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► **To cite this version:**

Eric Bénéfice. Mothers and children nutritional status and food habits in the city of Vientiane as related to the level of urbanization. The 3rd International Conference on Public Health among Greater Mekong Sub-Regional Countries "Global Preventive Public Health Challenges among Greater Mekong Sub-Regional Countries", Aug 2011, Vientiane, Laos. ird-00614346

HAL Id: ird-00614346

<https://ird.hal.science/ird-00614346>

Submitted on 11 Aug 2011

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3rd International Conference on Public Health among Greater Mekong Sub-Regional Countries "Global Preventive Public Health Challenges among Greater Mekong Sub-Regional Countries" 9-10 August 2011, ITCT, Vientiane, Lao PDR

Mothers and Children Nutritional Status and Food Habits in the City of Vientiane as Related to the Level of Urbanization

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Background

Transitions

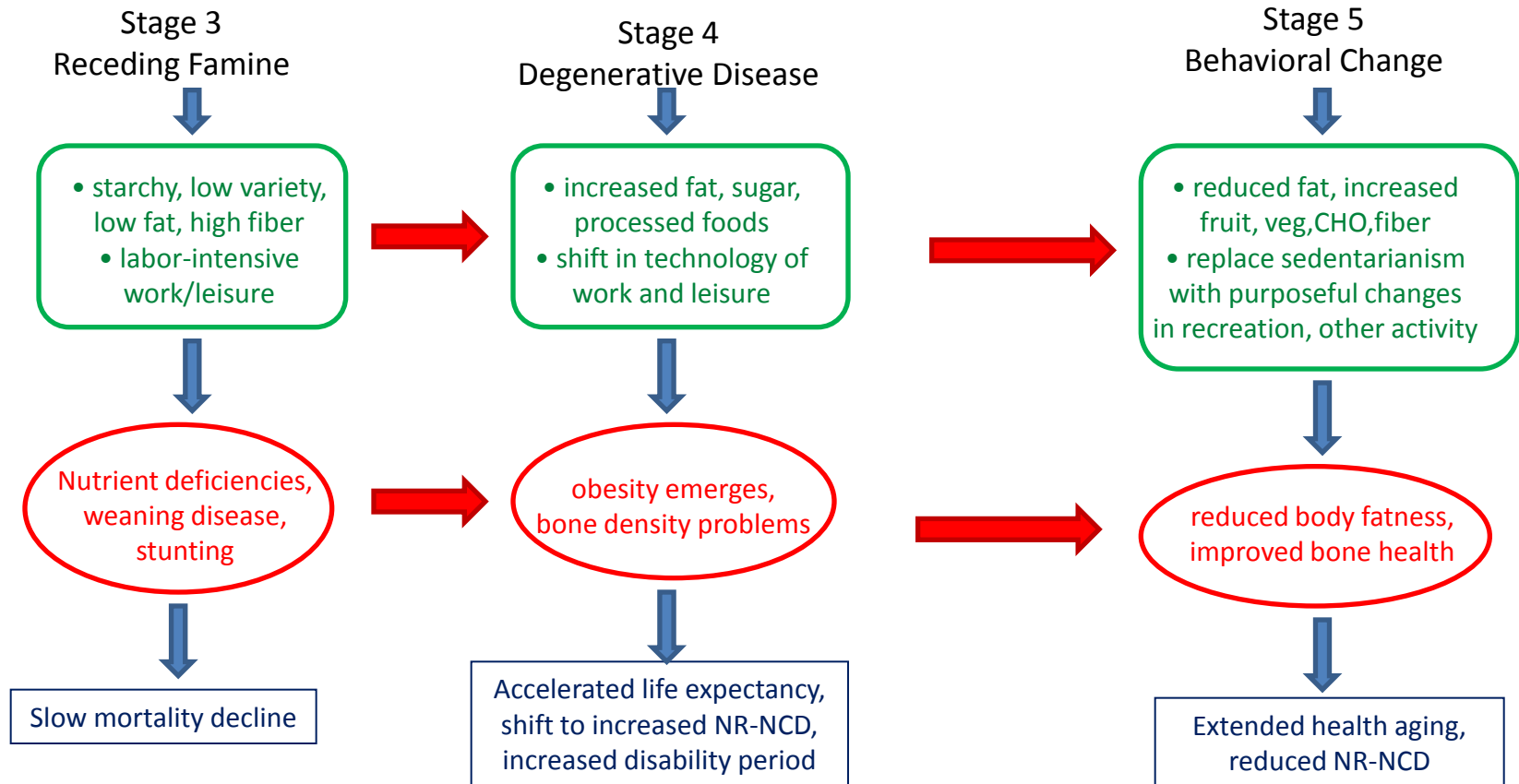
- **Demographic transition:** shift from high fertility and mortality to low fertility and mortality (Warren, 1929; Landry, 1982)
- **Epidemiological transition:** shift from a pattern of high prevalence of infectious and malnutrition, to one of high prevalence of chronic and degenerative disease associated with urban–industrial lifestyles (Omran, 1971)
- **Nutritional transition:** shifts on diet (refined food, low fiber content) and physical activity (lower levels) patterns (Popkin, 2004)

Asia

- Asian countries are undergoing a rapid pace of urbanization, industrialization, technological changes that would impact their lifestyle
 - Global improvement of health status (better access to health facilities, better knowledge...)
 - Increase in non communicable diseases (CVD, diabetes, metabolic abnormalities, obesity...)
- Many studies from China, Pakistan, India, Philippines...)
- Thailand (Vongsvat Kosulwat, 2002)

Mechanisms (*Popkin, 2004*)

Urbanization, economic growth, technological changes for work, leisure, & food processing



Transition in PDR Lao?

PDR Lao is not as urbanized as other SE Asian countries (ex Bangkok >10 million inhabitants vs Vientiane 300 000). But:

- Important economic growth (8 to 10% yearly)
- Infrastructures (roads, dams, bridges)
- Urban development (not only Vientiane)
- Improvement of medical facilities
- The part of agriculture in GNP tend to decrease



Questions

- Are signs of a nutritional transition detectable in food eating pattern and nutritional status?
- Are they related to urbanization process?

Methods

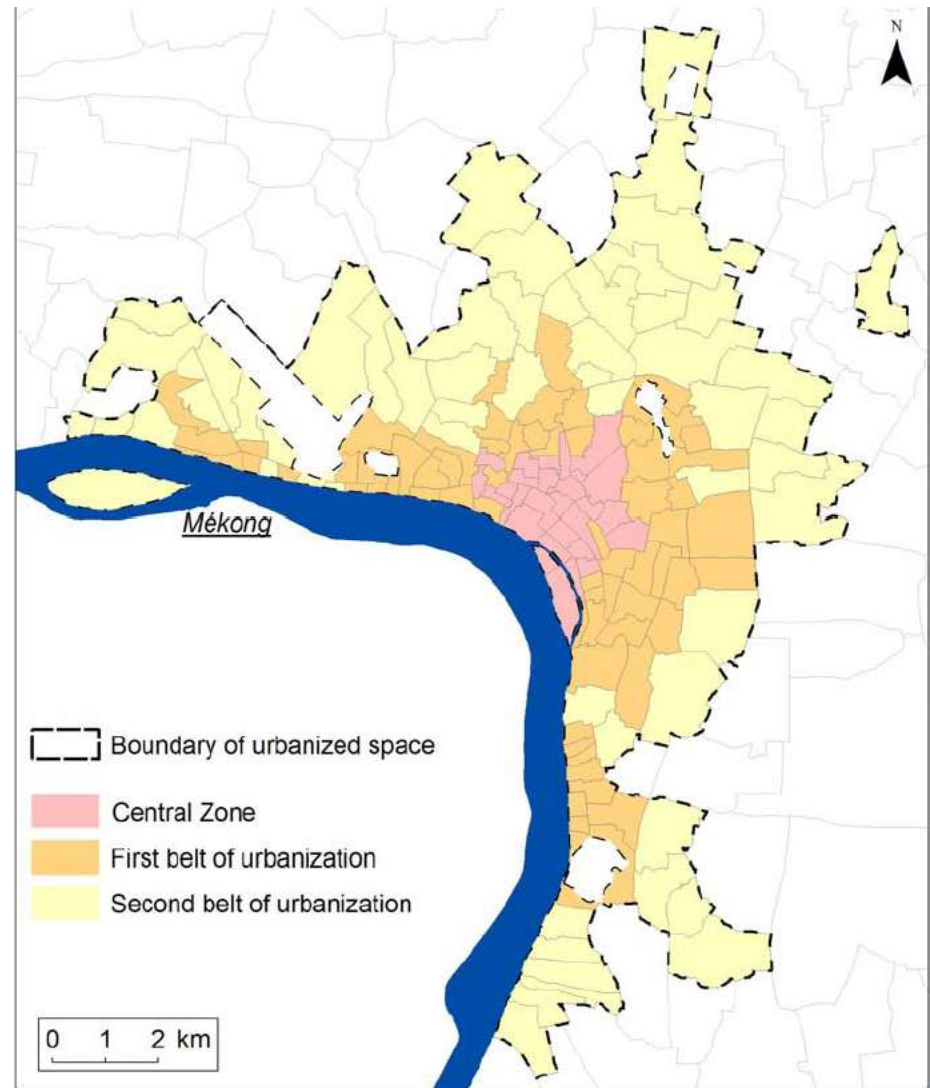
Sampling

- Spatial disparities of Vientiane (189 villages, 4 urban and 3 periurban districts)
- Determination of “urbanization level” after 13 variables representing: density, equipment, accessibility; housing; activity... from the 1995 and 2005 census (*Vallee, 2008*)
- Selection of 148 urban villages (*Hierarchical classification analyze*)
- Determination of 3 urban spaces (*Correspondence analysis with a hierarchical forward design, Vallee, 2008*)

Urban stratification

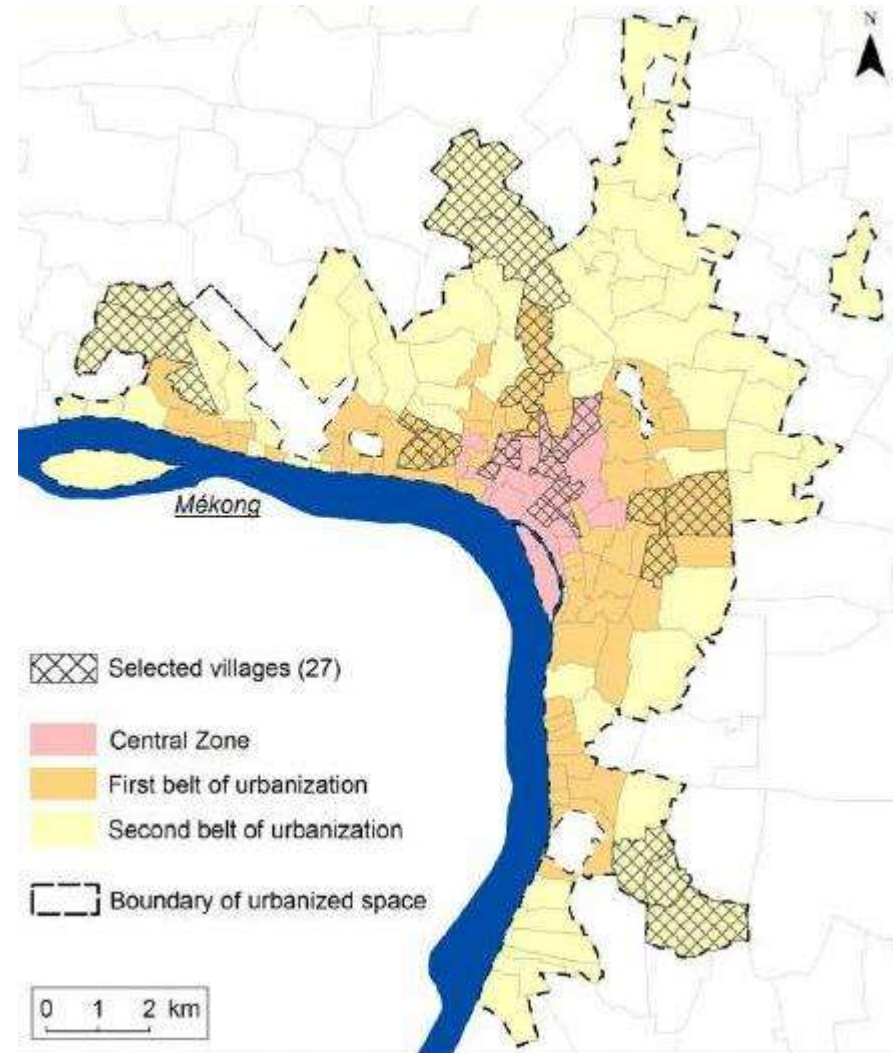
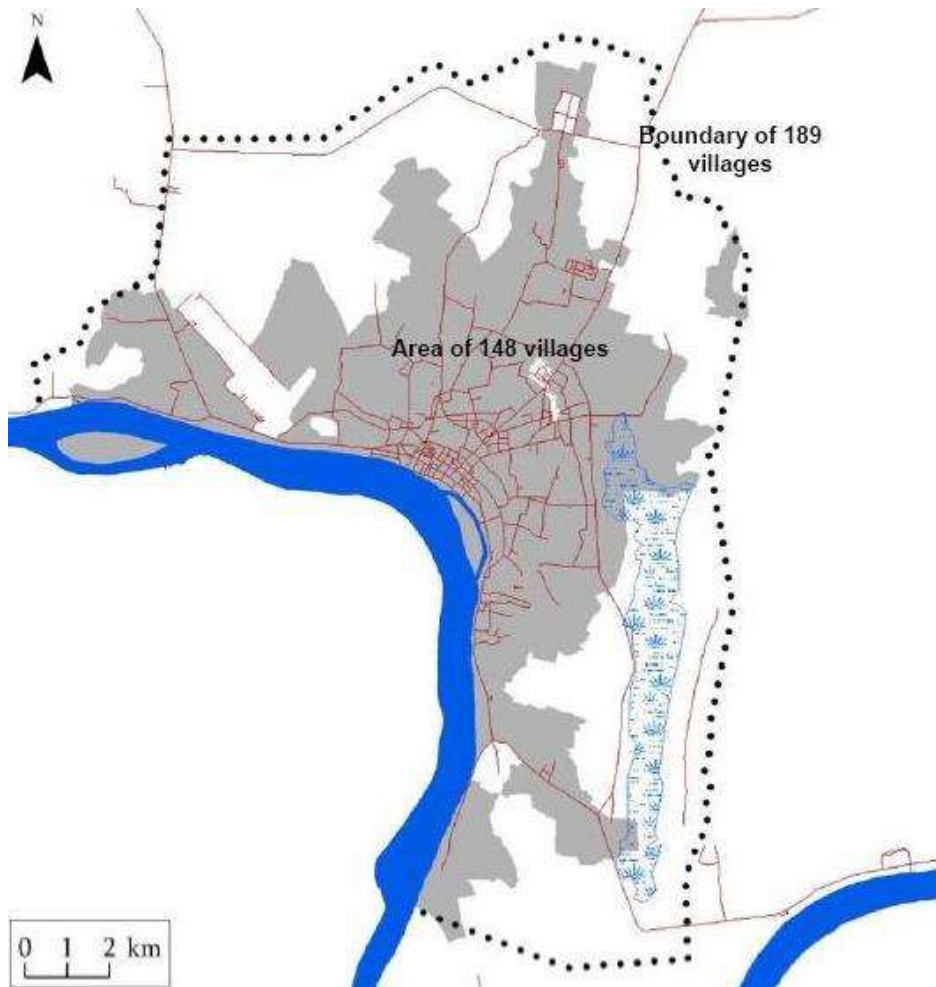
Division of 148 villages
into 3 strata:

- Central zone: 25 villages
- First belt of urbanization: 67 villages
- Second belt: 56 villages



Studied area and selected villages

(Vallee, 2008)



© Julie Vallée, IRD, 2006. Sources: Atlas Infographique de Vientiane, National Statistical Center

Subjects and methods

- Sampling: youngest , pregnant or lactating women, from the whole sample: 157 mother-child pairs
- Repeated visits: 2007, 2008 and 2009; home to home surveys
- Food consumption survey (24 hours recall and frequency questionnaire)
- Anthropometry and clinical examination



Food consumption

- Use of Nutrisurvey software (www.nutrisurvey.de)
- Compilation of data from Thai, USDA, FAO, Canadian and German data base
- Survey file: 252 entries.
- More than 100 nutrients could be analyzed. In practice analysis of 23 nutrients and energy
- Food consumption scores



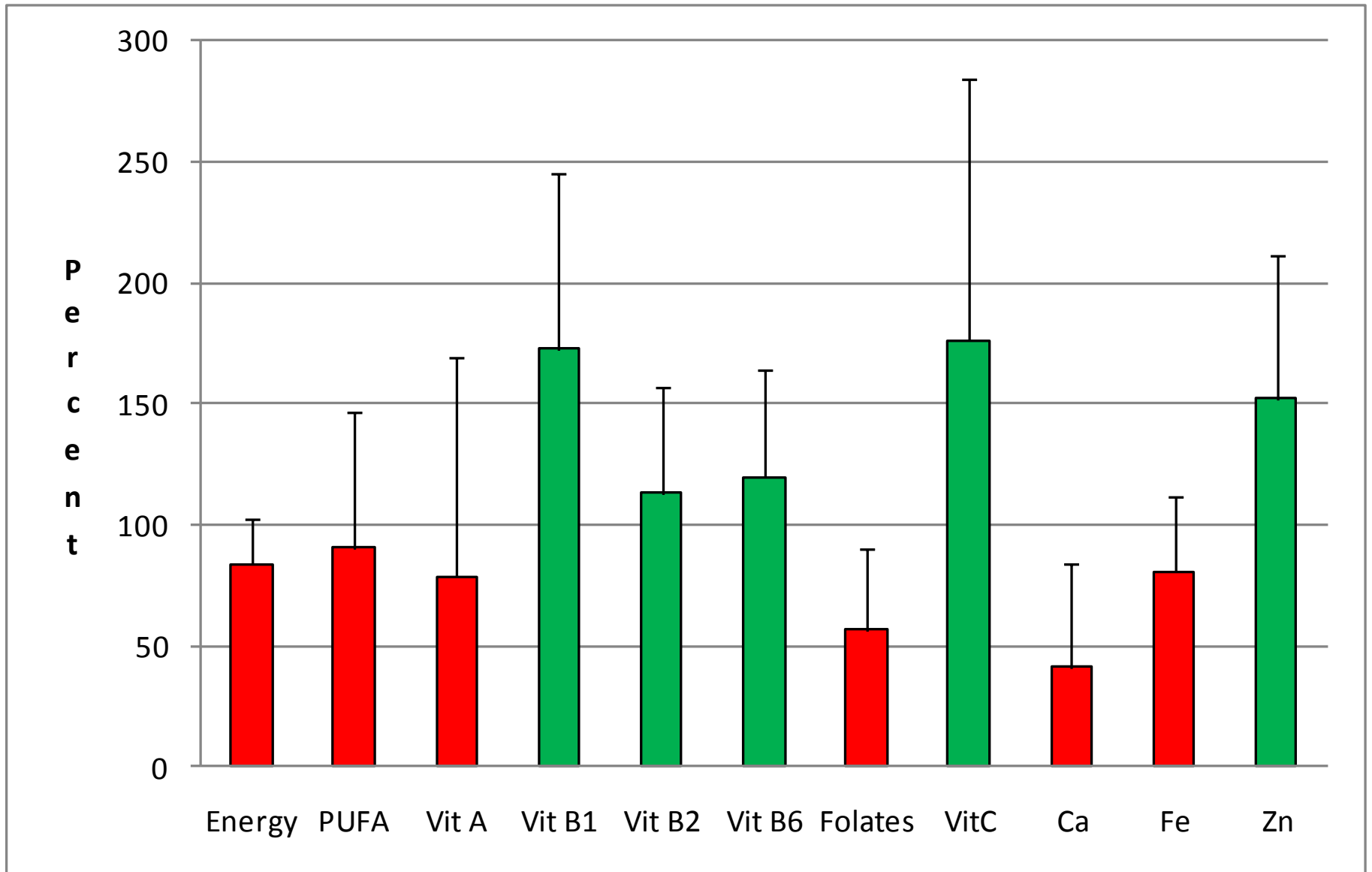
Anthropometry

- Children: Weight, length (supine), head and arm circumferences, triceps skinfold
- Mother: weight, standing and sitting height, arm circumference, 4 skinfolds (tric, bic, sub scapul, iliac)



Results

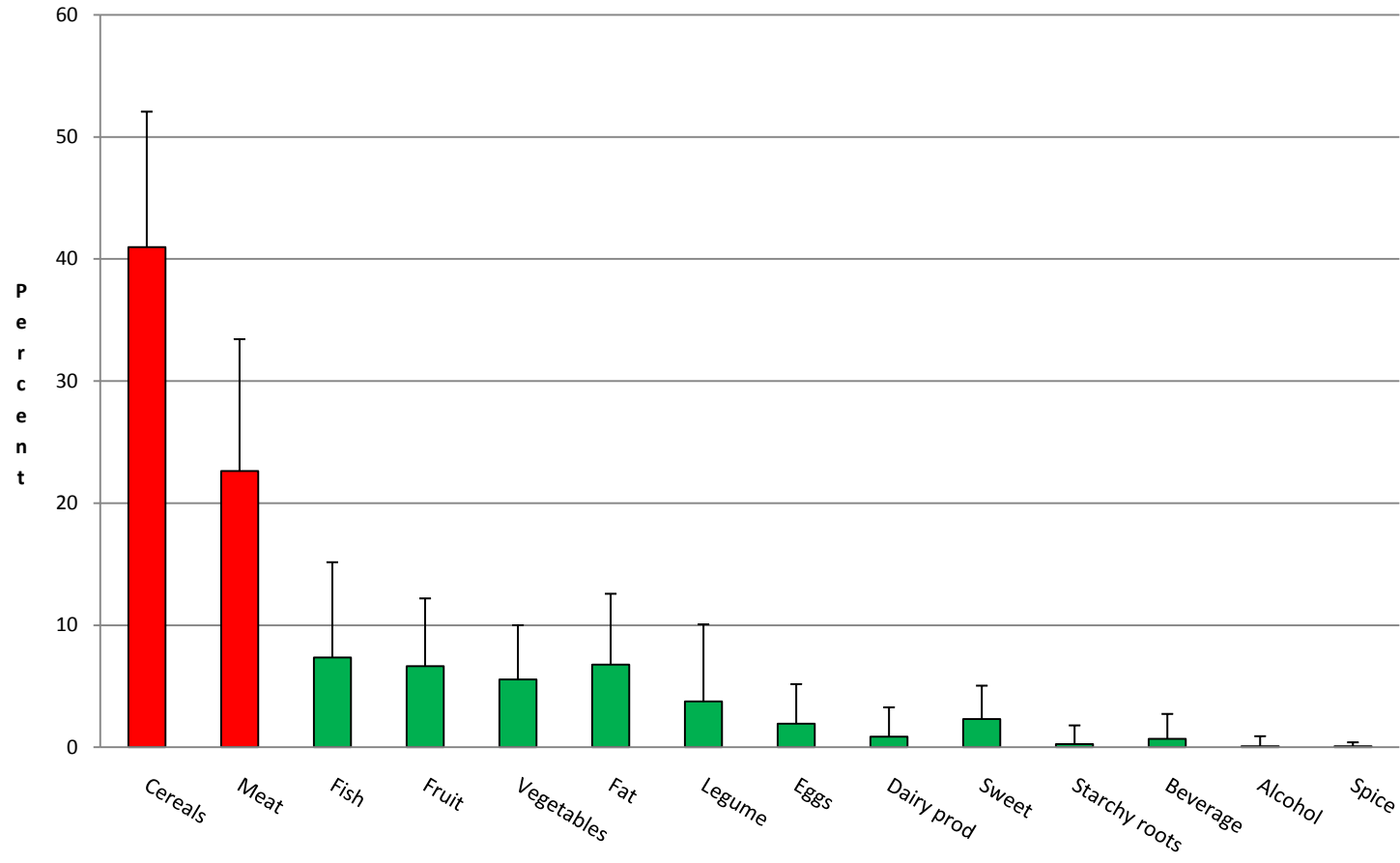
Fulfillment of nutritional needs



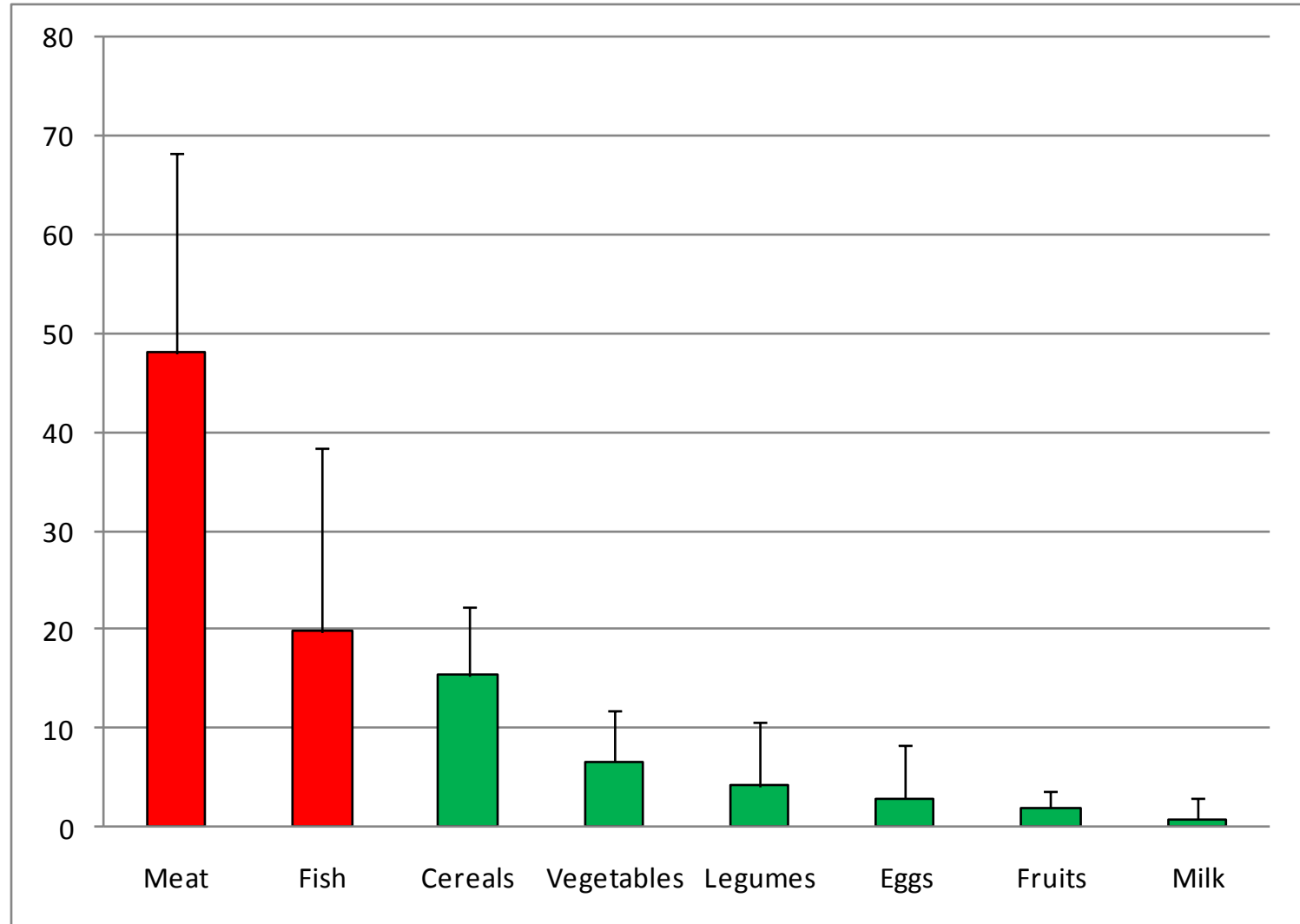
Urbanization and intakes

- No quantitative differences according to urbanization
- But differences in the structure of the diet

Contribution of food groups to energy content



Contribution of food groups to protein content

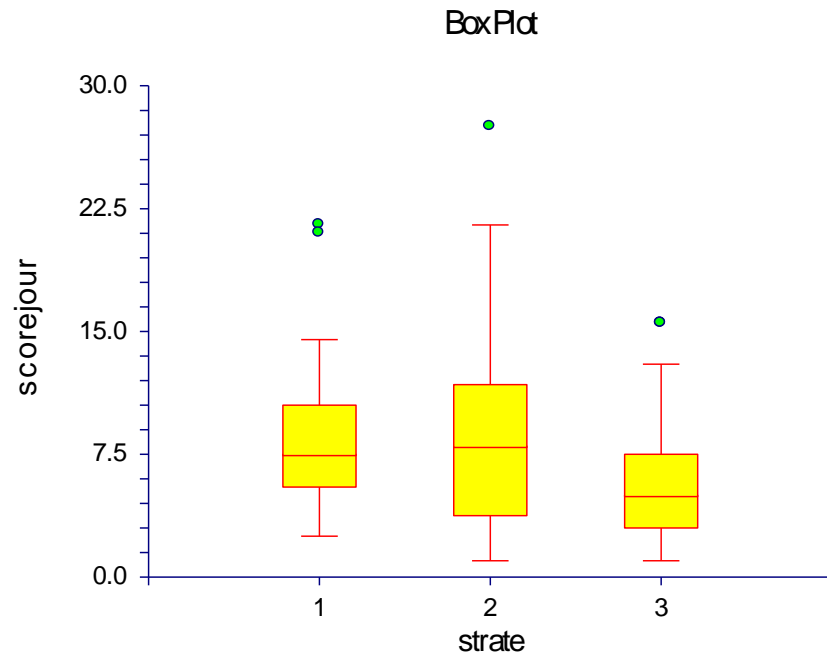


Dietary habits and urbanization

- Significant differences in contribution of food groups to **energy content** (*General linear model of analysis of variance*):
 - Cereal: $p < 0.06$ (area $3 > 2 > 1$)
 - Meat: $p = 0.02$ (area $1 > 2$ and 3)
 - Fish: $p = 0.03$ (area $3 > 2 > 1$)
- Contribution to **protein content**
 - Trend for meat: $p = 0.06$ (area $1 > 2 > 3$)
 - Fish: $p = 0.03$ (area $3 > 2 > 1$)
 - Cereals: $p = 0.08$ (area $3 > 2 > 1$)

Household dietary diversity

Food consumption score elaborated by the WFP (Kennedy, 2010) base on 8 food groups



Greater intake diversity in strata 1 and 2 than in strata 3
($p < 0.003$)

Nutritional status of under 3 yo children

- Overall:
 - Wasting 7.5% (95% CI: 4.7~11.3%)
 - Stunting 13.9% (95% CI: 10.0~18.6%)
 - Underweight 15.0% (95% CI: 11.0~19.8%)
- No effect of urbanization level on either wasting or stunting

Linear growth determinants

- Multiple regression analysis with Height-age as dependent variable and a set of explaining variables:
 - Maternal variable(BMI, H, W)
 - Child variables (BW, age)
 - Categorical variables (urban strata, round)
- The model was pertinent and there were significant effects of
 - Child age
 - Birth weight
 - Women stature
 - And urbanization:
Belonging to strata 2 or 3 was negatively associated with linear growth

Mother status

- Differences in stature ($p < 0.01$) and small trend body mass ($p=0.06$) according to urbanization
 - Strata 2 > 1 and 3
- But corpulence (BMI) and adiposity (Skin folds) did not change

Conclusions

General

- Deficiencies in energy intakes and in nutrients (vit A, folates, calcium, iron) may exist
- Lesser stunting prevalence in the present sample than what is observed at the national level in urban areas (about 32% vs 13% here)
- But, similar prevalence of wasting (around 7%)

Impact of urban development

- Food patterns may vary according to urban status
 - Greater consumption of fish and foods of plant origin in less urbanized areas than in the central part of Vientiane
 - Conversely, greater meat and dairy products consumption in more urbanized areas
- No effect of urbanization in nutritional indices but trend for a faster growth of children living in more urbanized areas
- No clear trends in case of mothers

Commentaries

- A transition in food intakes pattern has been observed elsewhere in PDR Lao:
 - among “traditional ethnic groups” (Jutta Krahn, 2005)
 - At the national level (Kennedy et al, 2011)
- However, in Vientiane data for comparison purposes are lacking
 - Comparability and accuracy of food surveys is an issue

Highlights: 4 points

1. The pace of nutritional transition is slower in PDR Lao compared with other Asian countries
2. Urban households still retained many positive traits of the traditional food habits: *importance of fish, vegetables, fruits consumption...*
3. Until now, the transition process is associated with an improvement in nutritional status
4. However, in certain segments of the population, situation could deteriorate quickly

References

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