

CHAPTER 8:

HUNGER SCALE

QUESTIONNAIRE:

A MEASURE OF HUNGER

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INTRODUCTION

The phenomenon loosely labeled *hunger* in the 1980's is now being discussed as food security or insecurity. Food security is defined as access by all people at all times to enough food for an active healthy life and as a minimum includes the following:

- the ready availability of nutritionally adequate and safe foods; and
- the assured ability to acquire personally acceptable foods in a socially acceptable way¹.

Food insecurity exists whenever food security is limited or uncertain. The measurement of food insecurity at the household (HH) or individual level involves the measurement of those quantitative, qualitative, psychological and social or normative parameters that are central to the experience of food insecurity, qualified by their involuntary nature and periodicity^{1,2,3}. Risk factors for food insecurity include any factors that affect HH resources and the proportion of those resources available for food acquisition. Potential consequences of food insecurity include hunger, malnutrition and (either directly or indirectly) negative effects on health and quality of life³. The precise relationships between food insecurity, its risk factors and its potential consequences are in need of much more research now that there is a measure of emerging consensus on the definition and measurement of food insecurity. Indicators of food security or insecurity are increasingly being proposed as a necessary component of the core measures of the nutritional status of individuals, communities and nations⁴.

Within the design framework of the present survey, it was deemed necessary to include a means of estimating hunger and food insecurity not only for the purpose of having some additional indirect means of reflecting on the dietary as well as on the food procurement and HH inventory data of the survey, but also because no such data are available in children on a national basis. The findings on hunger and food insecurity form the subject of this Chapter of the report.

METHODOLOGY

The Community Childhood Hunger Identification Project Hunger index

A questionnaire-based measure was used to determine domestic hunger using the data from the Community Childhood Hunger Identification Project (CHHIP) as part of the survey. The definition of hunger offered by CHHIP focuses on food insufficiency due to constrained resources³. The validation findings of the CHHIP hunger index reported in the literature have been shown to meet internal and external criteria within a theoretical model of domestic hunger. The CHHIP hunger index measured by an additive scale, can, therefore, be regarded as sufficiently sensitive to identify chronic or subclinical undernutrition among poor families, at least as it relates to poor families in the United States specifically.

The CHHIP hunger index is a scale composed of eight questions that investigate whether adults and/or children in the HH are affected by food insecurity, food shortages, perceived food insufficiency or altered food intake due to constraints on resources. In addition, for each aspect of hunger [i.e. in all eight main questions (Qs) of the questionnaire], two “sub-questions” were asked in order to determine the extent of such food insecurity over 30 days. These questions determine the temporal severity [Qs n(a)] and periodicity [(Qs n(b))] of the hunger problem as follows:

Hunger Items in CHHIP Questionnaire

- **HH level insecurity**
- ***Food uncertainty component***
 - Q1** Does your HH ever run out of money to buy food?
 - (a)** In the past 30 days?
 - (b)** 5 or more days in the past 30 days?
- ***Qualitative component***
 - Q2** Do you ever rely on a limited number of foods to feed your children because you are running out of money to buy food for a meal?
 - (a)** In the past 30 days?

(b) 5 or more days in the past 30 days?

- **Individual level insecurity**

- **Quantitative component**

Q3 Do you ever cut the size of meals or skip because there is not enough money for food?

(a) In the past 30 days?

(b) 5 or more days in the past 30 days?

Q4 Do you ever eat less than you should because there is not enough money for food?

(a) In the past 30 days?

(b) 5 or more days in the past 30 days?

- **Child hunger**

- **Quantitative component**

Q5 Do your children ever eat less than you feel they should because there is not enough money for food?

(a) In the past 30 days?

(b) 5 or more days in the past 30 days?

Q6 Do your children ever say they are hungry because there is not enough food in the house?

(a) In the past 30 days?

(b) 5 or more days in the past 30 days?

Q7 Do you ever cut the size of your children's meals or do they ever skip meals because there is not enough money to buy food?

(a) In the past 30 days?

(b) 5 or more days in the past 30 days?

Q8 Do any of your children ever go to bed hungry because there is not enough money to buy food?

(a) In the past 30 days?

(b) 5 or more days in the past 30 days?

Data Collection

For the purposes of the survey, the hunger questionnaire [CHHIP hunger index; referred to as the Hunger Scale Questionnaire (HSQ) in the rest of this chapter as well as throughout the report] was translated and was available in all the official South African languages. The field workers were trained and tasked to explain to the mother/caregiver as to how to fill in the questionnaire as well as to check for completeness once the questionnaire had been completed. If the mother/caregiver was illiterate, the questions were read out to the interviewee. The fieldworker then entered the answers on the questionnaire.

Data Analysis

A score of five or more, i.e. five affirmative/positive (Yes) responses out of a maximum possible of eight (the eight questions in the HSQ) indicated a food shortage problem affecting everyone in the HH. These families could be considered as "hungry". A score of one to four indicated that the family was at "risk of hunger". A negative response (No) was assumed to mean a food secure HH. Further analysis of the data included the frequency of an affirmative or negative (Yes or No) response for each of the eight questions in the HSQ. The Kruskal-Wallis test was used to test for the significance of the findings and the Bonferroni test for the direction of the significance between the various within-group comparisons.

RESULTS

At the national level, one out of two HHs (52%) experienced hunger [HSQ score ≥ 5 affirmative (Yes) responses], one out of four (23%) were at risk of hunger [HSQ score 1 - 4 affirmative (Yes) responses] (Figure 8.1; Table 8.1) and only one out of four HHs (25%) appeared food secure [HSQ score zero affirmative (Yes) responses]. In the rural areas a significantly (Chi-square; $p < 0.001$) higher percentage (62%) of HHs experienced hunger when compared with HHs in the urban areas (41%). HHs in informal urban and tribal areas as well as on commercial farms were the worse affected. The prevalence of hunger or being at risk of hunger was similar in all HHs irrespective of the age of the child (Figure 8.2; Table 8.2). At the provincial level, HHs in the Eastern

Cape had the highest percentage of hunger (83%), followed by the Northern Cape (63%), North West (61%), Northern Province (54%) and Mpumalanga (53%), (Figure 8.3; Table 8.3). The differences in the prevalence of hunger between Provinces were significant ($p < 0.001$).

Figure 8.1 The percentage of interviewees who responded affirmatively (Yes) to the questions of the HSQ nationally and by area of residence: South Africa 1999

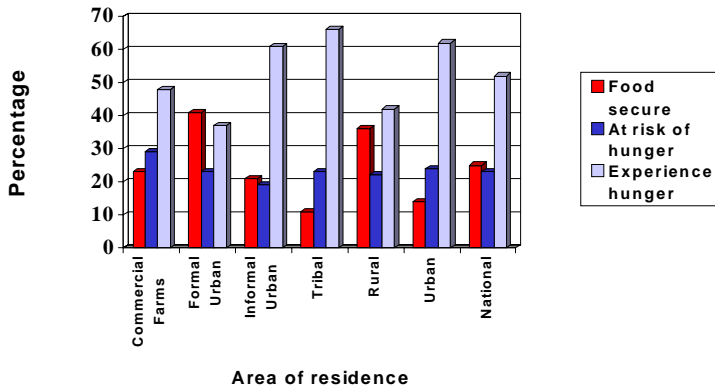


Figure 8.2 The percentage of interviewees who responded affirmatively (Yes) to the questions of the HSQ by the age group of the child: South Africa 1999

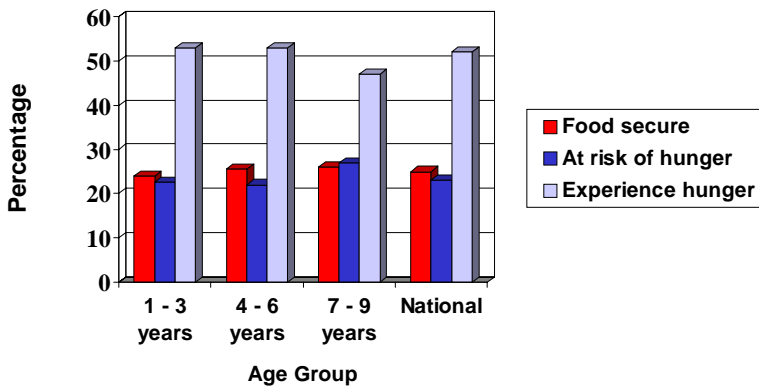
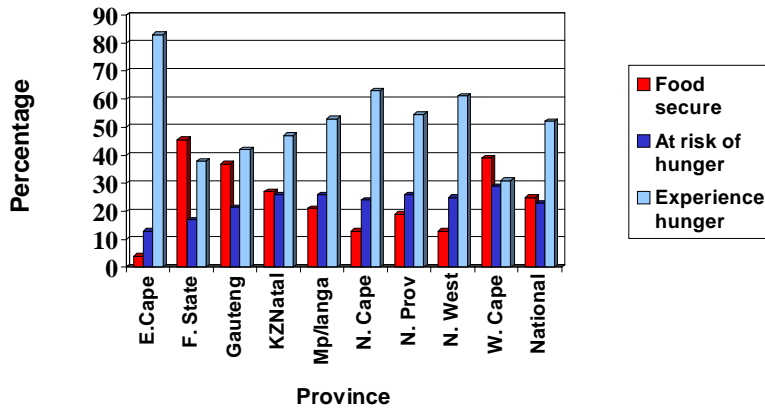
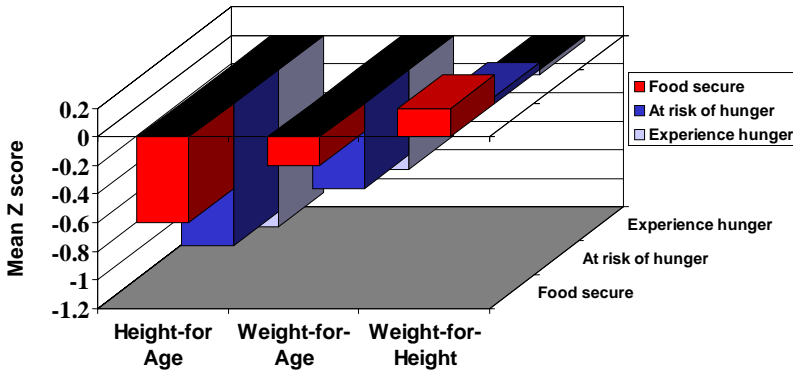


Figure 8.3 The percentage of interviewees who responded affirmatively (Yes) to the questions of the HSQ by province: South Africa 1999



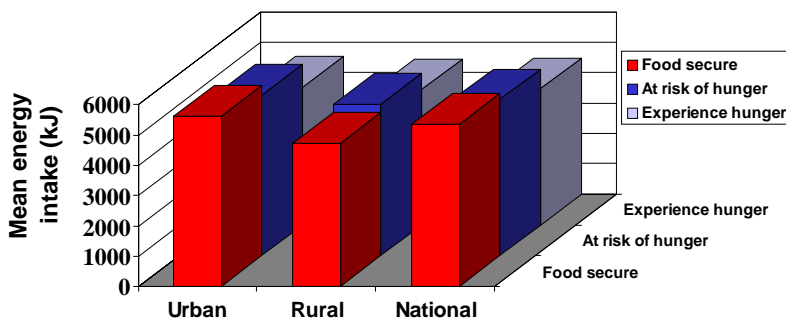
Although the methodology employed for this section of the survey has been validated^{1,4} in the literature, it can be argued that the nature of the questions asked were, indeed, of a subjective nature and could be open to varying interpretations by different people. In order to impart a greater measure of objectivity, the HSQ data was further analysed in relation to the anthropometric data as well as to selected dietary intake, food procurement and HH inventory data, and to selected parameters in the socio-demographic questionnaire (SDQ). In this regard, at the national level, a significantly ($p < 0.001$) poorer anthropometric status was found in HHs at risk of hunger or experiencing hunger as determined on the basis of the interviewee's response (Figure 8.4; Table 8.4). This trend was significant for stunting for HHs in urban and formal urban areas as well as for HHs on commercial farms. In the case of underweight and wasting, this trend was significant for HHs in urban and formal urban areas only (Table 8.4). Although the mean Z scores did not differ significantly across the age groups, there was a significant difference ($p < 0.01$; 0.05) between the mean Z score of children in HHs at risk of hunger or experiencing hunger and food secure HHs (Table 8.5). Provincially, the association of hunger risk classification and anthropometric status was significant only in Gauteng, KwaZulu/Natal and the Western Province (Table 8.6).

Figure 8.4 Hunger risk classification as related to anthropometric status nationally in children aged 1- 9 years: South Africa 1999



At the national level, the energy intake of children was the lowest in the HHs that experienced hunger (Figure 8.5; Table 8.7). This was the case in all areas of residence. Children in such HHs in the rural areas had a lower energy intake, the lowest of which was recorded in children living in HHs on commercial farms (Table 8.7).

Figure 8.5 Hunger risk classification as related to the intake of energy nationally and by area of residence in children aged 1- 9 years: South Africa 1999



A similar trend in relation to hunger risk classification was seen for the intake of vitamins A, calcium as well as for iron and zinc (Figures 8.6 –8.7; Tables 8.7 - 8.8).

Figure 8.6 Hunger risk classification as related to the intake of selected micronutrients nationally in children aged 1- 9 years: South Africa 1999

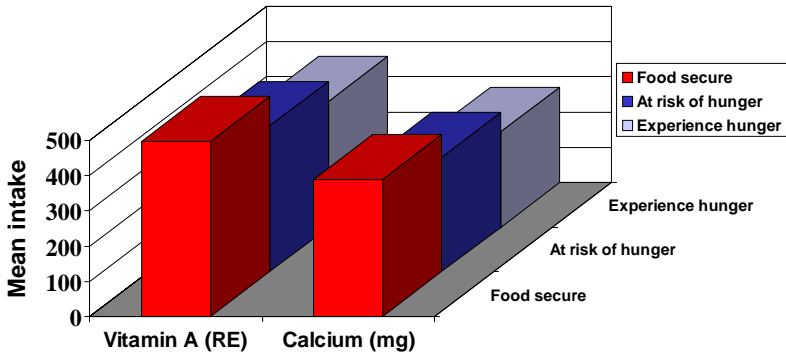
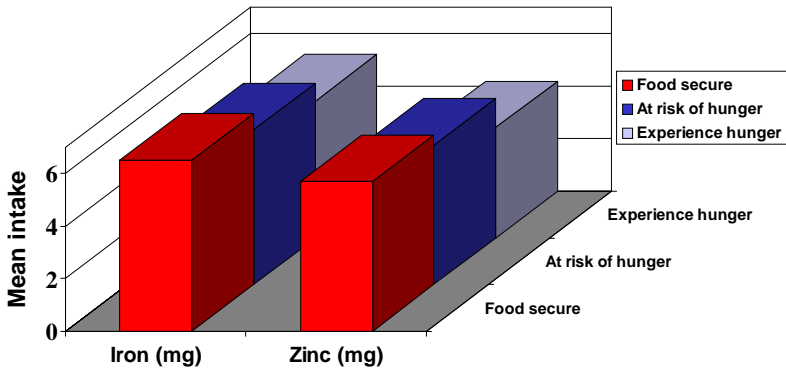


Figure 8.7 Hunger risk classification as related to the intake of selected micronutrients nationally in children aged 1- 9 years: South Africa 1999



Similarly in terms of age, the lowest energy and micronutrient intake was recorded for children in HHs that experienced hunger, irrespective of age (Tables 8.9 –8.10) or Province (Tables 8.11 – 8.12).

Inhabitants of HHs on commercial farms who experienced hunger procured the smallest number of food items, a pattern that was true for all rural when compared with urban areas of residence (Figure 8.8; Table 8.13). HHs in the rural areas also procured the smallest number of dairy products and food items of animal origin (Table 8.13). This was also the trend for HHs with children of any age in the 1- 9 years age group (Table 8.14) as well as for all Provinces (Table 8.15). This trend was almost identical for the items found in the HH inventory (Figure 8.9; Table 8.16 – 8.18).

Figure 8.8 Hunger risk classification as related to food procurement nationally and by area of residence in children aged 1- 9 years: South Africa 1999

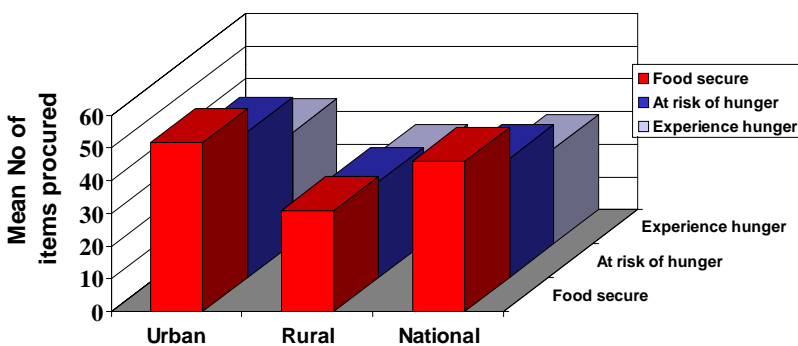
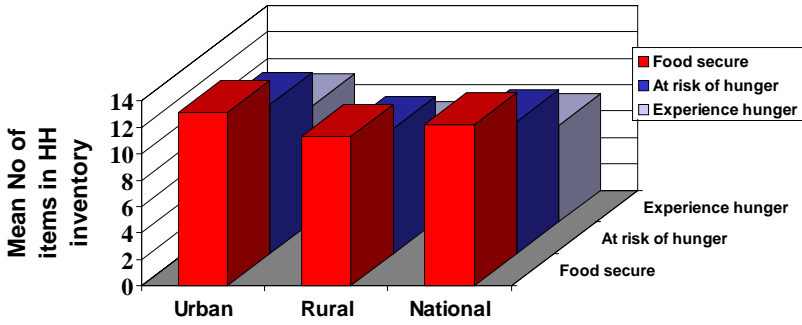


Figure 8.9 Hunger risk classification as related to HH inventory nationally and by area of residence in children aged 1-9 years: South Africa 1999



Nationally, HHs that experienced hunger tended to be of the informal dwelling type irrespective of area of residence or Province (Figure 8.10; Tables 8.19 – 8.20). Similarly, the level of maternal education was lower in such HHs (Figure 8.11; Tables 8.19 – 8.20).

Figure 8.10 Hunger risk classification as related to the type of dwelling nationally and by area of residence in children aged 1-9 years: South Africa 1999

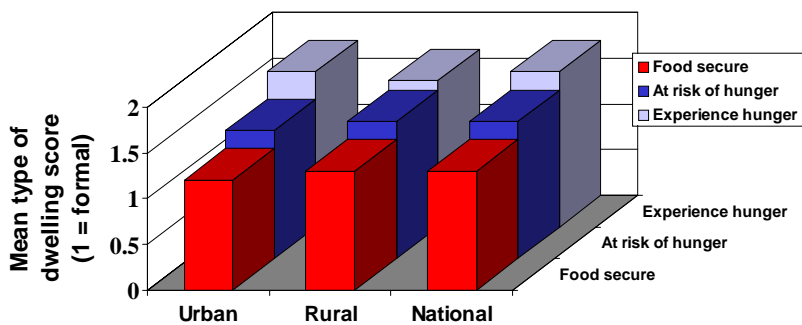
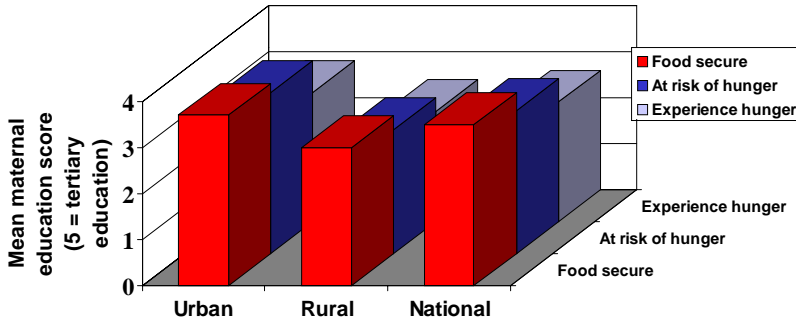


Figure 8.11 Hunger risk classification as related to level of maternal education nationally and by area of residence in children aged 1- 9 years: South Africa 1999



In terms of income, HHs that experienced hunger had the lowest monthly income and spent the smallest amount on food weekly (Figures 8.12 – 8.13; Tables 8.21 – 8.22).

Figure 8.12 Hunger risk classification as related to monthly HH income nationally and by area of residence in children aged 1- 9 years: South Africa 1999

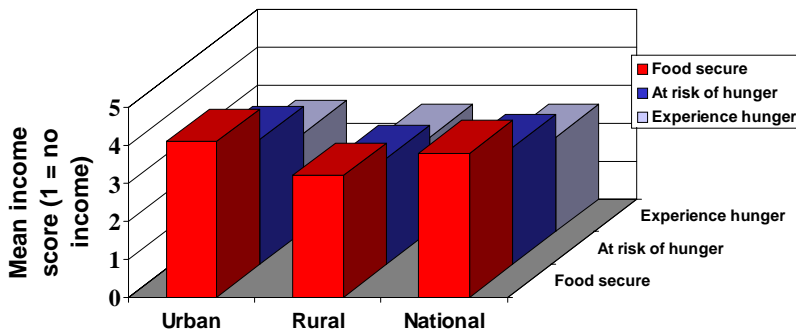
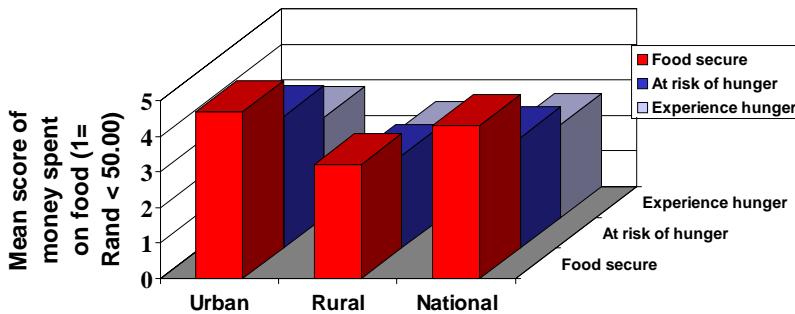


Figure 8.13 Hunger risk classification as related to the amount of money spent on food per week nationally and by area of residence in children aged 1- 9 years: South Africa 1999



This was the trend in all areas of residence and in all Provinces. It is interesting to note that HHs in the rural areas had the lowest scores for income and the smallest amount spent on food weekly (see footnote on Tables 8.21 – 8.22 for income “score”). It is also of interest to note that in such HHs the differences in the income score tended to be smaller between food secure and at risk of hunger HHs when compared with HHs that experienced hunger.

The HSQ data were also analysed in relation to anthropometric status as well to selected dietary, food consumption and HH inventory data for all eight questions of the questionnaire [affirmative (Yes) responses for each question] individually by the area of residence, by age group and by Province.

Questions 1 and 2 measured food security at the HH level (a food uncertainty component and a qualitative component respectively). With regard to the food uncertainty component at the national level (question 1), seven out of ten HHs did not have sufficient money to buy food (Table 8.23). In six out of ten HHs this was the case in the month preceding the interview, and in one out of two HHs this had occurred on five or more days in the past month (Table 8.23). Rural areas and all areas of residence, except formal urban, were the worst affected. This pattern and its extent was true for all age groups (Table 8.24). Provincially, the Eastern Cape, Northern Cape, Northern Province and North West were the

worst affected Provinces (Table 8.25). With regard to the qualitative component (question 2), a similar pattern emerged and although the extent was more variable, it was not significantly different (Tables 8.26 –8.28).

Questions 3 and 4 measured food security at the individual level, which referred to the mother's/caregiver's experience. At the national level, one out two (54%) mothers/caregivers either cut the size of meals or skipped meals or ate less than they should due to a lack of food in the house (Table 8.29). Indeed, four out of ten mothers/caregivers resorted to such practices on five or more days in the month preceding the interview. Mothers/caregivers in all rural and informal urban areas were the worst affected (Table 8.29). This was the case for mother/caregivers of children of all age groups (Table 8.30), with the Eastern Cape and Northern Province being the worst affected (>50%) Provinces (Table 8.31). A very similar pattern was found in the replies given by the mothers/caregivers who had to eat less because there was not enough money to buy food (Tables 8.32 – 8.34).

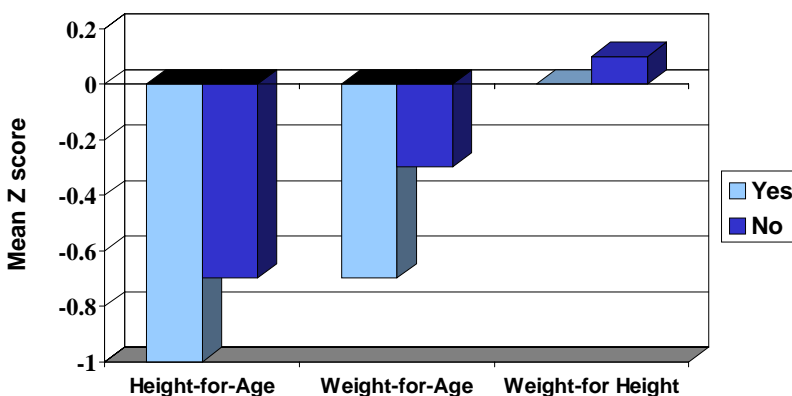
Questions 5, 6, 7 and 8 measured child hunger as perceived by the mother/caregiver. One out of two children nationally were reported to have eaten less than they should because there was not enough money to buy food during the month preceding the interview (Table 8.35). Indeed, in one out of three children this occurred on five or more days during the preceding month, a pattern that was similar for children of age groups (Table 8.36) and in eight of the nine Provinces (Table 8.37). In terms of hunger perceived to be expressed by children due to insufficient food in the HH, the pattern was very similar, with four out of ten children having experienced hunger (Table 8.38), in all three age groups (Table 8.39) and in six of the nine Provinces (Table 8.40). The pattern was remarkably similar for children having a meal of a smaller size or skipping a meal because of insufficient money to buy food (Tables 8.41 – 8.43). Furthermore, approximately one out of three mothers/caregivers nationally indicated that their children had to go to bed hungry due to a lack of money to buy food (Table 8.44), a finding that was applicable to one out of five children of all age groups (Table 8.45). The highest percentage of such children was

reported in the North West (46%) the Northern Cape (40%) and Mpumalanga (42%), (Table 8.46).

Importantly, it is of interest to note that, globally, the positive responses on each question revealed the same trend for all the Provinces, namely, that the frequency of an affirmative response by the interviewee to the Food Uncertainty Component [(Question 1: does your HH ever run out of money to buy food?) was the highest, with the temporal severity (Question 1 (a): has it happened in the past 30 days?) being experienced consistently to a lesser extent. Likewise the periodicity and the hunger [Question 1 (b): Has it happened 5 or more days in the past 30 days?) was lower than the temporal severity. This pattern was the same for all the questions and all the “sub-questions” [i.e. Question n(a) and n(b)] in the questionnaire. The differences for all questions were overall statistically significant (Chi Square; $p < 0.001$).

Nationally, the mean Z score (H/A and W/A for question 1 of the HSQ) of children in HHs which replied affirmatively to the HSQ according to its described scoring system, was significantly ($p < 0.001$) lower than children in HHs with negative responses (Figure 8.14; Table 8.47).

Figure 8.14 The anthropometric status nationally in relation to the interviewee’s response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1): Does the household ever run out of money to buy food?]



Interestingly, the most marked differences were seen at the national level and for children living in urban, but not rural, areas. Similarly, children in HHs with affirmative replies had a significantly lower energy intake as obtained by the 24-H-RQ (Figure 8.15; Table 8.48) as well as a lower nutrient intake for vitamin A, vitamin C and calcium (Figure 8.16; Table 8.48), and for iron and zinc (Figure 8.17; Table 8.48). Furthermore, HHs with affirmative responses procured a significantly smaller number of food items and also had a smaller number of food items recorded in the HH inventory (Figure 8.18; Tables 8.49- 8.50). In unison with these findings, the HHs with affirmative responses also procured a smaller number of food items of animal origin and dairy products, and a smaller number of these products were found in the HH inventory (Figure 8.19; Tables 8.49 – 8.50).

Figure 8.15 The energy intake as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1): Does the household ever run out of money to buy food?]

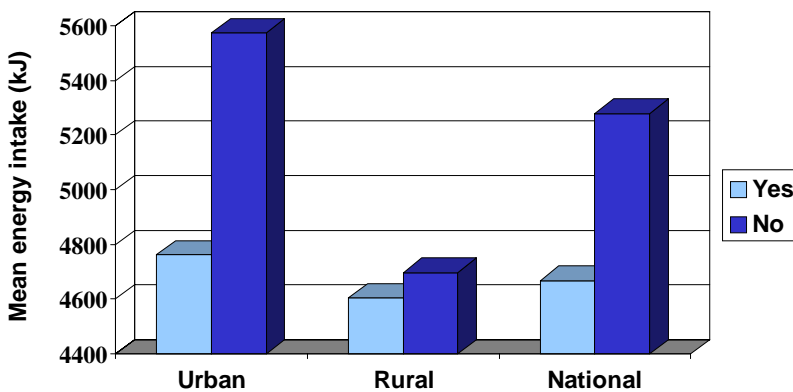


Figure 8.16 The dietary intake of vitamin A, C and calcium as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1): Does the household ever run out of money to buy food?]

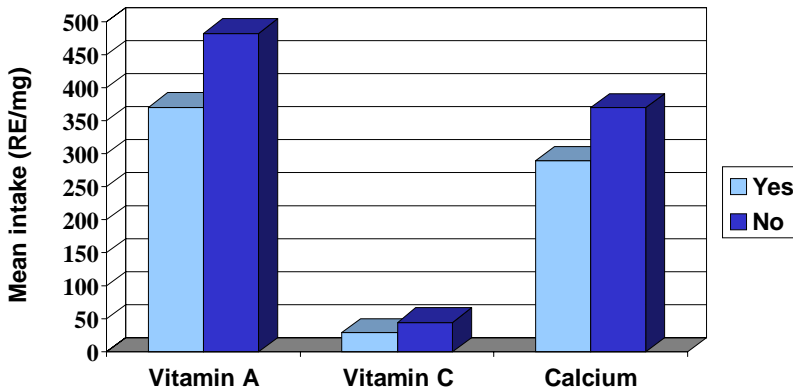


Figure 8.17 The dietary intake of iron and zinc as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1): Does the household ever run out of money to buy food?]

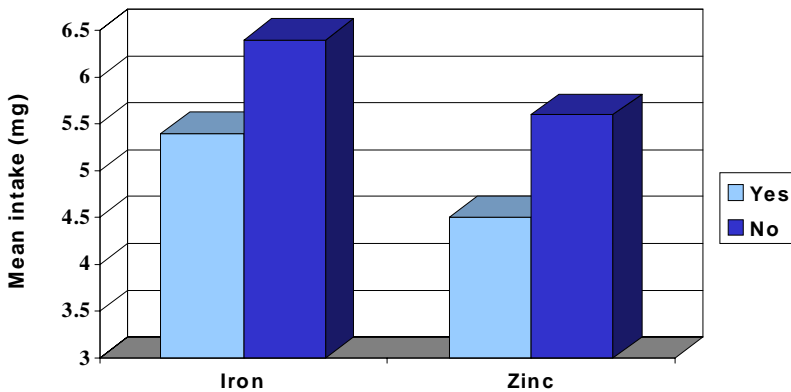


Figure 8.18 The number of food items procured and found in the HH inventory as obtained from the FPHIQ nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1): Does the household ever run out of money to buy food?]

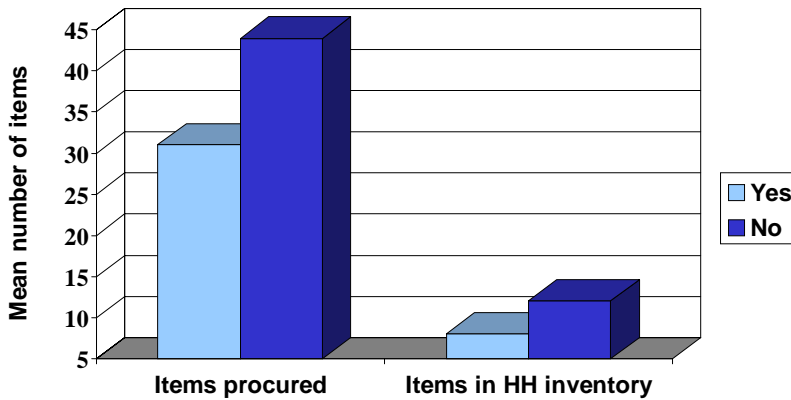
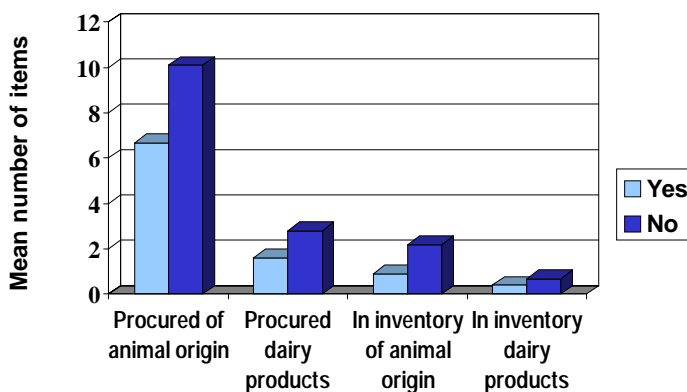


Figure 8.19 The number of selected food items procured and found in the HH inventory as obtained from the FPHIQ nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1): Does the household ever run out of money to buy food?]



A remarkably similar pattern was found for the temporal severity [question 1 (a)], (Figures 8.20 – 8.25; Tables 8.51 – 8.54) and periodicity [question 1(b)], (Figures 8.26 – 8.31; Tables 8.55 – 8.58). This pattern was consistent for all the

parameters selected for this purpose and for all the eight questions of the HSQ (Tables 8.59 – 8.146).

Figure 8.20 The anthropometric status nationally in relation to the interviewee’s response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1a): Does the household ever run out of money to buy food (in the past 30 days)]

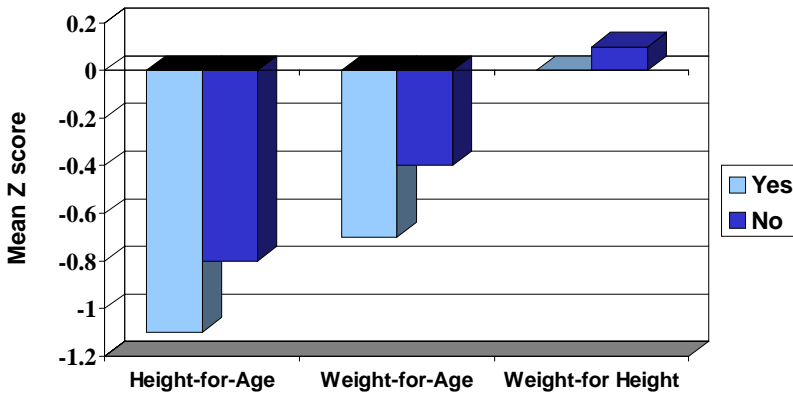


Figure 8.21 The energy intake as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee’s response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1a): Does the household ever run out of money to buy food (in the past 30 days)]

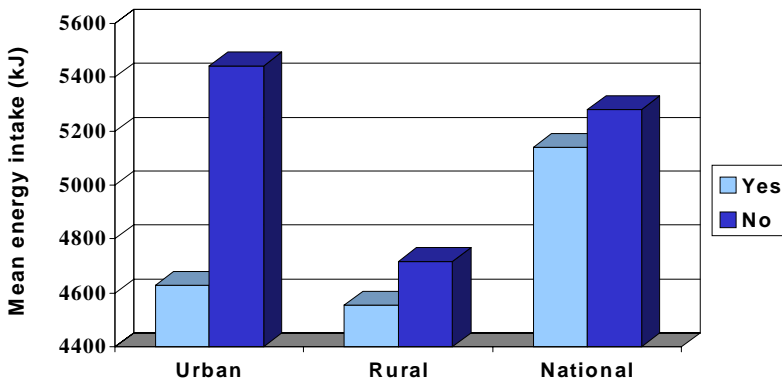


Figure 8.22 The dietary intake of vitamin A, C and calcium as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1a): Does the household ever run out of money to buy food (in the past 30 days)]

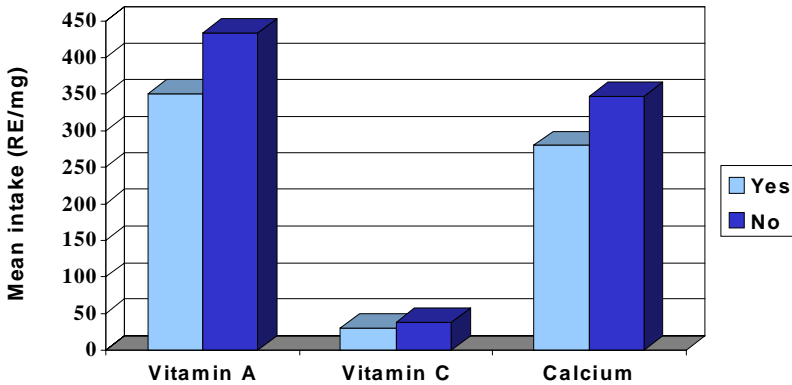


Figure 8.23 The dietary intake of iron and zinc as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1a): Does the household ever run out of money to buy food (in the past 30 days)]

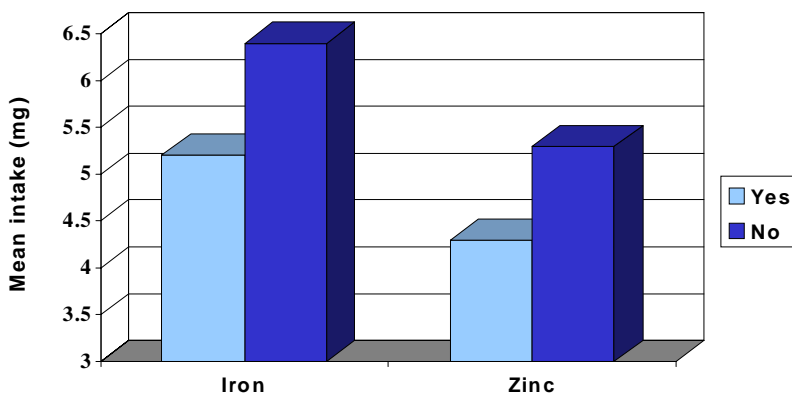


Figure 8.24 The number of food items procured and found in the HH inventory as obtained from the FPHIQ nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1a): Does the household ever run out of money to buy food (in the past 30 days)]

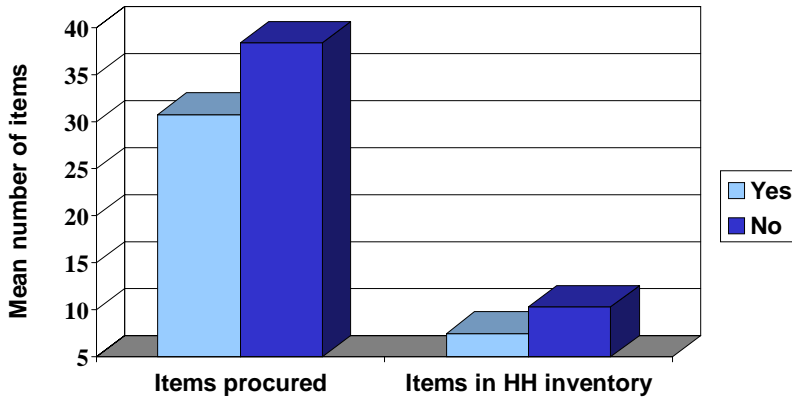


Figure 8.25 The number of selected food items procured and found in the HH inventory as obtained from the FPHIQ nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1a): Does the household ever run out of money to buy food (in the past 30 days)]

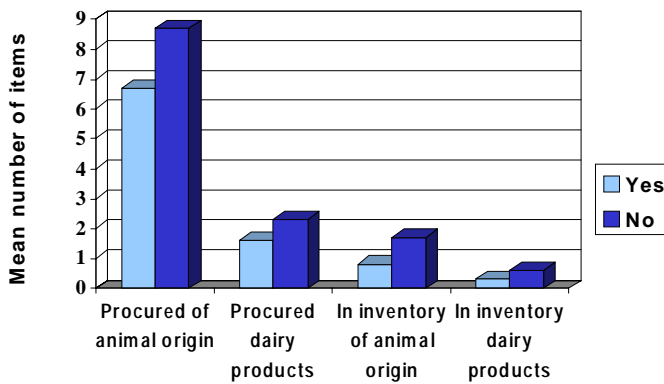


Figure 8.26 The anthropometric status nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1b): Does the household ever run out of money to buy food (5 or more days in the past 30 days)]

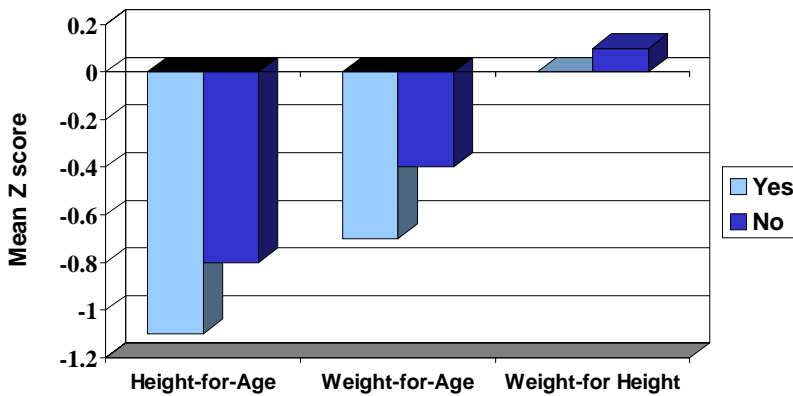


Figure 8.27 The energy intake as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1b): Does the household ever run out of money to buy food (5 or more days in the past 30 days)]

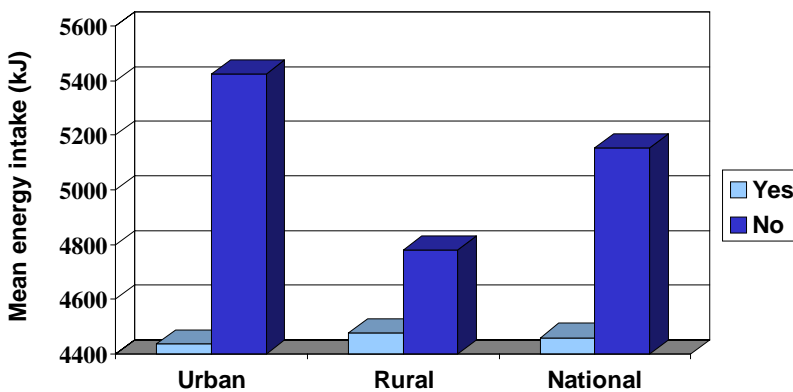


Figure 8.28 The dietary intake of vitamin A, C and calcium as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1b): Does the household ever run out of money to buy food (5 or more days in the past 30 days)]

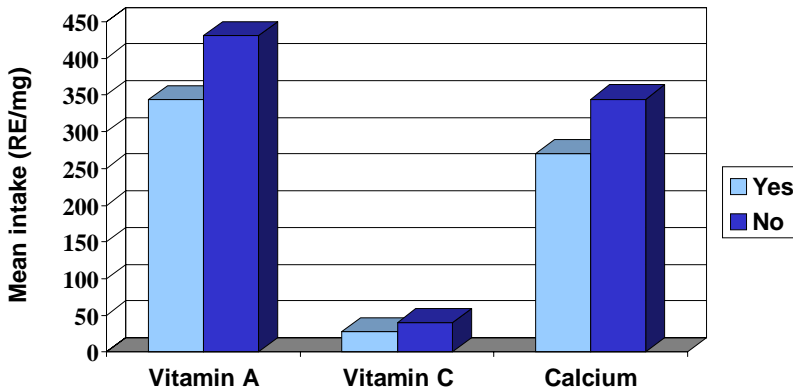


Figure 8.29 The dietary intake of iron and zinc as obtained by the 24-H-R Questionnaire nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1b): Does the household ever run out of money to buy food (5 or more days in the past 30 days)]

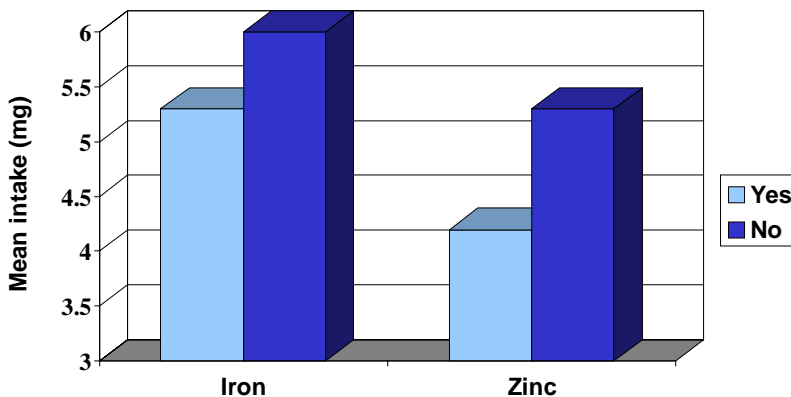


Figure 8.30 The number of food items procured and found in the HH inventory as obtained from the FPHIQ nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1b): Does the household ever run out of money to buy food (5 or more days in the past 30 days)]

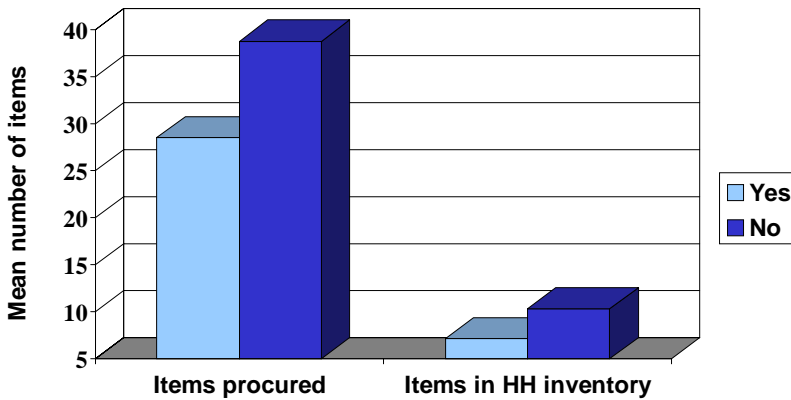
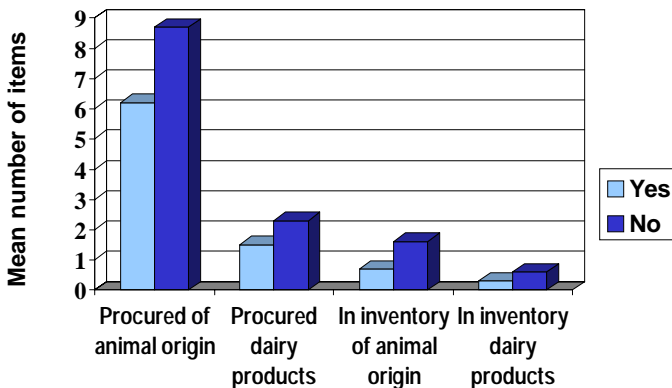


Figure 8.31 The number of selected food items procured and found in the HH inventory as obtained from the FPHIQ nationally in relation to the interviewee's response (Yes/No) to the Hunger Scale Questionnaire: South Africa 1999 [(Question 1b): Does the household ever run out of money to buy food (5 or more days in the past 30 days)]



Importantly, the same relationships were shown for the nutrient intake data as obtained from the QFFQ. The data for the latter questionnaire is not presented in this report in order to keep its size to a manageable level.

Factor analysis of a questionnaire reflects pattern(s) of response(s) to its component, which corresponds to the parameters being measured. Factor analysis of the HSQ (Table 8.147) showed a total factor loading which accounted for 84%, 79% and 82% of the variance respectively at the urban, rural and national level. Importantly, it should be noted that questions 3, 4, 5, 6 and 7 of the questionnaire were answered in a pattern that made no clear distinction between the individual and the child, as opposed to question 8 which the interviewee responded to specifically for the child. Consequently the data were corrected separately for Qs 1 and 2, Qs 3 and 4, Qs 5, 6, 7 and 8 as well as Q 8 on its own (Table 8.148). These findings largely support the validity of the HSQ in terms of having measured the parameters intended with reasonable accuracy.

In summary, at the national level, one out of two HHs experienced hunger, one out of four were at risk of hunger and only one out of four HHs appeared food secure. In the rural areas a significantly higher percentage of HHs experienced hunger when compared with HHs in the urban areas. There was an overall consistent association between the hunger risk classification and anthropometric status. A similar association was found with energy intake and the intake of micronutrients. HHs at risk of hunger or experiencing hunger procured a smaller number of food items and had a similarly smaller number of food items in the HH inventory. Additionally, HHs at risk of hunger or experiencing hunger tended to be of the informal dwelling type, had the lowest monthly income and spent the lowest amount of money weekly on food. The mothers of such HHs also had a lower standard of education. The analysis of each question of the HSQ indicated that food insecurity was, on average, experienced nationally by two out of three HHs (66%), five out of ten individuals (56%) and four out ten children (45%) respectively at the HH, individual and at the child hunger level (Tables 8.23 – 8.46). In the majority of HHs, however, the temporal severity and periodicity were experienced to a lesser and diminishing extent than food insecurity and hunger *per se*. The distribution of affirmative responses according to the area of residence (rural/urban) revealed a significant trend ($P = 0.001$) towards greater food insecurity and hunger at the HH, individual, as well as at the child hunger

levels. At least 75% of the HHs in the rural areas nationally answered in the affirmative regarding HH food insecurity (53% in the urban areas) (Questions 1 and 2). At least 63% of the HHs in the rural areas indicated food insecurity at the individual level (44% in the urban areas) (Questions 3 and 4). At least 37% (range 37 - 62%) of HHs in the rural areas reacted positively to child hunger indicators [23% (range 23 – 43) in the urban areas], (Tables 8.23 - 8.46). However, the child hunger was less severe in both areas compared to the measured food insecurity at the HH as well as at the individual level. In both areas of residence the temporal severity and periodicity respectively measured lower (for all eight questions) than the food insecurity and hunger implicated in the questions *per se*. The temporal severity and periodicity respectively (for all eight questions) differed significantly between the rural and urban areas ($p= 0.001$). Provincially, in all nine Provinces the food insecurity at the individual level measured higher than that at the child hunger level. For the majority of Provinces (six out of the nine Provinces) the temporal severity was experienced to a lesser extent than the food insecurity and hunger indicated in each question *per se*. Likewise, the periodicity measured even lower than the temporal severity. Ranking of the Provinces on the basis of corrected factors for HH food insecurity (Table 8.148) showed that the Eastern Province could be regarded as the most food insecure Province, while the Free State and the Western Cape seemed to be the most food secure. The ranked profile was as follows:

- Eastern Province
- Northern Cape
- KwaZulu/Natal
- Northern Province
- North West Province
- Mpumalanga
- Gauteng
- Free State, and
- Western Cape

These results should, however, be interpreted with caution due to possible confounding factors such as, among others, cultural and language differences between the populations studied in the present survey.

DISCUSSION

Voluntary hunger (voluntary total fasting) has been repeatedly reported among individuals, including children⁵, or groups of individuals and is mostly seen as a means of specific protest. By definition (refusal to take food and or fluids for an extended time interval), voluntary hunger is relatively easy to quantify. Involuntary hunger, however, as arising from food insecurity is a much more complex entity, which is difficult to quantify. Nevertheless, the latter is being increasingly accepted as a core indicator of nutritional status, but it remains in need of much better definition and understanding in relation to nutritional issues⁶. It is, therefore, important to be extremely careful in the interpretation of the findings of the present survey.

The CCHIP questionnaire as used in this survey (HSQ) has been validated for defined populations in the USA¹. For the purposes of the present survey and in view of the crucial importance of validation in relation to the reliability of any findings, the HSQ was assessed retrospectively for internal consistency of the parameters included in each question by using the Cronbach's alpha⁷, and for criterion-related validity by using the dietary, food procurement, HH inventory data as well as selected parameters from the SDQ (type of dwelling, HH income, money spent on food and the education status of the mother), parameters which could be expected to vary by food insecurity status. With regard to the Cronbach's alpha, a value of 0.7 or greater is considered as acceptable for parameters in behavioural research⁷. The Cronbach's alpha obtained in this survey was 0.93, 0.91 and 0.93 respectively for HH and individual insecurity, and child hunger (Table 8.147). These values are better than those obtained in the USA¹ (respectively 0.84, 0.86, 0.85), and similar (0.92) to those reported in peri-urban area in Caracas, Venezuela⁸ using a different methodology. With regard to the criterion-related validity, all the selected anthropometric, dietary, including micronutrient intake, and SDQ parameters reflected a poorer nutritional status of children in food insecure HHs. Furthermore, the questionnaires were so designed as to allow for cross checking of the information provided by the interviewee on the same point of information at different stages of the interview. In this regard, there was a very

good agreement on the question of child hunger as obtained by the 24-H-RQ (not presented in this report) and HSQ. The validity data on the HSQ, therefore, are largely supportive of the overall findings of the present survey and can be considered to be a good reflection of child hunger and the HH food insecurity status.

The poorer dietary intake in children of food insecure HHs could be assumed to reflect a poor nutrient intake of all the members of such HHs, since the great majority (87%) of children ate from the family pot as reported in Chapter 6 of this report. It is, however, interesting to note that the frequency of affirmative responses for HH and individual food insecurity was higher than that of child hunger. This consistent trend found in the present survey may be related to findings in the literature⁹ indicating that women sacrifice the quality of their diets and limit the amount of food eaten by the adults in a HH in order to preserve the amount of food available to their children. In this regard, for adult women, food insufficiency has been associated with a low intake of energy, magnesium and vitamins A, E, C and vitamin B₆ in defined populations in the USA¹⁰, and energy, vitamin A, folate, iron and magnesium in Toronto, Canada¹¹. A poorer intake in food insecure HHs of a number of nutrients, albeit in children, has also been found in the present survey, which is in unison with findings in a similar population in the literature¹.

Perhaps of equal, if not greater, importance in the present survey, however, is the great extent of the inadequacies in nutrient intake, as reported in Chapters 5 and 6 of this report, which raise serious concern in terms of their known consequences in the growth and development of children in general¹². Dietary and growth considerations^{12,13} apart, recent evidence indicates that children from HHs that experience hunger are more likely to have emotional, behavioral and academic difficulties than children from HHs that have comparable incomes but do not experience hunger^{14,15}. Although the latter aspects did not form part of the aims of the present survey, the associations of a poorer anthropometric status and nutrient intake of children living in food insecure HHs is a finding that underscores the need to address food insecurity as a matter of urgency.

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