# Malnutrition among children under 60 months of age in two cities of the state of Acre, Brazil: prevalence and associated factors

## *Desnutrição em crianças menores de 60 meses em dois municípios no Estado do Acre: prevalência e fatores associados*

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***Abstract***

**Objective:** To investigate the prevalence of malnutrition and associated factors in children under the age of 60 months in two cities in the state of Acre, Brazil. **Methods:** A population-based cross-sectional study was carried out with 667 children living in urban areas of the cities of Acrelândia and Assis Brasil. The prevalence of malnutrition was calculated by height for age (stunting) and weight for height (W/H) indexes, which were calculated with a cutoff point of -2 for Z scores as determined by the 2006 World Health Organization child growth standards. A structured questionnaire was used to gather information on socioeconomic conditions, access to services and child care, birth weight and morbidity. Poisson regression was used to identify the factors associated with child malnutrition. **Results:** The prevalence of height-for-age and weight-for-height deficit was 9.9% and 4.1%, respectively. The factors associated with height-for-age deficit were low household wealth index (prevalence ratio [PR]: 1.74; 95% confidence interval [95% CI]: 0.95 – 3.18); having an illiterate father or stepfather (PR: 1.82; 95% CI: 1.01 – 3.27); having 2 or more younger siblings (PR: 2.88; 95% CI: 1.45 – 5.72); biological mother not living in the home (PR: 2.63; 95% CI: 1.32 – 5.24); and exposure to open wastewater near the home environment (PR: 2.46; 95% CI: 1.51 – 4.00). "Low weight at birth" was the only factor associated with weight-for-height deficit (PR: 2.91; CI95%: 1.16-7.24). **Conclusions:** In the cities studied, malnutrition in children under 60 months is an important public health problem, and is associated with indicators of social inequality, access to health services and biological mother not living in the home.

**Keywords:** Malnutrition. Child health. Nutritional status. Cross-sectional survey. Anthropometry. Nutritional epidemiology.

## *Resumo*

**Objetivo:** Investigar a prevalência da desnutrição e fatores associados em crianças menores de 60 meses em dois municípios do Estado do Acre. **Métodos:** Estudo transversal de base populacional realizado com 667 crianças da área urbana dos municípios de Acrelândia e Assis Brasil. A prevalência da desnutrição foi calculada pelo padrão de crescimento da Organização Mundial da Saúde de 2006, com o ponto de corte -2 escores Z. Informações sobre condições socioeconômicas, acesso aos serviços e cuidado da criança, peso ao nascer e morbidade foram obtidas por questionário estruturado. A regressão de Poisson foi utilizada para identificar os fatores associados à desnutrição de crianças. **Resultados:** A prevalência do déficit estatura para idade e déficit peso para estatura foi de 9,9% e 4,1%, respectivamente. Os fatores associados ao déficit estatura para idade foram o baixo índice de riqueza (razão de prevalência [RP]: 1,74; intervalo de confiança em 95% [IC95%]: 0,95 - 3,18), analfabetismo do pai ou padrasto (RP: 1,82; IC95%: 1,01 - 3,27), ter 2 ou mais irmãos menores (RP: 2,88; IC95%: 1,45 - 5,72), ausência da mãe biológica no domicílio (RP: 2,63; IC95%: 1,32 - 5,24) e exposição ao esgoto a céu aberto no âmbito domiciliar (RP: 2,46; IC95%: 1,51 - 4,00). Somente o baixo peso ao nascer mostrou-se como fator associado ao déficit peso para estatura (RP: 2,91; IC95%: 1,16 - 7,24). **Conclusões:** Nos municípios estudados, a desnutrição em crianças menores de 60 meses apresenta-se como um importante problema de saúde pública, associado aos indicadores de iniquidades sociais, acesso aos serviços de saúde e ausência da mãe no domicílio.



**Palavras-chave:** Desnutrição. Saúde da criança. Estado nutricional. Estudos transversais. Antropometria. Epidemiologia nutricional.


## Introduction

A substantial decrease in malnutrition was observed in recent decades in Brazilian children younger than five years[1,2]. However, regional inequalities still exist. The 2006 *Pesquisa Nacional de Demografia e Saúde* (PNDS – National Demographic and Health Survey) revealed that the Northern region of Brazil maintained double the prevalence of height and weight deficit, compared to the Brazilian average[3]. This situation in Northern Brazil is an indication of the vulnerability of children to conditions of poverty, household food insecurity and poor access to health services[4,5,6]. In this sense, these indicators suggest an unsatisfactory situation that does not enable child malnutrition to decrease. Due to the lack of population-based studies in the Northern region, little is known about the determinants of child health profile in different contexts, which can be different from those observed in other Brazilian regions.

Public policies to prevent and reduce child malnutrition must be developed considering regional characteristics. However, in the state of Acre, there are few population-based studies on factors associated with child malnutrition that can help to design and adapt public policies aimed at improving child nutritional status. This information is key to develop and implement programs aimed at family empowerment, thus promoting health in the family context with an impact on child malnutrition prevention.

As a result, the present study aimed to investigate the prevalence of malnutrition in children younger than 60 months and associated factors, in two cities of the state of Acre.

## Methods

A population-based cross-sectional study was conducted. The study population was comprised of children younger than 60 months, living in urban areas of the cities of Acrelândia and Assis Brasil, in the state of Acre, Brazil. According to the census

based on records of the *Programa de Saúde da Família* (PSF – Family Health Program), conducted in December 2002 and with a full coverage of all families living in the urban area of both cities, there were 334 homes in Acrelândia and 157 homes in Assis Brasil, totaling 724 children. These children were located using the PSF census records of both cities studied. In 2002, there were only PSF clinics in urban areas and, due to difficulties in logistics and access, the rural areas were not included in the present survey. The exclusion criterion was the presence of any diseases that prevented anthropometric measurement.

Data collection occurred during January 2003. The field team was comprised of community health agents, undergraduate nursing students of the *Universidade Federal do Acre* and postgraduate students of the *Universidade de São Paulo*, trained and supervised locally by project team researchers. During home visits, interviewers introduced themselves, explained the objectives and benefits of the study and requested that an informed consent form be signed by the parents or those responsible for the children, guaranteeing anonymity of information.

The present study was approved by the Human Research Ethics Committee of the *Faculdade de Saúde Pública da Universidade de São Paulo* (Research Protocol 810). Children diagnosed with parasite infection and anemia in this study received adequate drug treatments, prescribed by the project's medical team.

The following information was obtained from the structured questionnaire, applied to parents or those responsible for the children in the home interviews: demographic characteristics (sex and age of children), household goods, number of younger siblings, biological parents' residence status in the home, father's or stepfather's level of literacy, presence of open sewage in the home environment, type of water supply in the home, weight at birth (obtained from the child health report card), maternal reproductive history, characteristics at birth, maternal breastfeeding and previous morbidities. Diarrhea was defined as the frequent passage or loss of liquid feces in the 15 days prior to interview. The household wealth index was calculated (in Z-scores) to evaluate the socioeconomic level of families, based on the presence of household goods and appliances in the homes (television, sound system, VCR, stove, fridge, radio, telephone, bicycle, electric iron, blender, car, couch, washing machine and satellite dish antenna), according to what had been described in previous studies[7,8]. In brief, scores originated from main component analysis were added, using household goods as the basis for the calculation and estimating the household wealth index, as recommended by Filmer & Pritchett[9].

Peripheral blood samples of children aged between 6 and 60 months were collected with a portable hemoglobinometer (Hemocue®, Ängelhom, Sweden) to quantify hemoglobin concentration. Anemia cases were defined by values lower than 11.0g/100ml, as established by the World Health Organization (WHO)[10].

Weight and height measurements of children aged two years or more were taken. Weight was measured with a portable electronic scale (Plenna, USA) with a 150kg capacity and 100g accuracy. Height was measured using a stadiometer with a 0.1cm accuracy. Children younger than two years had their weight and height measured with a digital pediatric scale, with a 16kg capacity and 10g accuracy (Soehnle, Germany) and a child anthropometer (0.1cm accuracy), respectively. anthropometric measurements were obtained in duplicate by research team nutritionists (TGC and PTM), using the mean between two measurements, observed according to the procedures recommended by the WHO[11]. With the help of the WHO Anthro 2005 software, Z-scores of the height-for-age and weight-for-height indices were obtained from the WHO's 2006 child growth standard[12]. A cut-off point equal to or lower than a Z-score of –2 was used to determine nutritional deficits[11]. Extreme values below a Z-score of -6 and above +6 for anthropometric indices were

excluded from data analysis, as recommended by the WHO[12].

Data were typed into the Epi-Info software program, version 6.01, following the double-entry procedure. After this process, data were transferred to the Stata™ statistical software program, version 9.2, for statistical analysis. Chi-square test for homogeneity was used to compare proportions ($p<0.05$).

Factors associated with child malnutrition were identified in two stages. In the initial analysis, independent variables associated with nutritional deficits with a p value<0.20 (chi-square test for homogeneity and linear trend) were selected to comprise the multiple models. In the second stage, the factors associated with height-for-age and weight-for-height deficits were identified with hierarchical and multiple Poisson regression analysis (robust standard error), using a conceptual model and procedures adapted from previous publications[13,14,15]:

- 1st block: city of residence and demographic characteristics ("city", "child sex", and "child age" variables);
- 2nd block: socioeconomic characteristics ("household wealth index", "father's or stepfather's level of literacy" variables);
- 3rd block: access to child care and services ("living with biological parents", "having younger siblings", "open sewage" and "water supply" variables);
- 4th block: birth characteristics ("weight at birth" variable);
- 5th block: morbidities ("anemia" and "diarrhea in the 15 days prior to interview" variables).

Multiple model analysis began from the distal block to the proximal block. Child sex and age were included into the first block and remained in the subsequent stages. All variables selected in the first stage were included inside each block. Variables with a p value<0.05 using the Wald test or linear trend were selected as a factor associated with nutritional deficits, remaining in the multiple models in the analyses of subsequent blocks. Variables with a p value>0.05 were excluded from the model and changes higher than 10% in the magnitude of prevalence ratios of variables remaining in the model were evaluated. In cases of occurrence of changes in prevalence ratio higher than 10% in the variables remaining in the model, the variable was reinserted and maintained in the multiple models of subsequent blocks.

## Results

Of all 720 children younger than 60 months, whose parents agreed to participate in the study (99.4% of those eligible), 677 completed the physical exam. Of these, 10 children were excluded because they had Z-score values lower than -6 or higher than +6 for the anthropometric indices evaluated. Thus, 667 children were considered in this analysis, corresponding to 92.2% of all eligible children in this study. Of all 667 children, 329 (49.3%) were males and 338 (50.7%) were females. With regard to age, 246 (36.9%) were aged between 0 and 23 months and 421 (63.1%), between 24 and 60 months.

The magnitudes of prevalence were 9.9% (CI95%: 7.6-12.1) for the height-for-age deficit and 4.1% (CI95%: 2.5-5.5) for the weight-for-height deficit. Maternal breastfeeding began for the majority of children studied (97.5%), although the prevalence of exclusive breastfeeding until the sixth month was 33.6%, including a median of total duration of breastfeeding of 180 days, without significant statistical differences between cities. The distributions of children younger than 60 months, according to city of residence, socioeconomic conditions, access to child care and services, weight at birth and morbidities are shown in Table 1. "Living with the biological parents" and "weight at birth" were selected to comprise the multiple models of height-for-age and weight-for-height deficits. In contrast, "household wealth index", "father's or stepfather's level of literacy", "having younger siblings", "open sewage", "anemia" and "diarrhea in the 15 days prior to interview" were selected to comprise the multiple model for height-

-for-age deficit. In the multiple model for weight-for-height deficit, "water supply" was also selected (Table 2).

Table 3 shows the factors associated with height-for-age deficit in the final multiple models. In the socioeconomic block, chil-

**Table 1** - Distribution of children under 60 months by municipality of residence, socioeconomic conditions, access to services and child care, birth weight and morbidity. Assis Brasil and Acrelândia, AC, 2003.

***Tabela 1*** *– Distribuição das crianças menores de 60 meses segundo município de residência, condições socioeconômicas, acesso aos serviços e cuidado da criança, peso ao nascer e morbidades. Assis Brasil e Acrelândia, AC, 2003.*

| | n | % |
|---|---|---|
| **City** | | |
| Assis Brasil | 197 | 29.5 |
| Acrelândia | 470 | 70.5 |
| **Household wealth index** | | |
| 3rd third (high) | 226 | 34.2 |
| 2nd third | 213 | 32.3 |
| 1st third (low) | 221 | 33.5 |
| **Father's or stepfather's level of literacy** | | |
| Literate | 552 | 89.5 |
| Illiterate | 65 | 10.5 |
| **Living with the biological parents** | | |
| Living with the biological mother and father | 465 | 69.7 |
| Living only with the biological mother | 151 | 22.6 |
| Biological mother not living in the home | 51 | 7.7 |
| **Younger siblings** | | |
| No younger sibling | 300 | 45.4 |
| 1 younger sibling | 273 | 41.4 |
| 2 or more younger siblings | 87 | 13.2 |
| **Open sewage** | | |
| Absent | 507 | 77.3 |
| Present | 149 | 22.7 |
| **Water supply** | | |
| Public network | 402 | 60.9 |
| Other sources (water well, river or dam) | 258 | 39.1 |
| **Weight at birth** | | |
| Higher than 2,500 g | 566 | 91.3 |
| Equal to or lower than 2,500 g | 54 | 8.7 |
| **Anemia** | | |
| Absent | 433 | 71.0 |
| Present | 177 | 29.0 |
| **Diarrhea in the 15 days prior to interview** | | |
| Absent | 466 | 70.2 |
| Present | 198 | 29.8 |

**Table 2** - Prevalence (%) and prevalence ratio (PR) of malnutrition among children under 60 months by municipality of residence, socioeconomic conditions, access to services and child care, birth weight and morbidity. Assis Brasil and Acrelândia, AC, 2003.

***Tabela 2*** *– Prevalência (%) e razão de prevalência (RP) da desnutrição em crianças menores de 60 meses segundo município de residência, condições socioeconômicas, acesso aos serviços e cuidado da criança, peso ao nascer e morbidades. Assis Brasil e Acrelândia, AC, 2003.*

| Variables / Categories | Height-for-age deficit | | | Weight-for-height deficit | | |
|---|---|---|---|---|---|---|
| | % | Crude PR | p | % | Crude PR | p |
| **City** | | | | | | |
| Assis Brasil | 7.6 | 1 | 0.202 | 5.0 | 1 | 0.383 |
| Acrelândia | 10.8 | 1.42 | | 3.6 | 0.71 | |
| **Household wealth index** | | | | | | |
| 3rd third (high) | 7.0 | 1 | 0.017 | 3.5 | 1 | |
| 2nd third | 7.9 | 1.12 | | 4.2 | 1.19 | |
| 1st third (low) | 14.4 | 2.04 | | 4.0 | 1.15 | 0.927 |
| Linear trend p | | | 0.013 | | | 0.767 |
| **Father's or stepfather's level of literacy** | | | | | | |
| Literate | 8.8 | 1 | 0.014 | 4.3 | 1 | 0.630 |
| Illiterate | 18.4 | 2.07 | | 3.0 | 0.70 | |
| **Living with the biological parents** | | | | | | |
| Living with the biological mother and father | 9.4 | 1 | 0.047 | 4.0 | 1 | 0.050 |
| Living only with the biological mother | 7.9 | 0.83 | | 1.9 | 0.48 | |
| Biological mother not living in the home | 19.6 | 2.07 | | 9.8 | 2.39 | |
| **Younger siblings** | | | | | | |
| No younger sibling | 5.6 | 1 | 0.000 | 3.0 | 1 | 0.449 |
| 1 younger sibling | 10.9 | 1.93 | | 4.4 | 1.46 | |
| 2 or more siblings | 20.6 | 3.65 | | 5.7 | 1.91 | |
| Linear trend p | | | 0.000 | | | 0.202 |
| **Open sewage** | | | | | | |
| Absent | 7.3 | 1 | 0.000 | 4.1 | 1 | 0.414 |
| Present | 18.7 | 2.57 | | 2.6 | 0.64 | |
| **Water supply** | | | | | | |
| Public network | 9.2 | 1 | 0.488 | 4.7 | 1 | 0.195 |
| Other sources (water well, river or dam) | 10.8 | 1.17 | | 2.7 | 0.57 | |
| **Weight at birth** | | | | | | |
| Higher than 2,500 g | 9.1 | 1 | 0.078 | 3.1 | 1 | 0.024 |
| Equal to or lower than 2,500 g | 16.6 | 1.81 | | 9.2 | 2.91 | |
| **Anemia** | | | | | | |
| Absent | 8.5 | 1 | 0.038 | 4.6 | 1 | 0.495 |
| Present | 14.1 | 1.65 | | 3.3 | 0.73 | |
| **Diarrhea in the 15 days prior to interview** | | | | | | |
| Absent | 11.5 | 1 | 0.029 | 3.8 | 1 | 0.684 |
| Present | 6.0 | 0.52 | | 4.5 | 1.17 | |

**Table 3** - Factors associated with malnutrition in children under 60 months, using hierarchical multiple regression analysis. Assis Brasil and Acrelândia, AC, 2003.
***Tabela 3*** *– Fatores associados à desnutrição em crianças menores de 60 meses obtidos mediante análise múltipla hierarquizada. Assis Brasil and Acrelândia, AC, 2003.*

| Indicator / Variables / Categories | Adjusted prevalence ratio | (CI95%) | p |
|---|---|---|---|
| **Height-for-age deficit** | | | |
| **Household wealth index*** | | | |
| 3rd third (high) | 1 | | |
| 2nd third | 1.18 | (0.61 ; 2.31) | 0.608 |
| 1st third (low) | 1.74 | (0.95 ; 3.18) | 0.071 |
| Linear trend p | | | 0.067 |
| **Father's or stepfather's level of literacy *** | | | |
| Literate | 1 | | |
| Illiterate | 1.82 | (1.01 ; 3.27) | 0.046 |
| **Living with the biological parents †** | | | |
| Living with the biological mother and father | 1 | | |
| Living only with the biological mother | 0.56 | (0.24 ; 1.26) | 0.165 |
| Biological mother not living in the home | 2.63 | (1.32 ; 5.24) | 0.006 |
| **Younger siblings †** | | | |
| No younger sibling | 1 | | |
| 1 younger sibling | 1.69 | (0.91 ; 3.12) | 0.094 |
| 2 or more younger siblings | 2.88 | (1.45 ; 5.72) | 0.003 |
| Linear trend p | | | 0.004 |
| **Open sewage †** | | | |
| Absent | 1 | | |
| Present | 2.46 | (1.51 ; 4.00) | 0.000 |
| **Weight-for-height deficit** | | | |
| **Weight at birth *** | | | |
| Higher than 2,500 g | 1 | | |
| Equal to or lower than 2,500 g | 2.91 | (1.16 ; 7.24) | 0.022 |

* Adjusted for sex and age / *Ajustado para sexo e idade*
† Adjusted for sex, age, wealth index and literacy of the father or stepfather / *Ajustado para sexo, idade, índice de riqueza e alfabetização do pai ou padrasto*

dren whose father or stepfather was illiterate showed a greater magnitude of association with height-for-age deficit, when compared to others whose father or stepfather was literate. The exclusion of "household wealth index" from the multiple model reduced the prevalence ratio of "having a literate father or stepfather" by more than 10%. Thus, "household wealth index" remained in the multiple model as a factor associated with height-for-age deficit. In the block of access to child care and services, the fact of a child living without the biological mother showed double the magnitude of association with the height-for-age deficit. A linear relationship was found between a higher number of younger siblings and height-for-age deficit (linear trend p=0.004). In addition, "home environment being exposed to open sewage" doubled the magnitude of association with height-for-age deficit.

In the hierarchical multiple analysis of

weight-for-height deficit, only the "weight at birth" variable was found to be an associated factor. Low weight at birth was associated with an increase in the prevalence of weight-for-height deficit by approximately three times. After adjustment for sex and age, the prevalence ratio of low weight at birth remained similar to that identified in the crude analysis. "Diarrhea in the 15 days prior to interview" and "anemia" did not remain in the final multiple model for height--for-age deficit, after adjustment of variables from previous blocks, because they did not show statistical significance ($p<0.05$). In the analysis of weight-for-height deficit, after adjustment for sex and age, "living with the biological parents" and "water supply" did not show statistical significance ($p<0.05$) and were excluded from the multiple model.

There were no statistically significant differences between cities for the variables investigated, except for "number of younger siblings" (proportion of two or more younger siblings: Acrelândia 16% and Assis Brasil 6.1%, p=0.016) and "water supply" (proportion of homes with public water supply: Acrelândia 54% and Assis Brasil 77%, p=0.000). The inclusion of a city as an adjustment/control variable in all blocks did not change the variables selected in the final model (data not shown).

## Discussion

In the present study, the prevalence of height-for-age deficit was an important public health problem in the cities studied, with a general prevalence of 9.9%. Factors associated with height-for-age deficit were as follows: low household wealth index, having an illiterate father or stepfather, biological mother not living in the home, having two or more younger siblings, and being exposed to open sewage in the home environment. With regard to the weight-for--height deficit, with a general prevalence of 4.1%, the only associated factor was "low weight at birth". This is the first investigation conducted in Northern Brazil that estimated nutritional deficits, using the new benchmark of the WHO's 2006 growth standard. The height-for-age deficit was found to be an important nutritional problem in the cities studied.

Compared to recent information from the 2006 PNDS, the prevalences of nutritional deficits found in the present study were higher than the general Brazilian prevalence of height-for-age deficit (7.0%) and weight-for-height deficit (1.98%) in children younger than 60 months[3]. Vulnerability of children to socioeconomic inequalities and the characteristics inherent in the family structure are important factors associated with child malnutrition in the cities studied.

On the distal level, having an illiterate father or stepfather was associated with height-for-age deficit in the cities studied, corroborating findings from a previous study conducted in Southern Brazil[16]. This association could be the result of the father's or stepfather's limited ability to help the mother with their children's adequate health and food habits, due to the difficulty in understanding the information provided by health services or originated from other sources[17]. Thus, the father's or stepfather's reduced length of time of study can also influence the acquisition of household goods or allocation of income aimed at child care.

The great difference between high-income and low-income families in the cities analyzed, with regard to the prevalence of height-for-age deficit of children, was consistent with national studies[1,18]. Monteiro et al.[1], while analyzing data from the 1996 and 2006-2007 PNDS, observed that the strata with lower per capita household income had a higher prevalence of height-for-age deficit and that an increase in maternal level of education ("proportion of mothers with complete primary education" indicator) and in the purchasing power of poorer families explained 25.7% and 21.7% of the decrease in the prevalence of height-for-age deficit in the country, respectively. Thus, as income is a key aspect for the acquisition of goods and access to services, the high proportion of poverty in the state of Acre can be considered the main determinant of high prevalence of

malnutrition observed in the present study.

With regard to child care, Thomas[19] analyzed data from the 1989 national survey, suggesting that income controlled by mothers had a greater positive effect on the child's height-for-age index, compared to income controlled by fathers. In addition, this author evidenced that mothers allocated more resources to buy foods than fathers. Likewise, couples living in the Northeast region of Brazil also indicated that fathers are responsible for the family's economic issues, whereas food care is attributed to mothers[20]. Considering these circumstances, the fact that the biological mother does not live in the home, as observed in the present study, indicates a vulnerable situation involving the child's inadequate nutritional status.

On the other hand, children from Assis Brasil and Acrelândia who only live with the biological mother did not show statistically different prevalences of nutritional deficits, when compared to children who lived with the biological mother and father. However, the fact of a child only living with the biological mother did not exclude the possibility of their living with the stepfather or other family members. Likewise, Carvalhaes & Benício[21] observed that, in the city of Botucatu, state of São Paulo, 90% of mothers living without a partner resided with other family members. In this sense, living with family members strengthens the social support network for child care[22,23], enabling emotional support and helping with this child care. Moreover, the presence of the mother's partner in the home increases access to household goods and essential services for adequate child nutritional status[21,24,25,26].

Evidence of a higher number of younger siblings being associated with height--for-age deficit suggests an increase in household spending and reduction in time and resources allocated for child care. In this sense, Eastwood & Lipton[27] reported that high fertility has a great impact on household income, especially in families living below the poverty line.

With regard to access to services, the present study revealed that child malnutrition was associated with the presence of open sewage. In 2000, it was estimated that only 34% of homes in the state of Acre were connected to the general water supply network and that 17.6% of homes were connected to the general sanitary sewage network[6]. National data also showed an association between inadequate basic sanitation conditions and child malnutrition[28,29]. On the proximal level, the association between low weight at birth and weight-for-height deficit could reflect the precariousness of health care services for pregnant women in the cities studied. In this sense, according to an observation made during the study in 2003, pregnant women of the cities of Assis Brasil and Acrelândia were treated by only one *Unidade Básica de Saúde* (UBS – Primary Health Unit) in each city studied. Moreover, in this same year, a UNICEF report stated that 20.2% of pregnant women did not have prenatal consultations in the state of Acre[30].

The cross-sectional design of the present study prevented the identification of temporality between independent variables and nutritional deficits. However, information was collected from direct observation and report of a recent occurrence. Thus, it could be inferred that the occurrence of memory bias for the main variables analyzed is unlikely.

In conclusion, results of the present study are expected to contribute to the implementation of public policies aimed at the reduction in malnutrition of children younger than 60 months, in the cities of Acrelândia and Assis Brasil, in the state of Acre.

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