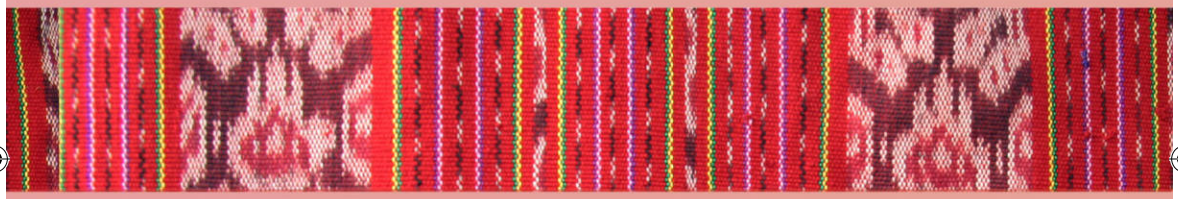
TIMOR-LESTE FOOD AND NUTRITION SURVEY 2013



Summary of Key Findings and Recommendations

Ministério da Saúde





Timor-Leste Food and Nutrition Survey 2013

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Ministry of Health
Democratic Republic of Timor-Leste

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Contents

List of abbreviations

AGP	Acid glycoprotein
ANC	Antenatal clinic
ARI	Acute respiratory infection
BCG	Bacillus Calmette-Guerin
BMI	Body mass index
CRP	C- reactive protein
DPT	Diphtheria, Pertussis (whooping cough), and Tetanus
FCS	Food consumption score
IYCF	Infant and young child feeding
ODF	Open defecation free
ORS	Oral rehydration solution
MoH	Ministry of Health
MND	Malnutrition and micronutrient deficiencies
MNP	Multiple micronutrient powder
MSG	Mother support group
NPM	Non-pregnant mothers
RBP	Retinol binding protein
rCSI	Reduced coping strategy index
SISCa	Serviço integrado da saúde comunitária - Integrated community health services
sTfR	Soluble transferrin receptor
TfR	Transferrin receptor
TLFNS	Timor-Leste food and nutrition survey
UIE	Urinary iodine excretion
UNICEF	United Nations Children's Fund
VAD	Vitamin A deficiency
WHO	World Health Organization

1. Introduction

The Timor-Leste Food and Nutrition Survey (TLFNS 2013) was conducted in 2013 under the leadership and supervision of the Ministry of Health (MoH), Timor-Leste.

The objectives of the TLFNS 2013 were to:

1. Assess the nutritional status of children (aged 0-59 months) and their non-pregnant mothers (aged 14–60 years)[1];

2. Determine the risk factors for undernutrition, including the role of factors affecting infant and young child-feeding practices; and

3. Assess the micronutrient status and aflatoxin exposure of children (aged 6–59 months) and their non-pregnant mothers.

The purpose of this document is to present a brief summary of the key findings and recommendations of the survey. More detailed information is available in the full report.

2. Methodology

The 2013 TLFNS was a cross-sectional survey consisting of three components:

1. Quantitative household survey, representative at the national and district levels;

2. Biochemical survey, representative at the national level; and

3. Qualitative household survey, representative at the national level.

[1] Unless specified otherwise age group for non-pregnant mothers referred to in this document is 14-60 years.

The quantitative household survey included the following measurements:

- anthropometry of children (aged 0–59 months) and their non-pregnant mothers (aged 14–60 years);
- infant and young child feeding (IYCF) practices; and
- haemoglobin concentration of children (aged 6–59 months) and their non-pregnant mothers (aged 14–60 years); and iodine concentration of household salt.

A total of 720 households with children aged 0-59 months, minimally consisting of 323 children aged 0 – 23 months and 391 children aged 24 – 59 months were included in the sample size in each district, resulting in a total sample size of 9,360 children (13 districts x 720 households).

The biochemical survey measured vitamin A and iron status of children aged 6–59 months and their non-pregnant mothers, zinc status of children only and the urinary iodine status of non-pregnant mothers only. Aflatoxin exposure was measured in both the children and their non-pregnant mothers.

The qualitative survey was conducted in five purposively selected districts (Dili, Bobonaro, Manufahi, Baucau and Oecusse) and examined the influence of social, cultural and traditional values on feeding and caring practices.

3. Ethics approval

The study was approved by Timor-Leste's Ministry of Health (MoH) and conducted under the supervision of the Cabinet of Health Research and Development of MoH. Approval was also granted from the Ethics Committee in the Faculty of Medicine, University of Indonesia for Southeast Asian Ministries of Education Organization to undertake the survey. A material transfer agreement was obtained from the MoH of the Republic of Indonesia to allow the transfer of serum samples for

analysis at laboratories outside Indonesia. Participation in the survey was voluntary and informed consent obtained before the commencement of the survey.

4. Key findings

4.1 Malnutrition in children (aged 0-59 months) and micronutrient deficiencies in children (aged 6-59 months)

4.1.1 Malnutrition

Stunting: Stunting or chronic malnutrition is measured as height/length for age (HAZ/LAZ <-2SD). The prevalence of stunting among children aged 0-59 months was 50.2 percent nationally. Stunting was higher in boys (53.1 percent) than girls (47.2 percent), in rural (54.5 percent) than urban areas (38.9 percent) and in poorer families (classified by wealth quintiles), 59.3 percent for families in the poorest quintile vs. 39.1 percent for families in the richest quintile. Stunting levels were also higher in children with pneumonia and fever, children not given an adequate diet, in those whose mother was less than 145cm in height (short stature) and in children living in families working in agriculture. The prevalence of severe stunting (L/HAZ <-3 SD) was 20.4 percent and was higher in the older age groups (12–59 months), amongst children in the poorest quintile and in rural areas.

Wasting: Wasting or acute malnutrition is measured as weight for length/height (WHZ/WLZ <-2SD). Wasting represents a failure to gain appropriate weight relative to height due to a lack of adequate food or from illness or infection. The prevalence of wasting was 11.0 percent nationally. The problem of wasting was worse among boys (12.9 percent boys vs. 9.0 percent girls). Wasting was found in a small proportion of children less than 6 months (4.5 percent) but the prevalence increased sharply in older children (12.7 percent at age 6–11 months). The prevalence of wasting was significantly lower in rural areas (9.8 percent) than in urban areas (14.3 percent). Bobonaro and Oecusse districts had

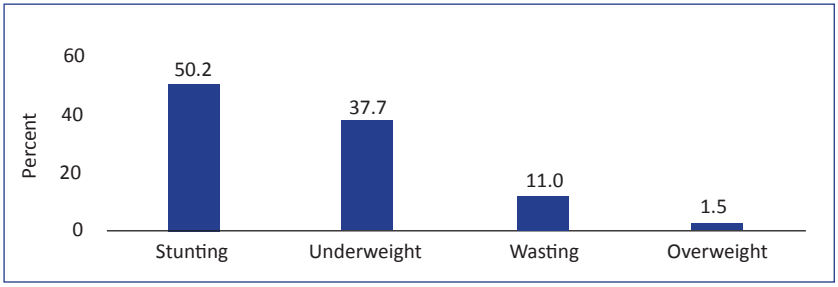
the highest prevalence of severe wasting (2.9 percent), while Manatuto was the lowest (0.6 percent).

Underweight: Underweight is low weight for the child's age. Underweight is a composite of both stunting and wasting. Nationally, the prevalence of underweight was 37.7 percent. Severe underweight was found in 10.1 percent of children. The prevalence of underweight increased with age, i.e. 7.6 percent in children aged less than 6 months, 24.2 percent in children 6–11 months and 49.4 percent in children aged more than 36 months. The prevalence of underweight was lower in urban areas, and richer families. Oecusse (18.2 percent) and Bobonaro (17.2 percent) districts had the highest prevalence of severe underweight.

Overweight/Obesity: The prevalence of overweight (BMIZ >2SD and WHZ >2SD) nationally was 1.5 percent with Manatuto district recording the highest prevalence of 2.9 percent and Liquica and Covalima districts the lowest prevalence of 0.6 percent.

Figure 1 shows the prevalence of stunting, wasting, underweight and overweight among children aged 0-59 months. According to the World Health Organisation (WHO) classification criteria (WHO, 1995), the prevalence rates of stunting and underweight means that Timor-Leste has a 'very high' public health problem of stunting and underweight; and the prevalence rate of wasting means that wasting is a 'serious' public health problem.

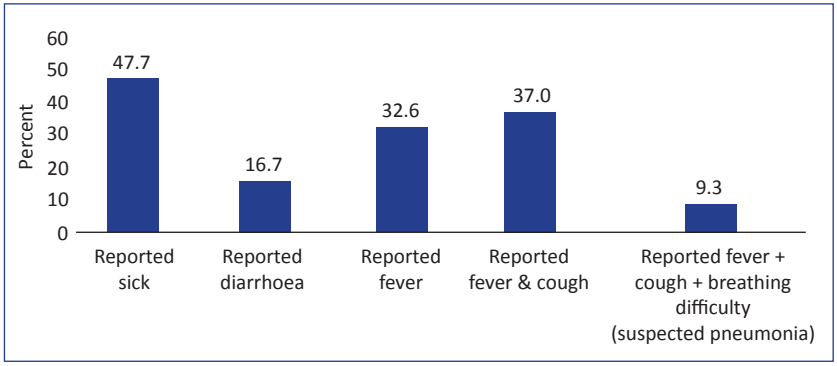
Figure 1: Prevalence of stunting, wasting, underweight and overweight among children aged 0-59 months



4.1.2 Childhood illnesses in children (aged 0-59 months)

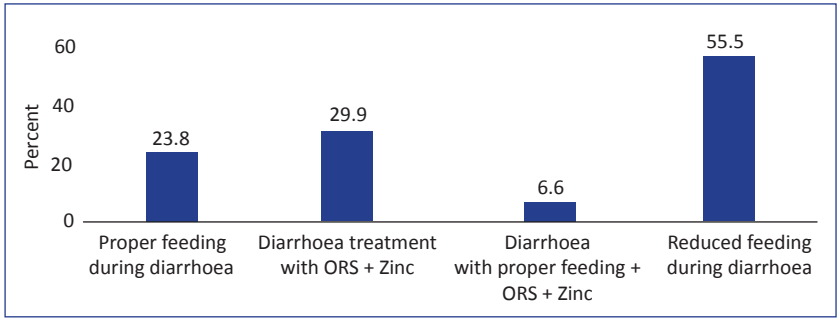
A high proportion (47.7 percent) of children (aged 0-59 months) were reported to have suffered from illnesses in the two weeks prior to the survey. The prevalence of diarrhoea was 16.7 percent, fever 32.6 percent, fever with cough 37.0 percent and acute respiratory infection (ARI) 9.3 percent. The prevalence of illnesses (except for ARI) was significantly higher among children aged 0 – 23 months than among children aged 24–59 months. Figure 2 shows the prevalence of reported illnesses during two weeks preceding the survey.

Fig-2: Reported illnesses among children aged 0-59 months during 2 weeks preceding the survey



Among children aged 0-59 months who had diarrhoea in the previous two weeks, 63.0 percent received oral rehydration solution (ORS), 57.5 percent received medication, but only 33.3 percent received zinc tablets, and fewer 29.9 percent received ORS and zinc tablets. Only 6.7 percent of children received the correct feeding, ORS and zinc tablets. Figure 3 shows feeding practices and treatment of diarrhoea among children aged 0-59 months.

Figure 3: Feeding practices and treatment of diarrhoea among children aged 0-59 months

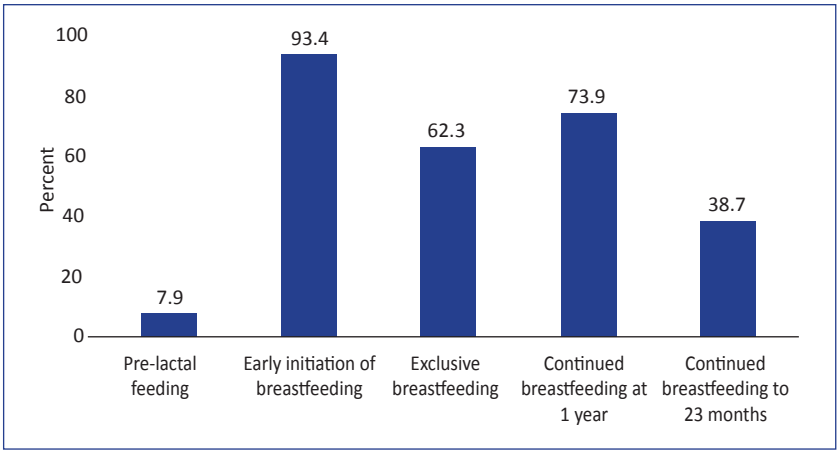


Caregivers who had the highest level of education had children with the lowest rates of diarrhoea and suspected pneumonia. Households with higher incomes and who were located in open defecation free (ODF) areas had lower incidence of disease. Suspected pneumonia was not related to feeding but was higher in households with poor housing conditions, especially in those using wood or charcoal for cooking, where indoor smoke pollution was more common. Diarrhoea was more frequent in children who were not given colostrum and were bottle-fed. Conversely, prevalence was lower in children who had been breastfed, in families who used hand-washing facilities and in areas where a mother support group (MSG) was active.

4.1.3 Infant and young child feeding (IYCF) practices

Breastfeeding: Breastfeeding for the first few years of life protects children from infection, provides an ideal source of nutrients, and is economical and safe. The cessation of breastfeeding too early increases the risk of growth faltering, malnutrition and infection. Figure 4 shows breastfeeding practices among children aged 0-23 months.

Figure 4: Breastfeeding practices among children aged 0-23 months



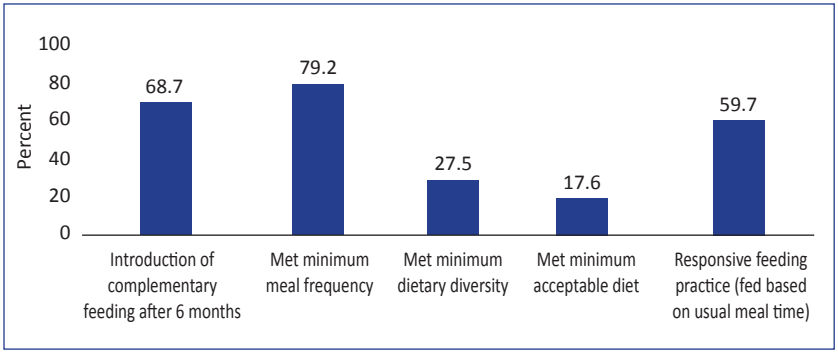
The prevalence of breastfeeding within one hour of birth was 93.4 percent and the prevalence of exclusive breastfeeding (i.e. giving only breastmilk and no other food or liquid) to infants aged less than 6 months (180 days) was 62.3 percent. There was a sharp decrease in the prevalence of continued breastfeeding after 6 months of age from 73.9 percent among infants aged 12–15 months, to 38.7 percent among infants aged 20–23 months. Exclusive breastfeeding was significantly higher among mothers who were younger, of normal weight, participated in antenatal clinic (ANC) which was attended by a village midwife, had a lower workload and whose child was healthy.

Complementary feeding

Adequate complementary feeding for children aged 6 to 23 months is particularly important for normal growth and development and the prevention of undernutrition.[2] Figure 5 shows complementary feeding practices among children aged 6-23 months.

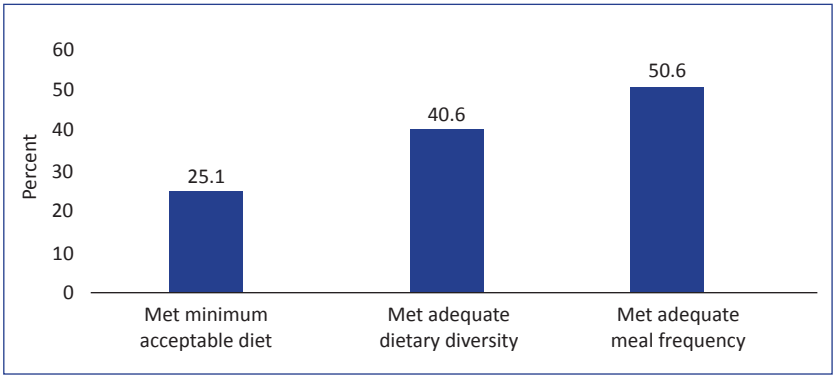
[2] Continued breastfeeding beyond 6 months should be accompanied by consumption of nutritionally adequate, safe and appropriate complementary foods that help meet nutritional requirements when breast milk is no longer sufficient. This requires that breastfed children 6 – 8 months old have two or more meals of solid, semi-solid or soft foods, and if they are 9 – 23 months of age, three or more meals. For children aged 6 – 23 months and older who are not breastfed, four or more meals of solid, semi-solid or soft foods or milk feeds are needed.

Figure 5: Complementary feeding practices among children aged 6-23 months



The prevalence of children (aged 6–23 months) who were fed the recommended minimum number of meals appropriate for their age each day was 79.2 percent. However, the prevalence of children meeting "minimum dietary diversity" to ensure that each child has a variety of foods[3] in his/her diet was only 27.5 percent. Among children aged 24–59 months 40.6 percent had met "minimum dietary diversity" (had adequate dietary diversity with ≥ 4 food groups). The types of food given most frequently was cereals/roots/tubers followed by vitamin A rich fruits and vegetables, and other fruits/vegetable. Foods from animal sources were consumed relatively rarely. Figure 6 shows feeding practices among children aged 24-59 months.

Figure 6: Feeding practices among children aged 24-59 months



[3] The seven food groups considered were: i) grains, roots and tubers; ii) legumes and nuts; iii) dairy products (milk, yogurt, cheese); iv) animal foods (meat, fish, poultry and liver/organ meats); v) eggs; vi) vitamin A rich fruits and vegetables; vii) other fruits and vegetables.

The minimum acceptable diet for children aged 6–23 months was achieved by 17.6 percent of mothers but the prevalence was lower for infants who were not breastfed (3.5 percent non-breast fed vs. 24.4 percent breastfed) and significantly higher among mothers who had better caring capacity, i.e. they were better educated, had good nutritional status and health, were empowered to make decisions on food intake, had a lower workload, received counselling support from health workers, and came from households with a higher food consumption score and socio-economic status. The prevalence of anaemia and stunting in children (aged 0-23 months) was higher in children not following the recommended IYCF practices.

Household food consumption

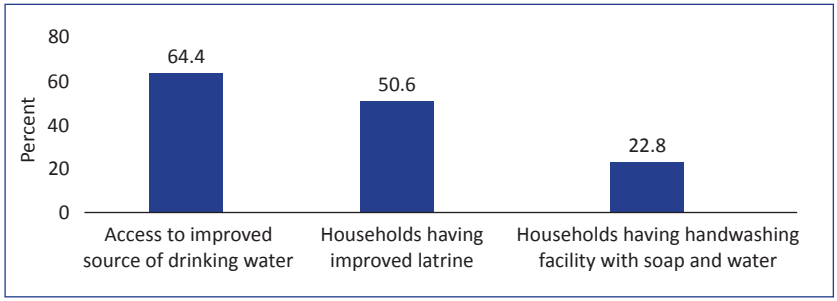
The food groups that were consumed most frequently by the families in the past seven days preceding the survey were staples, vegetables, condiments, sugar and oil/fat. The food groups eaten least often were meat and fish, fruits, pulses and milk. The Food Consumption Score (FCS) is a composite score based on food frequency, dietary diversity and the relative nutrition importance of the different food groups. Based on FCS, 61.3 percent of households were classified as having an acceptable food consumption (FCS more than 42), 27.8 percent as 'borderline' (FCS 28.5 – 42) and 10.9 percent as 'poor' (FCS 0-28). Although almost two-thirds (60 percent) of the households had an acceptable FCS, only 17.6 percent of the children aged 6 – 23 months had consumed a minimal acceptable diet.

4.1.4 Water, sanitation and hygiene

An improved water source is protected from outside contamination, particularly faecal matter. Strategies to improve the water source include: having piped water in a dwelling, plot or yard having public taps or standpipes, tube wells or boreholes, protecting dug wells, protecting springs and rainwater collection. An improved drinking water source was accessible to 64.4 percent of households and although 74.9 percent of households had soap, appropriate hand-washing facilities were only available to 40.7 percent of households. Improved sanitation includes the availability of facilities that minimise the human contact with excreta, e.g. flush or pour-flush toilet/latrine to a piped sewer system,

septic tank or pit latrine; ventilated improved pit latrine; pit latrine with slab or composting toilet. Such facilities were available to 50.6 percent of households. Figure 7 shows household access to water, sanitation and hand washing facility.

Figure 7: Households having access to water, sanitation and hand washing facility



4.1.5 Community development

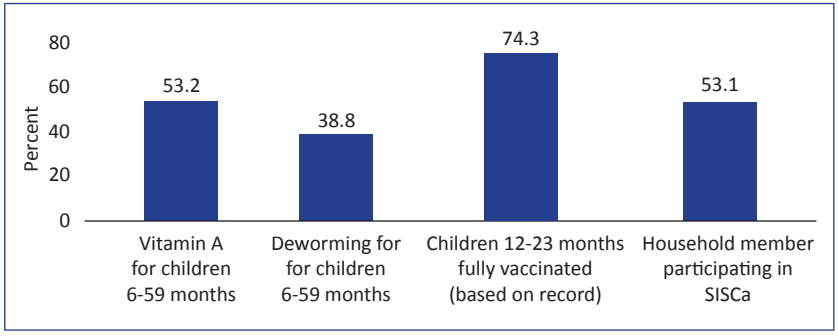
One third of the surveyed households were from areas which were involved in the Open Defaecation Free (ODF) initiative and a third had mother support groups (MSG) in their *Suco*[4] (village). However, only 7 percent of households were located in areas where both ODF and MSG programmes existed, and 46 percent of the subjects were not located in either ODF or MSG programme areas. In areas declared ODF, the prevalence of anaemia was lower and lowest in areas where 50% or more of the *aldeias* (hamlets) were classified as ODF. There was a significant association between the presence of the MSG programme and a lower prevalence of diarrhoea among children and thinness among mothers, which emphasized the value of education and counselling to mothers and community workers in order to improve the nutrition of children and their mothers. The MSG programme is an important component to strengthen the community/family and caregivers' knowledge.

[4] Suco is the lowest administrative unit of Timor-Leste Socio-political structure headed by an elected suco chief (xefe suco). Geographically suco involves 4 -5 natural villages with an average population of 2,500 in total.

4.1.6 Utilisation of child health and nutrition services

The coverage of basic health services for children was generally better than that of nutrition services. For example, 74.3 percent of children aged 12–23 months received the complete basic immunization (BCG, hepatitis, polio, DPT and measles), but only 53.2 percent of children aged 6–59 months received vitamin A capsules and fewer deworming tablets (38.8 percent). Appropriate treatment for diarrhoea was received by only 6.7 percent (ORS + zinc + continued breastfeeding + adequate food and liquids). The participation of household members in the Integrated Community Health Services - *Serviço Integrado da Saúde Comunitária (SISCa)*, was low (53.1 percent). Figure 8 shows the utilisation of some indicators of health and nutrition services.

Figure 8: Utilisation of health and nutrition services



Multiple micronutrient powder (MNP) is a single-dose packet of vitamins and minerals in powder form that can be sprinkled onto any ready-to-eat semi-solid or solid food consumed at home. MNP distribution was piloted in Alieu district from 2012 targeting children aged 6–23 months where 71.9 percent of children received them and 65.7 percent of their caregivers said that their child consumed MNP the previous day. Anaemia prevalence was lower among those receiving the MNP compared to those who did not, but it was not significant. However compared to all other districts the prevalence of anaemia in children aged 6-23 months was lower in Ailieu (51.9 percent in Ailieu as compared other districts where prevalence ranged from 55.8 to 73.6 percent).

4.1.7 Risk factors associated with undernutrition among children

The lower prevalence of stunting among children aged 0–23 months was associated with giving colostrum, early initiation of breastfeeding, and responsive IYCF practices. Among children aged 6–23 months, meal frequency, adequate diet and availability of fortified foods were also important. Any child not receiving an adequate diet is at risk of growth faltering because the child's dietary needs are not being met and growth may be impaired. Other important factors for the growth and development of children aged 6–23 months were immunization coverage, mothers attending ANC, and mothers seeking health and nutrition services for herself and her child.

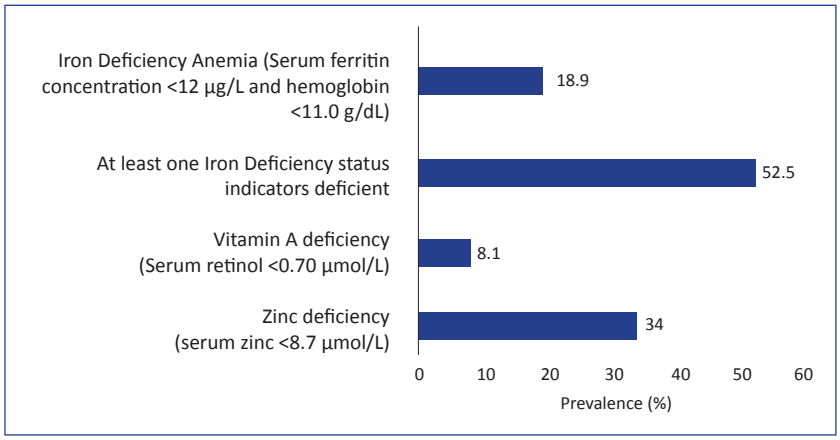
The prevalence of stunting among children of families who had access to improved sanitation and hand-washing facilities was lower, perhaps because there was less exposure to potential sources of infection due to better hygiene practices. However, whenever illness occurs, e.g. pneumonia and fever, it is often accompanied by anorexia, a period of time when the child does not want to eat, hence in children exposed to repeated sources of infection there is more risk of stunting because there is no time for catch-up growth before the next illness.

The significant association between poorer families and an increased prevalence of stunting in children aged 0–59 months was in part a proxy for poor education and housing. In addition, farming communities had a higher risk of stunting in children, even after adjusting for all other factors.

4.1.8 Micronutrient deficiencies

The figure 9 shows the status of key indicators of micronutrient deficiency among children aged 6-59 months.

Figure 9: Micronutrient deficiency among children aged 6-59 months



Iron status of children

The prevalence of anaemia (haemoglobin concentration <110 g/L) among children aged 6–59 months was 62.5 percent indicating that Timor-Leste has a 'severe' public health problem among children (prevalence of anaemia ≥40 percent). Amongst the children, boys were more vulnerable to severe and moderate anaemia than girls, and anaemia was higher among children aged 0–23 months. The two measures of body iron stores, serum ferritin and body iron, both suggested that about a third of the anaemia was associated with low body iron stores and 62.0 percent was associated with high transferrin receptor (TfR) concentrations, i.e. low circulating iron.

Low iron stores in the liver as measured by corrected[5] serum ferritin concentrations were found in 20.5 percent of children, and the measure of tissue iron deficiency, body iron, gave a similar result of 23.2 percent. Functional iron deficiency as measured by serum TfR was found in 51.7

[5] for inflammation

percent of children. Median concentrations for serum ferritin, TfR and body iron did not differ between boys and girls, but the prevalence of low serum ferritin and body iron stores was significantly higher among boys than girls.

The prevalence of iron deficiency among children aged 6–23 months was higher by all parameters (38.3 percent low ferritin, 75.7 percent low TfR and 42.6 percent low body iron concentrations) compared to those of children aged 24–59 months (7.1 percent low serum ferritin, 33.7 percent low TfR, and 8.7 percent low body iron concentrations). In addition, children from households with poor quality housing, and children not consuming green leafy vegetables, had a significantly higher level of iron deficiency.

Zinc status of children

Zinc is important for the growth of cells, cellular differentiation and metabolism therefore deficiency of zinc limits the growth of children and decreases resistance to infections. In the survey population, 34.0 percent of the children (aged 6-59 months) had serum zinc concentrations less than 8.7 µmol/L indicating that zinc deficiency may be of concern in the population[6]. The prevalence of zinc deficiency did not vary according to age or sex, but those from the poorest families had the lowest serum zinc concentration (9.09 for the poorest quintile vs. 9.81 µmol/L for the richest quintile). Zinc deficiency among children from rural areas (42.0 percent) was significantly higher than among children from urban areas (18.6 percent). Zinc deficiency was also significantly higher among children living in poor quality houses and using an unimproved drinking water source.

Vitamin A status of children

Vitamin A deficiency (VAD) is the leading cause of preventable blindness in pre-school children, although this severe form of VAD is seen less often now due to the availability of vitamin A supplements and fortification of foods. VAD increases the risk of severe illness, and even death, from common childhood infections as diarrheal disease and measles. Children may become VAD because their mothers are

[6] WHO public health significance is prevalence equal to or greater than 20

deficient and produce breastmilk low in vitamin A and they are given complementary foods low in vitamin A.

After correction for inflammation, 9.7 percent of children aged 6–59 months had low serum retinol binding protein (RBP) and 8.1 percent low retinol (< 0.70 µmol/L) indicating VAD is a mild public health problem. Younger children (aged 6–23 months) had slightly but significantly lower serum concentrations of RBP and retinol compared to those aged 24–59 months. In addition, serum concentrations for both analytes were lower among boys than girls. Children residing in urban areas had higher prevalence of deficient RBP and retinol concentrations compared to their rural counterparts.

4.1.9 Risk factors associated with micronutrient deficiencies

The analysis showed that risk factors associated with micronutrient deficiencies among children aged 6–59 months included the following:

i. A lower prevalence of anaemia in children was associated with being older, female, living in a rural area, parents owning land and earning a living from agriculture, the mother being part of a MSG programme, the family not exposed to 'shock'[7] in the last 12 months and living in an ODF programme area.

ii. Iron deficiency, as measured by serum ferritin concentrations, was associated with younger children (aged 6–23 months), male children, poor housing and with poorer or no education of the mother. Children build up iron stores with increasing age and this is reflected in the significant association of serum ferritin with age.

iii. VAD was associated with younger children (aged 6–23 months), not consuming fortified foods, not receiving basic immunization, mothers with high school/university education and household resilience to shock (i.e. the family had experienced shock in the previous 30 days). Liver stores of vitamin A increase with age and this is

[7] Shock may be defined as the death of an active/productive adult, or other household member, natural disasters e.g. erosion/landslide/fire/damage to the house, late rain/drought/heavy rain/flood, crop failure or livestock diseases.

reflected in the lower vitamin A concentrations in children aged 6–23 months old. The consumption of fortified complementary foods will improve the intake of all vitamins and minerals added, and the data showed an increased risk of lower retinol/RBP concentrations in those not eating fortified food. Basic immunisation programmes reduce the risk of infections, and in those not immunised, the risk of infections increases. Mother's lack of education and the poverty level of the household both impact on the conditions in which a child is brought up and may mean the child is exposed to an environment with more inflammatory stimuli. Repeated infections will have a negative effect on the circulating concentrations of both retinol and RBP and result in VAD. Finally, the low coverage of the vitamin A supplementation for the 6 – 59 month old children may also be impacting on the retinol/RBP concentrations.

iv. A lower prevalence of zinc deficiency among children was associated with an improved source of drinking water, living outside an ODF programme area (a proxy for wealthier environment), having a higher education level and being food secure.

4.2 Malnutrition and micronutrient deficiencies among non-pregnant mothers (aged 14-60 years)

4.2.1 Malnutrition among non-pregnant mothers

The prevalence of thinness was 24.8 percent indicating a serious public health problem. The prevalence of severe thinness was 2.7 percent, and the prevalence of overweight (BMI $\geq$ 25 kg/m^2) was 10.2 percent.

The average height of the non-pregnant mothers was 151 cm and the prevalence of short stature (less than 145 cm) was 12.6 percent. Short maternal height is associated with poor foetal growth and low birth weight, which increase the risk of infant death and poor growth. Maternal short stature and thinness were significantly associated with stunting in children.

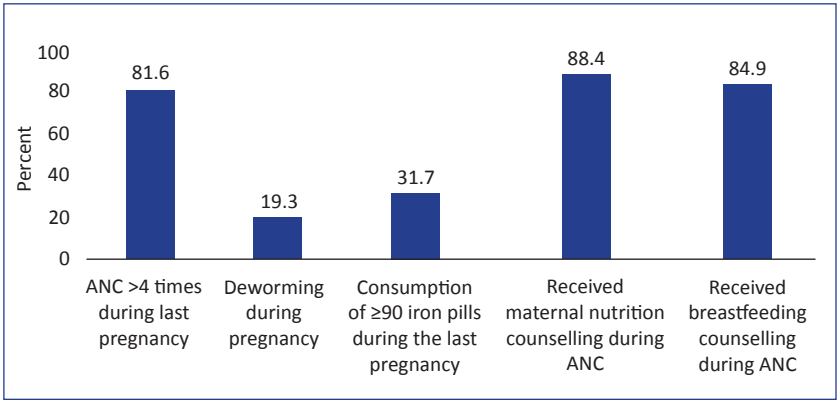
4.2.2 Risk factors associated with thinness among non-pregnant mothers

A higher risk of thinness was associated with shorter birth spacing, less frequent antenatal care visits, fewer pregnancies, lower wealth quintile, low ODF coverage and poor housing. Mothers in urban areas were at higher risk of thinness than in the rural areas.

4.2.3 Utilisation of maternal health and nutrition services

A high proportion of mothers (87.2 percent) went for antenatal care (ANC) during their last pregnancy, of those 85.7 percent went to a trained health provider. ANC visit during the first trimester was 62.3 percent and 81.6 percent attended 4 or more times. Also, 45.4 percent of non-pregnant mothers said they received Timor Vita[8], 19.3 percent were dewormed and 31.7 percent took 90 or more iron-folic acid tablets during their last pregnancy. Counselling on breastfeeding and maternal nutrition were received by more than 80 percent of non-pregnant mothers, and data indicated that communities regard health workers as the main source of information on issues relating to nutrition and health in general, and on nutrition and health of women and children in particular. Figure 10 shows the level of reported utilization of some key services by non-pregnant mothers of children aged 0-59 months.

Figure 10: Utilization of health and nutrition services by mothers aged 14-60 years

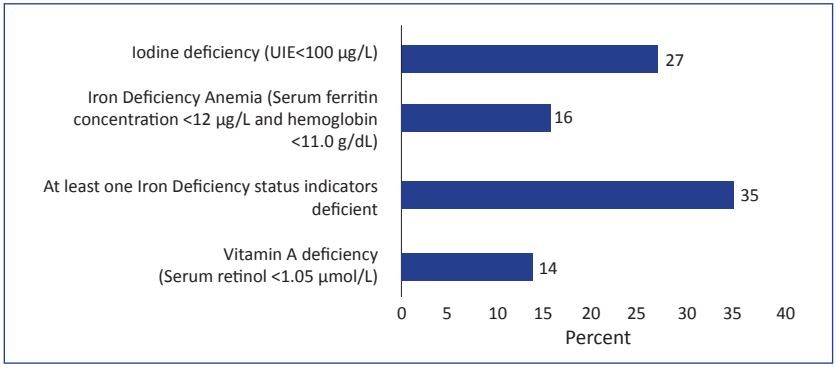


[8] A fortified blended food (corn-soya) distributed to malnourished pregnant and lactating mothers.

4.2.4 Micronutrient deficiencies among non-pregnant mothers

Figure 11 shows the status of key indicators of micronutrient deficiency among non-pregnant mothers.

Figure 11: Micronutrient deficiency among non-pregnant mothers aged 14-60 years



Anaemia among non-pregnant mothers

The prevalence of anaemia[9] (haemoglobin < 120 g/L) among non-pregnant mothers was 38.9 percent, indicating it is a 'moderate' public health problem.

Iron status of non-pregnant mothers

Very few non-pregnant mothers had elevated acute phase proteins, indicating exposure to bacteria or viruses, as measured by CRP concentrations more than 5 mg/L and AGP concentrations more than 1 g/L. Elevated CRP concentrations were found in 2.5 percent of non-pregnant mothers, 4.6 percent had both CRP and AGP elevated and 7.4 percent had AGP alone elevated.

Low iron stores in the liver as measured by corrected serum ferritin concentrations were found in 21.3 percent of non-pregnant mothers, and the measure of tissue iron deficiency, as measured by body iron stores

[9] Anaemia is defined as the condition of having less than normal number of red blood cells or less than normal quantity of haemoglobin in the blood. Anaemia is caused by lack of iron, folate or vitamin B12. Source: http://www.unscn.org/en/gnc_htp/modul.php?modID=27

gave a similar result of 17.9 percent. Functional iron deficiency as measured by sTfR was found in 29.4 percent of non-pregnant mothers. The prevalence of low serum ferritin concentrations was lower in non-pregnant mothers aged 35 years or more.

Vitamin A status of non-pregnant mothers

The prevalence of marginal VAD (retinol and RBP < 1.05 µmol/L) was 13.5 percent (retinol) and 4.9 percent (RBP). Higher RBP concentrations were found in the poorest non-pregnant mothers with no education, and living in rural areas. Similarly the highest retinol concentrations were found in non-pregnant mothers with no education living in rural areas but there were no differences by wealth. The normal retinol concentration range is between 1 and 3 µmol/L, hence the mean retinol concentration in the NPM is considered within the normal range.

Urinary iodine excretion among non-pregnant mothers

The prevalence of iodine deficiency (urinary iodine < 100 µg/L (UIE)) was 26.7 percent. Non-pregnant mothers aged 35 years or more, with no education and living in rural areas had lower median UIE concentrations than educated non-pregnant mothers aged less than 35 years living in urban areas. Only 13.5 percent of the non-pregnant mothers had very low UIE concentrations (< 50µg/L)[10], and 1.3 percent had high UIE. Non-pregnant mothers in urban areas had higher UIE than those in rural areas (2.2 percent vs. 0.8 percent).

Iodine content in household salt

The proportion of households consuming adequately iodised salt (≥15 ppm iodine) was 42.7 percent nationally, the highest was in Viqueque district (68.4 percent) and lowest in Oecusse (10.8 percent). This low utilisation of adequately iodised salt may be a contributing factor to the elevated prevalence of iodine deficiency disorders found in non-pregnant mothers.

[10] WHO recommends less than 20 percent proportion of non-pregnant/lactating women (and school-aged children) to have UIE<100 µg/L.

Risk factors associated with micronutrient deficiencies among non-pregnant mothers

i. Prevalence of maternal anaemia was lower amongst mothers having more than two pregnancies, attending health services for ANC more than four times, having iron-folic acid supplementation during pregnancy, being food secure, not being exposed to 'shock' in the last 12 months, living in an area where 50 percent or more of the *aldeias* (hamlets) were in an ODF area and living in a rural area.

ii. Iron deficiency, as measured by corrected serum ferritin concentrations, was associated with not eating eggs (eggs contain about 6 percent iron), and living where less than 50 percent of the aldeias have an ODF programme. Body iron concentrations were significantly higher in the poorest families and in urban areas median concentrations of serum TfR were lower in the poorest families and in urban areas.

iii. A lower prevalence of marginal VAD was found in mothers who lived in aldeias where more than 50 percent were in an ODF programme area. Less than 10 percent of the range in retinol/RBP concentrations was explained. Only two factors were significant, living in an area without an ODF programme and with non-pregnant mothers classified as middle income. The association with living in an area without an ODF programme might increase the risk of the exposure to possible inflammatory stimulants but the association with income is not easily explained.

iv. Mothers who had two or more pregnancies and lived in rural areas were more at risk of iodine deficiency. Iodine requirements are greatly increased during pregnancy and lactation and some of the mothers were still breastfeeding at the time of the survey. Iodine requirements remain elevated, as the breastfeeding mother provides the nursing infant with its sole source of iodine while the infant is exclusively breastfed and this fact may have had an impact on the prevalence of low UIE concentrations.

4.3 Aflatoxin exposure among children (aged 6-59) months and non-pregnant mothers

Aflatoxin is a type of fungi called *Aspergillus moulds*. Aspergillus moulds grow mostly on crops, such as grains and nuts. In developing nations, many people are exposed to aflatoxin through food grown at home and stored in poor conditions. Exposure to small amounts of aflatoxins over a long period through food contaminated by the fungi can lead to growth and development impairment in children, and liver cancer in adults.

Detectable aflatoxin concentrations were found in 83 percent of children aged 6–59 months. Older children (aged 24–59 months) had higher concentrations of serum aflatoxin than younger children. Children from the high wealth quintile families and those who lived in urban areas had significantly lower serum aflatoxin concentrations compared to children from poorer families and rural areas. Aflatoxin exposure was associated with an increase in the prevalence of stunting and anaemia in children (aged 6–59 months). There were many significant associations between having a detectable aflatoxin concentration and demographic and socio-economic factors suggesting that rural living, poor education and housing were underlying problems leading to a possible a lack of understanding of the risks of poor crop processing, i.e. from planning to storage.

The prevalence of detectable aflatoxin exposure in non-pregnant mothers was 81.4 percent. Aflatoxin concentration was higher amongst the poorer mothers.

Aflatoxin exposure was of concern for both children and their mothers. For children the high prevalence of exposure was associated with an increase in the prevalence of stunting and anaemia.

4.4 Household decision making

Both parents separately or in combination made decisions in the households regarding health and nutrition. In 57.8 percent of families both parents together made decisions with regard to the health of the children, but in one in 10 households men made decisions regarding health care, hence they too should be a target for nutrition/health education. In half of the families (50.7 percent), both parents made a joint decision on major household purchases. The mother was often the main decision maker regarding food related issues, e.g. what kind of foods to be cooked (78.8 percent) and the types of food to be given to the youngest children (77.3 percent).

4.5 Families' socio-economic factors, livelihood, shocks, coping strategies and social assistance

House ownership was high (84.1 percent) amongst the households surveyed, but a high proportion of houses were of poor quality with 58.5 percent having a dirt/earth floor. The prevalence of households with electricity was 69.2 percent but only 16.8 percent cooked using electricity. Generally, cooking was done on fires using wood/charcoal/hay (81.3 percent). Where electricity was present, other household assets included: mobile phones (87.9 percent), television (37.4 percent), and radio (54.6 percent).

Land ownership for the production of staple foods (corn/roots/tubers), fruits and vegetables was high (76.4 percent) amongst the households surveyed. In addition, 86.3 percent households raised livestock: pigs (87.8 percent), poultry (87.4 percent) and other type of livestock (53.0 percent). The sale of agricultural crops was the main livelihood for 84.2 percent of households, livestock production provided income for 10.2 percent of households. The proportion of households earning an income from salaried work, skilled work or commercial trading was 30 percent.

Generally non-pregnant mothers were involved in low to intermediate income jobs, e.g. 29.9 percent were employed in brewing/handicraft/

artisan trades and petty trading (28.3 percent). Both non-pregnant mothers and men reared livestock (51.5 percent), provided unskilled labour for non-agricultural work (50.4 percent) and took part in petty trading (48.4 percent). Men were able to get salaried jobs (84.0 percent), provide skilled labour (97.4 percent) and unskilled labour for non-agricultural work (85.6 percent).

Overall, 21.6 percent of households reported experiencing some type of 'shock' in the last 12 months. In most cases, the 'shock' reduced household income (more than 50 percent) and only 20 percent of households were able to fully recover after a 'shock'. Overall, in the 12 months before the survey 21.6 percent of households experienced some kind of shock. Fewer had experienced shock in the previous 30 days (13.3 percent), and in the previous 7 days (13.1 percent). An index called the Reduced Coping Strategy Index (rCSI), a measure of how well families could cope showed that majority of households were more resilient to shock and overall for Timor-Leste the rCSI ranged from 0 to 46 with a median value of three. As the median value was low, this means household resilience was good. However, the major ways families coped with 'shock' were by spending savings (30.6 percent), borrowing money (19.5 percent), sending an adult to work elsewhere (18.7 percent), selling productive assets (19.7 percent), or reducing non-food expenditure e.g. on health and education (15.1 percent).

Few households (20 percent) received any assistance to improve health and nutritional status, to access education (less than 7 percent) or for help with income generation (less than 10 percent). Participation in social activities was limited to religious activities (62.7 percent), SISCa (53.1 percent) and farming groups (34.3 percent). The qualitative findings showed that households value rituals and ceremonies to keep family ties and family members are the first to be asked for help when needed.

5. Key recommendations

1. Prevent and control stunting among children aged 0–59 months by focusing on the pre-pregnancy and the first 1000 days of life, increasing compliance to recommended IYCF practices, improving dietary diversity, improving coverage and compliance of micronutrient supplementation and fortification programmes, and coverage of health and nutrition services.

2. Prevent and control anaemia and iron deficiency among children and women by improving dietary diversity particularly the intake of haem and non-haem iron food sources, improve hygiene and sanitation practices, expand the MNP programme and increase coverage of micronutrient supplements and deworming, and improve health and nutrition services for women during pregnancy.

3. Prevent and control wasting in children aged 0-59 months by providing community- and inpatient-based treatment and providing food supplements in food insecure areas.

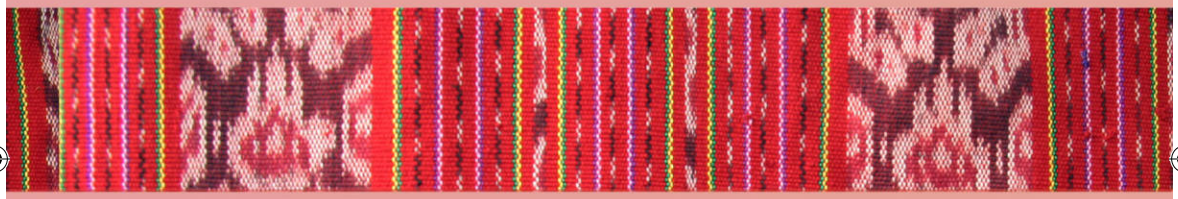
4. Improve the health of women and children through education, basic health interventions e.g. deworming, ORS and zinc, immunization, universal salt iodisation, improved drinking water and sanitation, and hygiene and healthy housing.

5. A joint inter-ministerial study should be conducted to identify the source and level of aflatoxin in food and implement plan of action to reduce aflatoxin exposure.

6. Ministry of Health to prepare an action plan on the behavior change communication related to food intake and diversity by promoting a national theme "*4 Saudáveis 5 Balanço*" (Healthy 4 Balance 5).







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