

ISSUES IN PUBLIC HEALTH

Food insecurity in households in informal settlements in urban South Africa

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Food insecurity in the urban poor is a major public health challenge. The Health, Environment and Development study assessed trends in food insecurity and food consumption over a period of 7 years in an informal settlement in Johannesburg, South Africa (SA). Annual cross-sectional surveys were conducted in the informal settlement (Hospital Hill). The degree of household food insecurity decreased significantly from 2006 (85%) to 2012 (70%). There was a spike in 2009 (91%), possibly owing to global food price increases. Childhood food insecurity followed the same trend as household food insecurity. During the first 3 study years, consumption of protein, vegetables and fruit decreased by 10 - 20%, but had returned to previous levels by 2012. In this study, although declining, food insecurity remains unacceptably high. Hunger relief and poverty alleviation need to be more aggressively implemented in order to improve the quality of life in poor urban communities in SA.

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Food security is a basic human right. However, during the period 2010 - 2012, 852 million people in developing countries remained food insecure.^[1,2] Of these 852 million people, 234 million lived in sub-Saharan Africa.^[1]

The First Millennium Development Goal endeavoured to reduce hunger by half from 1990 to 2015. Reports produced by the United Nations Food and Agriculture Organisation (FAO) indicate that progress towards this goal has been slow, and declined after 2009.^[1]

In South Africa (SA), three national surveys showed a decrease (from 52.3% to 25.9%) in food insecurity over the 10-year period 1999 - 2008.^[3] In urban areas, food insecurity decreased from 42% to 20.5%. In 2009, a study conducted in three impoverished communities in Johannesburg, SA, showed that 56% of all households surveyed were food insecure and 60% of households in an informal settlement were food insecure.^[4]

Food insecurity has been linked to detrimental health outcomes such as obesity, chronic diseases and mental health disorders in adults.^[5-9] In children, research has established a relationship between food insecurity and stunting, poor development and decreased academic ability.^[10-13] The literature contains numerous publications pointing to a variety of factors that increase the risk of being food insecure, such as poverty, lower levels of maternal education, unemployment, larger household size, and households that experience events that place an added demand on their budgets.^[14,15]

Cities, especially in developing countries, are highly heterogeneous, with communities ranging from extremely wealthy to impoverished. National surveys are limited and provide an overview, but often do not reflect the degree of food insecurity faced by very poor, marginalised communities such as those residing in informal settlements.

Case study

The Health, Environment and Development study was conducted in an informal settlement (Hospital Hill) in Johannesburg to assess

trends in food security from 2006 to 2012. The main predictors of food insecurity in this community and associated health outcomes were determined. Hospital Hill is located on the south-western outskirts of Johannesburg. A convenience sample of 188 dwellings was initially drawn for inclusion in the study. The response rate ranged from 55% in 2006 to 73% in 2012.

At the selected dwellings, after written, informed consent had been obtained, a prestructured questionnaire was administered to a household member at least 18 years of age to obtain information on sociodemographic status, perceptions of housing and neighbourhood conditions, food security and health status. The Radimer/Cornell Questionnaire Rating Scale^[16] was modified to assess food security in households (Table 1). This scale normally assesses food security in individuals. Modified versions of this tool have been validated in developing countries such as Indonesia.^[17] For the purpose of analysis the households were grouped into three categories:

- Food secure: if the interviewee answered 'never' to all questions
- Household food insecure: if they answered 'sometimes', 'often' or 'always' to one or more questions related to household food security (questions 1 - 7)
- Child food insecure: if they answered 'sometimes', 'often' or 'always' to one or more questions related to childhood food security (questions 8 - 10).

The categories 'sometimes', 'often' and 'always' were combined and a binary variable produced.

Food security and related socioeconomic factors

The results of this study showed a high degree of household food insecurity in the Hospital Hill community. In 2006, 85% of households were food insecure. This increased and peaked at 91% in 2009. Between 2009 and 2012, the number of food-insecure

Table 1. Modified Radimer/Cornell Questionnaire

Question	Never	Sometimes	Often	Always
1. We worry whether our food will run out before we get money to buy more				
2. The food that we bought just didn't last and we didn't have money to get more				
3. We ran out of the foods that we needed to put together a meal and we didn't have money to get more food				
4. We eat the same thing for several days in a row because we only have a few different kinds of food on hand and don't have money to buy more				
5. We can't afford to eat properly (we cannot eat in the way we would like to)				
6. We are often hungry, but we don't eat because we can't afford enough food				
7. We eat less than we think we should because we don't have enough money for food				
8. We cannot give our child(ren) a balanced meal because we can't afford that				
9. Our child(ren) is/are not eating enough because we just can't afford enough food				
10. We know our child(ren) is/are hungry sometimes, but we just can't afford more food				

Table 2. Food consumed by household at least three times per week, and expenditure on food

	2006 (N=104)	2009 (N=74)	Change over 3 years 2006 - 2009	2012 (N=138)	Change over 3 years 2009 - 2012
Food item, n (%)					
Dairy products	55 (52.9)	43 (58.1)	↑	80 (58.0)	↔
Carbohydrates	102 (98.1)	70 (94.6)	↓	131 (94.9)	↔
Proteins	89 (85.6)	49 (66.2)	↓	119 (86.2)	↑
Vegetables	97 (93.3)	60 (81.1)	↓	121 (87.7)	↑
Fruit	92 (88.5)	50 (67.6)	↓	110 (79.7)	↑
Sweets	36 (34.6)	36 (48.6)	↑	69 (50.0)	↑
Fast foods	28 (26.9)	35 (47.3)	↑	62 (44.9)	↓
Food expenditure (ZAR), mean/month	378.10	633.64	↑	753.61	↑

households decreased by 21%. These results are indicative of the effects of the 2007 - 2009 food price increases experienced globally, and confirm the vulnerability of the very poor.^[1] In households with children, 67% were food insecure. Households with children were therefore more likely to be food insecure, but the association was not statistically significant ($p=0.1$). However, there was a significant risk of child food insecurity if the whole household was food insecure ($p<0.01$) (Fig. 1).

The degree of food security has been shown, in this study and in the literature, to vary within and between households in the same community over time, owing to economic and other stressors such as illness or unexpected expenses.^[1,18] Compared with national levels of food insecurity (estimated at 48%),^[3] residents of this urban informal settlement face a much higher level of food insecurity (70%). The same is likely to apply to other urban informal settlement communities in SA.

Factors such as very low income (<ZAR1 000 per month; 1.00 ZAR = 0.09 USD at the time of writing) ($p=0.01$; crude odds ratio (OR) 3.46; 95% confidence interval (CI) 2.13 - 5.62), low asset ownership ($p<0.01$; crude OR 4.11; 95% CI 2.31 - 7.32), having a higher number of major problems with the dwelling ($p<0.01$; crude OR 3.48; 95% CI 2.19 - 5.54) and lack of full-time employment of the head of the household ($p=0.01$; crude OR 2.81; 95% CI 1.21 - 6.53) were significantly associated with an increased risk of having a food-insecure household. This study confirms the well-documented

finding that indicators of poor socioeconomic status are predictive of food insecurity.^[3,19,20] Monthly food expenditure was significantly lower in food-insecure relative to food-secure households ($p=0.04$), indicating the degree of poverty faced by food-insecure households. According to Bonti-Ankomah,^[21] an average household of four members in 2001 needed at least R1 146 per month to obtain a healthy diet for all members. Owing to inflation, higher monthly food expenditure would be expected in 2012. In this Hospital Hill community, households spent on average only R753.61 on food, an increase of R119.97 from 2009 to 2012.

Household food consumption from 2006 to 2012

From 2006 to 2009, there was a 10 - 20% decrease in the consumption of vegetables, protein foods and fruit. However this increased steadily from 2009 to 2012 to approximately the same levels as in 2006, indicating that in periods of food stress or economic downturn, consumption of vegetables, fruit and protein decreased (Table 2). Another finding of this study is the increased trend in the consumption of fast foods, which climbed by 18% between 2006 and 2009, and was sustained at the higher level of consumption in subsequent years. Undernutrition or malnutrition, i.e. a lack of adequate micronutrients, is a major consequence of chronic food insecurity.^[18,20] Coping strategies during periods of food insecurity such as decreasing the variety of foods eaten, limiting portion sizes

and eating cheaper fast foods will affect nutritional status negatively.^[19,22]

The 2012 FAO report showed that worldwide, more than 2.5 million children die each year from malnutrition as a consequence of food insecurity.^[1] Sub-Saharan Africa has the highest rates of child underweight and infant and child mortality in the world.^[1] Underweight and stunting are common among undernourished children, although at a global level the percentage of stunting and underweight in children has decreased.^[1] In SA, this decrease may be attributed to interventions such as the Child Support Grant or school food programmes.^[1,3] However, such national or provincial programmes may not be enough to mitigate the effects of high levels of food insecurity (70% in 2012) in very poor urban households.^[18] The study by Oldewage-Theron *et al.*^[19] in an SA informal settlement showed that 31% of boys and 30% of girls were stunted. The review by Labadarios *et al.*^[3] on the national surveys in SA indicated that the diet consumed by poor SA children was inadequate and did not meet nutritional requirements. These national surveys also confirmed the limited variety of foods consumed.^[3] Therefore, although hunger and food insecurity may not be widespread in SA in general, there are communities that are particularly vulnerable.^[19]

Food insecurity and health outcomes

Levels of chronic disease in this community were relatively low, with only 24% being affected with any type of chronic disease (diabetes mellitus, hypertension or heart disease). Twenty per cent of households with a member who had a chronic disease were food insecure. Thirteen per cent of respondents in food-insecure households screened positive for common mental health disorders (anxiety or depression) using the World Health Organization self-reporting questionnaire,^[23] compared with 1% in food-secure households; however, this difference was not significant ($p=0.34$). While we did not find a significant association with health outcomes, chronic illness has been shown to be a predictor and a consequence of food insecurity, and in some cases the hungry are forced to choose between food and medicine.^[24] Sorsdahl *et al.*^[5] showed in a national survey that after controlling for socioeconomic data, food insecurity was significantly related to having a 12-month and lifetime *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV)-confirmed diagnosis of an anxiety disorder. A possible

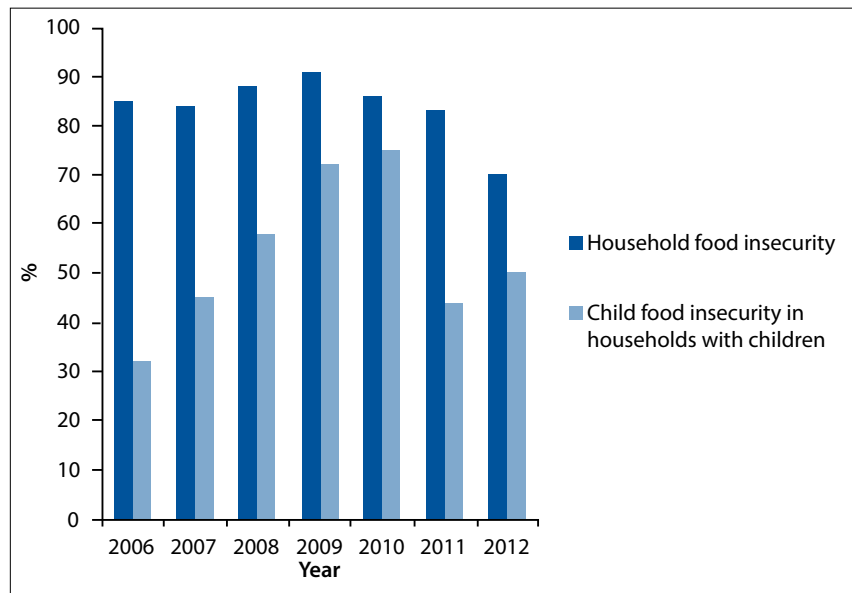


Fig. 1. Trends in household and child food insecurity from 2006 to 2012.

reason for the low levels of chronic ill health or common mental disorders may be the sociodemographic profile of the Hospital Hill community.

Conclusion

This study highlights the plight of South Africans living in urban informal settlements where poverty levels dictate the degree of food insecurity. As an immediate solution, social grants may help to alleviate deprivation by increasing household income, but medium- and long-term strategies such as increased employment opportunities, education and the empowerment of women are required.

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