of women who delivered during the last year of the project fed their baby colostrum and 72% initiated feeding within 2 hours of delivery.

Exclusive breastfeeding was uncommon before the project with a strong tradition of feeding infants pre-masticated glutinous rice: rice is chewed by the mother, grandmother or older sibling and placed directly in the baby's mouth. Three-quarters of the mothers (75.4%; 95% CI: 71.0-79.8%) fed children aged less than one-month solid food (usually rice), while 90.8% (87.6-93.9%) gave (untreated) water. In 2011, only 22% of mothers continued to give solid food to infants within a month of delivery; 46% still gave water.

Other health care indicators

At the end of the project, minimum estimates for coverage of other health activities were all well above the upper limit of the 95% confidence interval measured during the baseline survey (Table 3), signalling improvements across the continuum of care for maternal, newborn and child health services.

DISCUSSION

The underlying causes of malnutrition have broadly been attributed to a poor health environment, poor social and caring behaviours, and/or food insecurity.⁹ This health and nutrition project was successful in improving the

Table 2. Comparison of the prevalence of acute wasting (low weight for height according to the WHO reference population) for children aged 6 to 59 months in the baseline survey with the end of project assessment

Assessment	Children sampled (n)	Children not sampled		Level of wasting	
		Missed (n)	Excluded due to extreme values (n)	Moderate + severe (< -2 z-scores)	Severe (< -3 z-scores)
Baseline (95% CI)	445	§	8	12.4% (10.4-14.3)	4.5% (3.3-5.7)
End of project (Min [†] - Max [‡])	825	192	10	6.1% (4.9-7.3)	1.0% (0.8-1.7)

[†] Minimum estimate of the population level of acute wasting assumes that none of the children aged 6-59 months who were not sampled (or excluded) were moderately or severely wasted

[‡] Maximum estimate of the population level of acute wasting assumes that children aged 6-59 months who were not sampled (or excluded) were moderately or severely wasted at the level observed at baseline

[§] 10.4% of households were replaced with the next nearest household

Table 3. Change in health indicators from baseline (2008) to the end of the project (2011)

Subpopulation	Period	Health indicator	Coverage of health indicator	
			Baseline (%) (95% CIs)	End of project (%) (Min-Max)
Mothers with children aged <12 months	Antepartum	1 or more visits by a skilled health professional	69.5 (65.1-73.8)	88 [†]
		4 or more visits by a skilled health professional	32.1 (27.4-36.7)	53 [†]
		Given iron-folic acid supplements	55.7 (50.8-60.7)	86 [†]
		Given vitamin B-1	0	76 [†]
		Protected from tetanus (received 2 doses during last pregnancy or 3+ doses ever)	38.2 (33.0-43.4)	79 [†]
	Delivery	Delivered at the district hospital	38.2 (33.3-43.0)	52 [†]
		Delivered at home	52.6 (47.5-57.8)	39 [†]
		Delivery attended by a skilled birth attendant	51.9 (46.8-57.0)	62 [†]
	Postpartum	Given iron-folic acid supplements	0	47 [†]
		Received vitamin A	0	43 [†]
Received vitamin B-1		0	54 [†]	
Children aged 0-23mths	Early childhood	Bacillus Calmette-Guérin vaccine (BCG) (given at birth)	62.3 (58.5-66.1)	82.9 (82.4-82.9) [‡]
Children aged 12-23mths	Early childhood	Measles vaccine (given 9-11mths)	31.1 (25.8-36.4)	87.0 (69.7-89.6) [§]
		Given 1 dose of vitamin A (between 6-23mths)	31.1 (25.8-36.4)	62.0 (55.0-66.2) [§]
		Given 2 doses of vitamin A (between 6-23mths)	26.1 (20.9-31.2)	42.9 (38.1-49.4) [§]
		Given deworming tablet (between 12-23mths)	28.6 (23.2-34.0)	53.7 (47.6-58.9) [§]

[†] 100% of eligible, registered subpopulation sampled (n=180)

[‡] 99% of eligible, registered subpopulation sampled (n=385)

[§] 89% of eligible, registered subpopulation sampled (n=205)

health environment via improved coverage of health care during pregnancy, delivery, post-partum and early childhood, and improving aspects of child caring behaviours and food utilization by changing unhealthy traditional child feeding practices. A marked reduction in the prevalence of acute malnutrition was seen among children in the twelve highland villages, although the study design does not allow us to disentangle the impact of our project on childhood wasting from other health activities of the mine or broader concomitant environmental and socio-economic changes. Importantly, the reduction in wasting prevalence was achieved without altering local food availability and food access: there was no mass distribution of supplemental food, direct agricultural interventions or widespread income generating activities, though the mine did support a small-scale banking mechanism to stimulate agricultural businesses. Arguably, this emphasises the potential benefits for child nutrition of focusing on care behaviours, and health rather than exclusively on food.¹⁰

Feeding practices may be especially important determinants of child nutritional status in this context: previous Lao studies have highlighted harmful traditional infant feeding practices across ethnic groups, such as feeding newborns chewed rice and the disposal of colostrum because of the belief that it is unsafe,¹¹⁻¹⁴ and linked these behaviours to (chronic) malnutrition.¹² Exclusive breastfeeding until 6 months of age is considered the most important preventive intervention for child mortality,¹⁵ while a study in rural Thailand found there was a reduction in total protein intake for newborns fed glutinous rice.¹⁶ Our project demonstrates that these customary behaviours were not entrenched, and that women were open to adopting safer infant feeding practices.

The way in which health messages are delivered, however, may be important. A randomised controlled trial from Brazil found that adding community promotion of exclusive breastfeeding was more effective at sustaining behaviour change than hospital-based delivery alone;¹⁷ Lao studies have noted the influence of family advice on exclusive breastfeeding and that involving fathers leads to higher breastfeeding rates.^{14,18} While women's education has been shown to be the most important underlying determinant of child malnutrition in multi-country assessments,¹⁹ the father's level of education exhibits a stronger effect on child wasting in Laos.²⁰ Our project used influential local male and female volunteers to promote healthy nutrition practices through cooking demonstrations, videos, modelling good practice, and growth monitoring rather than just providing education. Mothers, fathers and grandparents were engaged in discussions about child feeding specifically, and about child and maternal health more broadly.

While this was not a comprehensive primary health care approach per se, the project did utilise a number of elements integral to effective primary health care:²¹ links between health services and the community were reinforced with monthly outreach by health staff from health centres and the district hospital to even the most remote villages; nutrition activities were integrated with local health services; each village selected volunteers for the nutrition teams who directly liaised with the inter-sectoral project management committee. This approach stimulated community interest in an issue not initially considered important by villagers despite a baseline level of wasting indicative of a 'serious' nutrition situation according to both the United Nations Standing Committee on Nutrition (wasting prevalence >10%)²² and the World Health Organization (10-14%).²³

The health and nutrition project, however, did not have a direct link with other local development activities of the mine, potentially missing opportunities for joined-up action.²⁴ This is particularly the case for water and sanitation, which in Laos is the responsibility of the district health office. Similarly, while agricultural department and district gardening group staff sat on the management committee, nutrition activities of the project were not explicitly connected to their work.

Study limitations

The end of project assessment did not employ a standard cross-sectional survey because of the need to combine data collection with the delivery of activities. Nonetheless, comparable data were collected demonstrating an alternative to surveys to monitor the coverage and impact of small projects delivered to small populations, a valuable consideration given the historical challenges of implementing quality nutritional assessments.²⁵ In this situation, surveyors and the local people more easily understood the census approach used for the end of project assessment than the random sampling that was employed during the baseline survey.

While serial cross-sectional assessments are often employed by community projects in developing countries, they offer weak evidence of causality. This is an important limitation when trying to determine the relative contributions of different health and agricultural interventions on levels of undernutrition. Important proximal determinants of nutrition such as the incidence and management of infectious diseases and actual dietary intake are not well captured by cross-sectional surveys, and other influencing factors such as maternal health, foetal growth, hygiene practices and the small-scale interventions implemented by the mine were not recorded and accounted for in our analysis. Similarly, we did not account for the fact that some children will have been measured in the baseline and endline studies, an unstated potential problem of any serial cross-sectional surveys for children aged 6-59 months with less than five years between studies. Also, we do not have trend data of the prevalence of wasting among children from before the project began or throughout the year to know if the levels we documented were unusual for the setting or the time of year.

Conclusion

The combination of strengthening primary health care services and community based nutritional interventions using the existing structure of health services and function of health actors (including community volunteers) was successful in addressing acute malnutrition in this food-insecure area of rural Laos. Prospective studies, ideally randomised and combined with economic assessments, are needed to provide stronger evidence of the impact of these interventions on child wasting and their sustainability within an under-resourced health sector. The longer-term impact on chronic measures of undernutrition also needs to be rigorously assessed.

ACKNOWLEDGEMENTS

We wish to thank LXML whose assistance enabled this community project to go ahead; the District Governor who established and led the project committee; the Provincial Health Director and the Head of the Vilabouly District Health Office who provided personnel to assist with outreach services; the Faculty of Medical Sciences, National University of Laos, who supervised the anthropometric assessments; and the district multi-sectoral project working team and the communities themselves who gave up their time to deliver the health and nutrition activities our project supported. The authors also gratefully acknowledge the contribution to this work of the Victorian Operational Infrastructure Support Program.

AUTHOR DISCLOSURES

We have no conflicts of interest. MMG LXML Sepon funded the project.

REFERENCES

1. Food and Agricultural Organization of the United Nations. Special Programme for Food Security: Low-income food-deficit countries. Food and Agricultural Organization of the United Nations; 1996. [cited 2012/1/7]; Available from <http://www.fao.org/FOCUS/E/SpeclPr/LIFDCs.htm>
2. USDA-FAS. Commodity Intelligence Report. Laos: Sustainability of Future Rice Production Growth and Food Security Uncertain. United States Department of Agriculture; 2011. [cited 2012/1/7]; Available from http://www.pecad.fas.usda.gov/highlights/2011/12/Laos_13Dec2011/
3. Ministère de la santé Lao PDR. National Nutrition Strategy and Plan and Action 2010-2015. Vientiane: Ministry of Health; 2009.
4. World Food Programme Lao PDR. WFP Lao PDR Country Strategy, 2011-2015. Vientiane: WFP; 2011.
5. Ministry of Health Lao PDR. National Nutrition Policy. Vientiane: Ministry of Health; 2008.
6. MMG Limited. Mother and child health. MMG Limited; 2012. [cited 2012/1/7]; Available from <http://www.mmg.com/en/Our-Operations/Mining-operations/Sepon/Living-in-the-community/Community-programs/Mother-and-child-health.aspx>
7. World Health Organization. WHO Child Growth Standards: Methods and development: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age. Geneva: WHO; 2006.
8. de Onis M, Garza C, Victora CG, Onyango AW, Frongillo EA, Martines J. The WHO Multicentre Growth Reference Study: planning, study design, and methodology. *Food Nutr Bull.* 2004;1(Suppl):S15-26.
9. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet.* 2008;9608:243-60. doi: 10.1016/S0140-6736(07)61690-0
10. Haddad L. Lifting the curse: overcoming persistent undernutrition in India. *IDS Bulletin.* 2009;4:1-8. doi: 10.1111/j.1759-5436.2009.00052.x
11. Holmes W, Hoy D, Lockley A, Thammavongxay K, Bounnaphol S, Xeuatvongsa A, Toole M. Influences on maternal and child nutrition in the highlands of the northern Lao PDR. *Asia Pac J Clin Nutr.* 2007;3:537-45.
12. Barennes H, Simmala C, Odermatt P, Thaybouavone T, Vallee J, Martinez-Aussel B, Newton PN, Strobel M. Postpartum traditions and nutrition practices among urban Lao women and their infants in Vientiane, Lao PDR. *Eur J Clin Nutr.* 2009;3:323-31. doi: 10.1038/sj.ejcn.1602928
13. Food and Agricultural Organization of the United Nations, IUCN – the World Conservation Union. The role and

- nutritional value of aquatic resources in the livelihoods of rural people: a participatory assessment in Attapeu Province, Lao PDR. Bangkok: Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific; 2003.
14. Putthakeo P, Ali M, Ito C, Vilayhong P, Kuroiwa C. Factors influencing breastfeeding in children less than 2 years of age in Lao PDR. *J Paediatr Child Health*. 2009;9:487-92. doi: 10.1111/j.1440-1754.2009.01547.x
 15. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS. How many child deaths can we prevent this year? *Lancet*. 2003;9377:65-71. doi: 10.1016/S0140-6736(03)13811-1
 16. Valyasevi A, Halstead SB, Pantuwatana S, Tankayul C. Studies of bladder stone disease in Thailand. IV. Dietary habits, nutritional intake, and infant feeding practices among residents of a hypo- and hyperendemic area. *Am J Clin Nutr*. 1967;12:1340-51.
 17. Coutinho SB, de Lira PI, de Carvalho Lima M, Ashworth A. Comparison of the effect of two systems for the promotion of exclusive breastfeeding. *Lancet*. 2005;9491:1094-100. doi: 10.1016/S0140-6736(05)67421-1
 18. Barennes H, Empis G, Quang TD, Sengkhamyong K, Phasavath P, Harimanana A, Sambany EM, Koffi PN. Breast-milk substitutes: a new old-threat for breastfeeding policy in developing countries. A case study in a traditionally high breastfeeding country. *PLoS one*. 2012;2:e30634. doi: 10.1371/journal.pone.0030634
 19. Smith LCH, L. Explaining child malnutrition in developing countries: a cross-country analysis. Washington, DC:International Food Policy Research Institute; 2000.
 20. Kamiya Y. Socioeconomic determinants of nutritional status of children in Lao PDR: effects of household and community factors. *J Health Popul Nutr*. 2011;4:339-48. doi: 10.3329/jhpn.v29i4.8449
 21. Walley J, Lawn JE, Tinker A, de Francisco A, Chopra M, Rudan I, Bhutta ZA, Black RE. Primary health care: making Alma-Ata a reality. *Lancet*. 2008;9642:1001-7. doi: 10.1016/S0140-6736(08)61409-9
 22. Standing Committee on Nutrition. Nutrition Information in Crisis Situations. United Nations System Standing Committee on Nutrition Report No 3. Geneva: UNSCN; 2004.
 23. World Health Organization. The management of nutrition in major emergencies. Malta: WHO; 2000.
 24. Lawn JE, Rohde J, Rifkin S, Were M, Paul VK, Chopra M. Alma-Ata 30 years on: revolutionary, relevant, and time to revitalise. *Lancet*. 2008;9642:917-27. doi: 10.1016/S0140-6736(08)61402-6
 25. Spiegel PB, Salama P, Maloney S, van der Veen A. Quality of malnutrition assessment surveys conducted during famine in Ethiopia. *JAMA*. 2004;5:613-8. doi: 10.1001/jama.292.5.613

Original Article

The impact on child wasting of a capacity building project implemented by community and district health staff in rural Lao PDR

Benjamin Coghlan MBBS¹, Michael J Toole MBBS¹, Niramonth Chanlivong BMH², Sengchanh Kounnavong PhD³, Kongchay Vongsaiya MPH², Andre Renzaho PhD⁴

¹Centre for International Health, Burnet Institute, Melbourne, Australia

²Centre for International Health, Burnet Institute, Vientiane, Lao PDR

³National Health Research Coordination Office, Institute of Public Health, Ban Kaognot, Sisattanak District, Vientiane Capital, Lao PDR

⁴Migration, Social Disadvantage, and Health Programs, International Public Health Unit, Department of Epidemiology & Preventive Medicine, Monash University, Melbourne, Australia

由社區和地區保健人員在寮國鄉村實施健康能力建構計畫對兒童發育不良的影響

寮國是一個低收入且糧食缺乏的國家，特別在高原地區營養不足情況嚴重。在沙灣拿吉省高地的 12 個村莊，實施一項為期三年的健康營養計畫，目的是減少此地區的兒童急性營養不良。各村莊的營養志工團隊監測兒童成長及推動健康哺餵。多部門地區委員會每月巡迴各村莊，評量兒童生長情形、處置急性營養不良與提供初級健康照護保健服務。在計畫執行前後分別進行一項橫斷型評估。基線評估是隨機抽取 60% 家戶；而終線評估目標是調查所有合格登記的參與者。6-59 月的兒童進行體位測量；詢問有 12 個月以下兒童的母親，其哺餵嬰兒的方式、產前與產後之照護；記錄 0-23 月兒童的疫苗接種情況。基線取樣 721 個家戶；而終線評估在不同年齡組有 82%-100% 參與者被調查。急性營養不良由 12.4% (95% CI: 10.4-14.3) 減少至 6.1% (95% CI: 4.9-7.3)。不健康的哺餵行為降低：在 2008 年，新生兒出生 2 小時內進行餵母乳的母親佔 40.4% (34.7-45.3)，而摒棄初乳的母親佔 30.8% (25.7-35.8)；在 2011 年，二者比例分別為 72% 和 8%。孕產婦保健和兒童疫苗接種的覆蓋率也提高。改善醫療衛生環境與幼兒哺餵方法，明顯降低兒童發育不良。不安全的哺餵方式雖然常見，但社區為基礎的營養團隊，能即時促以改善。

關鍵字：發育不良、急性營養不足、寮國、健康能力建構、哺餵行為