

Urbanization, nutrition and development in Southern African cities

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Received: 14 May 2013 / Accepted: 17 December 2013 / Published online: 17 January 2014
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Abstract This paper draws on existing studies and survey data collected from 11 cities in nine Southern African countries by the African Food Security Urban Network in order to explore the relationship between urban poverty and food and nutrition insecurity in Southern Africa. The paper demonstrates that poverty underpins the high levels of food insecurity and malnutrition evident amongst the urban poor in Southern Africa; therefore, *access* to food, and not *availability*, is at the heart of the urbanisation-nutrition-development nexus. The paper reviews the state of knowledge about food insecurity and the double burden of nutritional diseases in the urban areas of Southern Africa and lays out an agenda for future research to fill significant knowledge gaps.

Keywords Nutrition · Food security · Urbanisation · Poverty · Cities · Southern Africa

Introduction

Sub-Saharan Africa faces two fundamental development challenges in the 21st Century. The first is poverty, and the second is rapid urbanization. Both of these conditions combine to perpetuate—and in some cases deepen—food and nutrition

insecurity in urban areas. In Sub-Saharan Africa, poverty levels are the highest in the world. The World Bank estimates that approximately half of the sub-continent's population live below the income poverty line of USD1.25 per day (World Bank Open Data 2012). The consequences of these persistent and high levels of poverty include poor performances on all of the Millennium Development Goal (MDG) targets. For example, under Goal 1, Target (a) is to halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day. In 1990, 56 % of the population lived on less than USD1.25 per day; this improved by 2008, but only by 9 % (UNESA 2011). Target (c) is to halve, between 1990 and 2015, the proportion of people who suffer from hunger; for Sub-Saharan Africa, this proportion was reduced by only 5 %, and food insecurity remains a major development challenge (UNESA 2011).

The 2012 African Human Development Report published by the United Nations Development Program (UNDP) demonstrates clearly that Africa is the most food insecure continent. The report explains that “across sub-Saharan Africa, hunger prevalence is the highest in the world. More than one in four Africans—close to 218 million people in 2006–2008—are undernourished, and food security is precarious” (UNDP 2012). A further outcome of this poverty-food insecurity dynamic is widespread malnutrition. In Sub-Saharan Africa, about 27 % of children under age five are underweight, and 30 % of the total population is malnourished (UNESA 2011; WFP and FAO 2010).

These high levels of poverty and associated food and nutrition insecurity have been largely a rural phenomenon in Africa; however, this is now changing in the context of rapid urbanization. It is projected that the global urban population will grow by 1.7 % per annum for the next two decades (World Health Organisation WHO/UN Habitat 2010; UNESA 2011). In contrast, at about 3.5 % per annum, the urban population growth rate of Sub-Saharan Africa will be

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double that of the world average until 2030 (UNESA 2011). Urban growth rates for Eastern Africa are projected to exceed 4 % per annum for the same period (UNESA 2011). In Southern Africa, the expected urban growth rates are much closer to the global average, which reflects the fact that the region is already highly urbanized. Almost 60 % of Southern Africa's population lives in cities; with a negative annual rural growth expected for the next half century, the towns and cities of that region will continue to absorb all natural population growth as rural populations experience an absolute decline (Table 1) (UNESA 2011).

In their 2010 joint report *Hidden cities: unmasking and overcoming health inequities in urban settings*, the World Health Organization (WHO) and UN-HABITAT argue that this urban transition brings with it rising social and economic disparities within cities. While urbanisation has generally been associated with increases in welfare at the city scale, the disaggregation of data *within* cities shows a bifurcation of welfare outcomes on the basis of income and living conditions. As a result, "the different worlds of city dwellers remain in the shadows, and the substantial health challenges of the disadvantaged go overlooked." (WHO-UNHABITAT 2010). These intra-urban disparities are evident in all major cities, and are pronounced in sub-Saharan Africa, where growing urban populations are becoming poorer (Ravallion 2007). This 'urbanisation of poverty' is taking place within a generalised transformation of a historically agrarian population to an urban one, and studies show that it is the urban poor who suffer disproportionately from a range of development challenges (Amis 1995; Mehta 2000; Tibaijuka 2009). In particular, we argue in this paper that these two factors—poverty and urbanization—combine to create a series of negative outcomes, including high levels of food and nutrition insecurity, which are now concentrating in urban areas (WHO-UNHABITAT 2010). As a result, malnutrition is in turn a major contributor to both mortality and morbidity and is consequently also a vexing development problem, the locus of which is increasingly urban (WFP and FAO 2010; United Nations Development Program (UNDP) 2012).

This paper draws on existing studies and survey data collected from 11 cities in nine Southern African countries

by the African Food Security Urban Network (AFSUN) in order to explore the relationship between urban poverty and food and nutrition insecurity in Southern Africa. The paper demonstrates that poverty underpins the high levels of food insecurity and malnutrition evident amongst the urban poor in Southern Africa; therefore, *access* to food, and not *availability*, is at the heart of the urbanisation-nutrition-development nexus. After describing the survey methodology, the paper reviews the state of knowledge about food insecurity and the double burden of nutritional diseases in the urban areas of Southern Africa and lays out an agenda for future research to fill significant knowledge gaps.

Methodology

The AFSUN Urban Food Security Baseline Survey was conducted in late 2008 and early 2009 in eleven cities in nine countries in Southern Africa: Blantyre, Cape Town, Gaborone, Harare, Johannesburg, Lusaka, Maputo, Manzini, Maseru, Msunduzi (Pietermaritzburg) and Windhoek. The surveyed cities represent a mix of primary and secondary cities; large and small cities; cities in crisis, in transition and those on a strong developmental path; and a range of local governance structures and capacities as well as natural environments. One or more poorer urban neighbourhoods were identified for study in each city. In the larger cities, such as Cape Town and Johannesburg, different types of formal and informal urban neighbourhoods were chosen. Within city neighbourhoods, households were sampled using a systematic random sampling technique; when it was not possible to interview people in the designated household a substitution was made. The resulting AFSUN Urban Food Security Regional Database contains information on 6,453 households and 28,771 individuals. A data analysis workshop was hosted by the University of Witwatersrand in Johannesburg in February 2008.

AFSUN selected the food security assessment methodology developed by the Food and Nutrition Technical Assistance (FANTA) project (Swindale and Bilinsky 2006; 2007). FANTA's food insecurity scales and indicators are designed to measure food access and dietary diversity and have already been successfully used in rural Southern Africa (Faber et al. 2009). Of the four measures used in the AFSUN survey, two are reported in this paper. (1) Household Food Insecurity Access Prevalence Indicator (HFIAP): the HFIAP indicator categorizes households into four levels of household food insecurity (access): food secure, and mild, moderately and severely food insecure (Coates et al. 2007, 21–22). Households are categorized as increasingly food insecure as they respond affirmatively to more severe conditions and/or experience those conditions more frequently. (2) Household Dietary Diversity Scale (HDDS): dietary diversity refers to

Table 1 Annual urban and rural growth rate for Southern Africa (%): 2010–2030

Year	Urban annual growth rate	Rural annual growth rate
2010–2015	1.34	−0.45
2015–2020	1.21	−0.56
2020–2025	1.15	−0.60
2025–2030	1.02	−0.72

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 2011 Revision*

how many food groups are consumed within the household over a given period (Swindale and Bilinsky 2006). The maximum number is 12. An increase in the average number of different food groups consumed provides a quantifiable measure of improved household food access. In general, any increase in household dietary diversity reflects an improvement in the household's diet (see Frayne et al. 2010 for further details on methodology and individual city reports are available for free download at www.afsun.org).

Results and discussion

Food and nutrition insecurity

As argued in the introduction to this paper, urban food insecurity and undernutrition are growing under conditions of rapid urbanization, and the rural–urban gap is also narrowing (Fotso 2006; Fotso 2007; Anyamele 2009). In urban areas, however, food *availability* is seldom the key factor contributing to undernutrition (Smith and Haddad 2001). Rather, food *inaccessibility*, especially for children, combined with inadequate access to health services, poor sanitation and care are the leading causes of undernutrition (Ruel 2008). The urban poor are exposed to both acute and chronic problems of food *access*—often on an ongoing basis—thus impacting nutritional status negatively at all stages of the life cycle, from conception to adulthood, and also in old age.

The widespread problems of food access in the urban areas of the Southern Africa are demonstrated by the AFSUN survey data (Frayne et al. 2010). In some cities, over 60 % of households in sampled poor communities were severely food insecure (Table 2). Only in two cities (Blantyre and Johannesburg) were less than 30 % of the households in the selected communities severely food insecure. However, when severely and moderately food insecure households were combined, the figures for these two cities rise to 51 % and 42 % respectively. In Harare, 96 % of the poor households were severely or moderately food insecure, followed by Lusaka (at 93 %), Manzini (92 %), Maseru (90 %), Msunduzi (87 %), Maputo (86 %), Gaborone (82 %) and Cape Town (80 %).

Within the context of widespread and chronic food insecurity that the AFSUN data reveal, it is hardly surprising that little progress has been made in Southern Africa towards meeting the Millennium Development Goal (MDG) target of reducing hunger by half by 2015 (UNICEF 2006). Very little improvement has been documented in such common indicators of undernutrition as low birth weight and stunting of children, both of which are related to foetal health and maternal nutritional status (UNSCN 2010). The absolute number of underweight children has actually *increased* in the region over the past 15 years. In every single country, more than a quarter of children under 5 are moderately or severely stunted. In some countries (DRC, Lesotho, Malawi, Madagascar, Mozambique, Tanzania and Zambia) over 40 % are stunted. In South Africa, almost one quarter of children under five are stunted and the stunting rate has decreased only slightly, from 35.4 to 33.3 % since 1990. By contrast, rates in South-East Asia have declined substantially, from 47 to 29.4 % (UNSCN 2010).

Child underweight prevalence is positively correlated with household income. In the six countries for which there are data, a significant minority of underweight children are from households in the lowest income brackets (ranging from 28 % in Zimbabwe to 56 % in the DRC). Rates of child malnutrition are also generally higher in rural than urban areas (Smith et al. 2005). However, UNICEF reports that the urban-rural gap may be closing (UN 2008). As malnutrition rates are generally reported at the city rather than the neighbourhood level, it is likely that levels are disproportionately higher in low income and slum areas and may even exceed levels in rural areas (WHO-UNHABITAT 2010; von Braun et al. 2003). This trend is probably the consequence of rising urban poverty associated with urbanization, which is supported by the macro-level data that illustrate a direct relationship between income and food and nutrition security, with low income communities in urban areas experiencing the greatest levels of malnutrition. Figure 1 demonstrates this trend, with approximately 15 % of children amongst the richest 20 % being chronically malnourished, compared with 35 % amongst the poorest 20 % of households.

In South Africa, while there has been a modest reduction in the prevalence of stunting and severe stunting between 1999

Table 2 Household Food Insecurity Prevalence in Poor Communities (% of households)

Household Food Security Status	Windhoek	Gaborone	Maseru	Maputo	Manzini	Blantyre	Lusaka	Harare	Cape Town	Msunduzi	Johannesburg	Total
Food secure	18	12	5	5	6	34	4	2	15	7	44	17
Mildly food insecure	5	6	6	9	3	14	3	3	5	6	14	7
Moderately food insecure	14	19	25	32	13	30	24	24	12	27	15	19
Severely food insecure	63	63	65	54	79	21	69	72	68	60	27	57

N=6,453

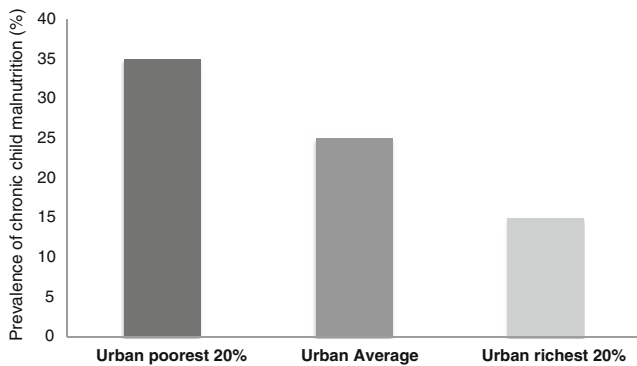


Fig. 1 Chronic malnutrition among children less than 5 years of age for low-and middle-income countries in Africa (2010)

and 2005, notably in rural areas, the prevalence of wasting and severe wasting has *increased* in urban areas (Kruger et al. 2005). Although further research is required to better understand this trend, it is likely that the persistence of urban poverty and the ongoing urbanization process are responsible for deteriorating conditions in South African cities. Similar trends are likely to occur in other SADC towns and cities.

Nutrition security is an important aspect of health, and this is largely achieved through a sufficiently diverse diet. The AFSUN baseline survey collected data on household dietary diversity, and found that dietary diversity was inadequate for many poor households (Table 3) (Kruger et al. 2005). The average Household Dietary Diversity Score (HDDS) for all households in the survey was six, with the dominant food type eaten by the majority being starch staples (96 %); but when the non-nutritive food items of sugar and beverages were removed from the dietary intake of the sample, the dietary diversity score dropped to four, which is considered inadequate to achieve good health (Frayne, et al. 2010; Labadarios 2007; Ardington and Gasealahwe 2012). Over

Table 3 Dietary Diversity Scores (% of households)

Number of Food Groups	% of Households	Cumulative %
1	2	2
2	11	13
3	10	23
4	11	34
5	14	48
6	13	61
7	12	73
8	10	83
9	7	90
10	4	94
11	3	97
12	3	100
Total	100	

N=6,453

60 % of the households scored six or less, and nearly a quarter scored three or less. The median HDDS for food secure households was 8 and for food insecure households it was 5; the difference between secure and insecure households is statistically significant ($p<0.001$, $\eta^2=0.399$). This suggests that there is a strong relationship between food security and dietary diversity. In other words, as food insecurity increases, dietary diversity declines. It is therefore no surprise that malnutrition and underweight affect such a large proportion of poor people in Southern African cities.

Income is an important asset in an urban environment, providing the means of access to food for most individuals and households. The AFSUN data demonstrate that household income and the food insecurity status of the household positively correlated. Income terciles were computed against food security status, and the data show that those households with the *lowest* incomes experience the *highest* levels of food insecurity (Fig. 2). Food security increases with a rise in household income across all types of households, and this relationship is statistically significant ($p<0.001$, $cc=0.250$) at the regional level. Interestingly, of the 11 cities surveyed, Blantyre had the strongest correlation between income and food security status ($p<0.001$, $cc=0.406$); and Harare the weakest ($p<0.023$, $cc=0.132$). In the case of Harare, this reflects the collapse of the Zimbabwean economy and the generally poor levels of real income at the time of the survey (last quarter of 2008). Even in cases where households had hard currency (for example, Rands or US Dollars) at the time of the survey, there was an absolute lack of available food to purchase.

A new epidemic? over nutrition in Southern Africa

Rapidly-urbanizing developing countries are undergoing a major 'nutrition transition' (Popkin 2004). Popkin's (2004) influential model suggests that the transition typically follows a number of distinct stages (Fig. 3). Rapidly-urbanizing developing countries are generally moving from Stage 3 towards Stage 4 of the transition, with the co-existence of malnutrition

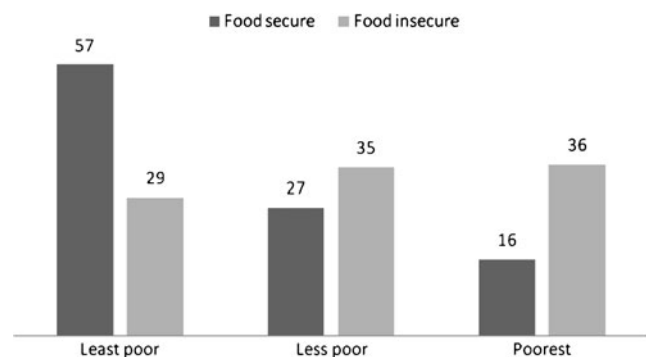


Fig. 2 Household Income Terciles by Food Security Status (%), 2008

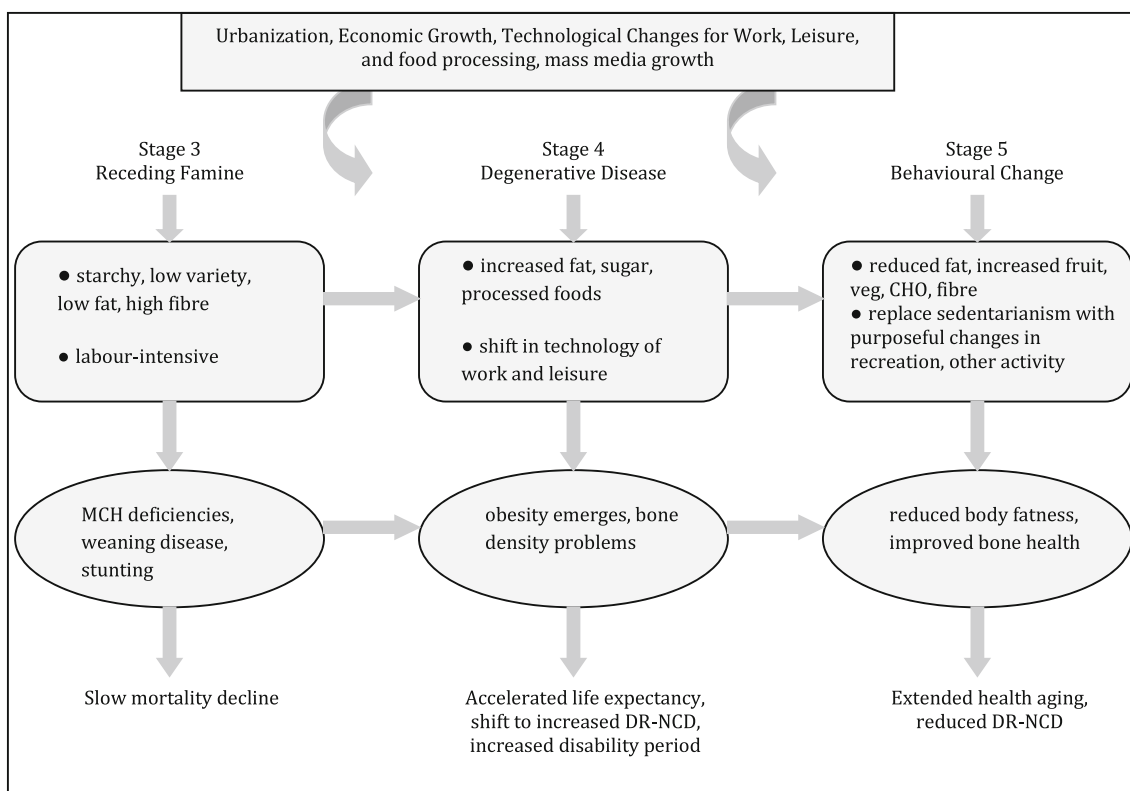


Fig. 3 Later stages of the nutrition transition

and obesity, which disproportionately affects the poor. Given the speed of urbanization and the considerable population growth expected in the cities of the developing world over the coming decades – some 2–3 billion by mid-century—the double burden of disease threatens to overwhelm the capacity of the health care system and other social services in many countries (Evans 2009). Food and nutrition security is centre-stage in this transition, with access to good, healthy food being critical to the ability of the urban poor to move towards Stage 5 and a more productive and longer life (Popkin and Gordon-Larsen 2004).

Despite the overwhelming evidence for undernutrition in Africa, there are growing indications that overnutrition is affecting the continent as well. A recent review of 28 studies in West Africa, for example, found an overall obesity prevalence of 10 % and higher rates among adult women and in urban areas (Akubakari et al. 2008). The prevalence of obesity in urban West Africa had more than doubled in the previous 15 years. Another review of seven countries in West and East Africa found that the prevalence of urban overweight/obesity increased by nearly 35 % between 1992 and 2005 (Ziraba et al. 2009; Villamor et al. 2006). The increase was higher among poorer (50 % rise) than wealthier (7 % rise) socio-economic groups. There was also an increase of 45–50 % among non-educated and primary school-educated women, compared to a drop of 10 % among women with secondary education or higher. Evidence of an urban nutrition transition

has also been reported in many individual African countries (Siervo et al. 2006; Sodjinou et al. 2008; Villamor et al. 2006). Overnutrition and undernutrition are often both present in the same community and even within the same household, leading researchers to propose the notion of “dual burden” households (Garrett and Ruel 2003; Deleuze et al. 2005; Doak et al. 2005).

In Southern Africa, most of the research on overnutrition has been conducted in South Africa. The evidence suggests that South Africa is tracking rapidly from Stage 3 to Stage 4 of the nutrition transition, and there is every reason to suppose that the other countries will follow suit. The double burden is clearly present in South Africa’s adult population, although there is considerable variation by age, race, sex and location (urban versus rural).

The 2008 National Income Dynamics Survey (NIDS) and earlier South African Health and Demographic Surveys (SAHDS) provide an opportunity to track changes in undernutrition and overnutrition over the last decade (Department of Health 2001; Puoane et al. 2002; Department of Health and Medical Research Council 2003; van der Merwe and Pepper 2006). The 1998 SAHDS and 2008 NIDS data for undernutrition and overnutrition provide evidence of several shifts and trends over the last decade (Tables 4 and 5). First, amongst both men and women there has been a small fall of around 1 % in the proportion of adults who are underweight (from 13 to 12 % in the case of men and from 6 to 5 % in the case of

Table 4 Nutrition profile of South African male population, 1998–2008

Age	Underweight SAHDS 1998 (%)	Obese SAHDS 1998 (%)	Underweight NIDS 2008 (%)	Obese NIDS 2008 (%)
15–25	21.6	2.4	19.5	3.9
25–34	8.6	7.5	6.6	9.0
35–44	8.6	12.9	8.7	13.3
45–54	9.3	17.1	11.2	20.8
55–64	9.1	14.7	7.2	21.8
>65	10.0	13.5	10.3	18.9
Location				
Rural	16.5	6.0	15.6	7.2
Urban	11.0	11.0	9.8	13.3
Income				
Q1*	NA	NA	17.8	5.9
Q2	NA	NA	17.3	5.3
Q3	NA	NA	16.8	7.3
Q4	NA	NA	11.2	9.5
Q5	NA	NA	4.9	19.1
Total	13.1	9.2	12.1	10.9

*Quintile

women). In both groups, the fall was greatest amongst people under the age of 35. The fall occurred in both urban and rural areas. Second, there was an increase in obesity (from 9 to 11 % of men and from 27 to 36 % of women). In every age group,

Table 5 Nutrition profile of South African female population, 1998–2008

Age	Underweight SAHDS 1998 (%)	Obese SAHDS 1998 (%)	Underweight NIDS 2008 (%)	Obese NIDS 2008 (%)
15–25	9.7	8.9	7.5	13.3
25–34	5.4	26.3	4.0	28.7
35–44	2.7	38.9	2.8	45.0
45–54	4.0	44.9	2.8	50.9
55–64	2.7	45.2	3.1	46.2
>65	7.7	32.3	3.8	45.8
Location				
Rural	6.7	26.9	5.3	29.4
Urban	5.1	26.4	4.0	36.0
Income				
Q1	NA	NA	5.8	26.3
Q2	NA	NA	5.5	24.9
Q3	NA	NA	4.3	24.0
Q4	NA	NA	4.9	26.4
Q5	NA	NA	2.1	30.0
Total	5.7	26.6	4.6	36.0

male and female, obesity increased by 1–12 %. Obesity also increased in every racial group and in both rural and urban areas. The increase was greater in urban than rural areas, however (from 11 to 13 % of urban men and from 26 to 36 % of urban women; compared to rural increases of 1 % amongst men and 2 % amongst women).

Urban case study evidence confirms these general findings. A study of elderly (over 60) residents of Sharpeville, for example, found that 84 % of the women were obese despite evidence of chronic food insecurity (Oldewage-Theron et al. 2008). The study concluded that “poverty, malnutrition, both undernutrition and overnutrition, as well as household food insecurity and poor health were the major problems observed in this elderly community.” Another study in Khayelitsha, Cape Town, found that the prevalence of overweight/obesity was 53 % among women and 19 % among men, despite the fact that women were physically more active than men (Malhotra et al. 2008). A separate Cape Town study found that women who were nutritionally deprived as children were significantly more likely to be obese as adults, while men who were deprived as children faced no greater risk. Women of higher adult socioeconomic status were also significantly more likely to be obese, which was not true for men (Case and Menendez 2009). Amongst high-school children, there is strong evidence of both under-nutrition and over-nutrition (Reddy et al. 2009).

A direct link has been suggested between the nutritional status of adults and children in the same household. A study using data from the 2005 South African National Consumption Study showed that obese and overweight mothers have significantly more overweight children than non-obese mothers and were significantly less likely to have stunted or underweight children (Steyn et al. 2011). Underweight women and stunted women were significantly more likely to have underweight and stunted children, respectively. The NIDS shows that obesity and undernutrition can co-exist within the same household. In 45 % of households with a stunted child, for example, there is at least one obese adult and in 37 % of households where there is an underweight child there is at least one obese adult. In more than one in eight South African households there is both an over-nourished adult and an under-nourished child (Ardington and Gasealahwe 2012).

As demonstrated by the AFSUN data in the earlier discussion on the relationship between household income and food security, income is a critical determinant of food accessibility in urban contexts (Fig. 2). As a general statement, we might therefore expect that a rise in income would result in greater access to food and better nutrition profiles amongst the urban poor. Increases in income do, in general, result in greater spending on food, especially by increasing variety and including higher value foods such as fruit, vegetables and animal products, and therefore improving food and nutrition security

outcomes (Frayne et al. 2010). Wealthier households also spend more per calorie than poorer households. However, whether or not increased spending on food improves nutritional status amongst poorer urban households is a question that has not been adequately addressed and which needs further research (Bourne 1996; Bourne et al. 2002). While higher value foods may be preferred, the levels of food processing and convenience foods that prevail in urban food markets mean that greater diversity may not result in improvements in nutritional quality (and may even result in a deterioration of nutritional status) (Popkin and Gordon-Larsen 2004; Pingali 2004; Solomon 2009).

Obesity is the result of the over-consumption of calories and a decrease in physical activity. However, the picture is more complex than simply over-eating. In some urban food markets, the industrial food processing and supply system has replaced traditionally nutritious foods (still available in many rural areas) with nutritionally inferior, energy-dense, but cheaper foods and drink (Wojcicki 2005). In addition to being nutritionally poor, these cheaper foods typically comprise highly refined, low fibre cereals, fats (and especially trans fatty acids) and sugar (Goedecke et al. 2006). The so-called ‘Western diet’ is associated with many non-infectious health conditions and diseases that are already reaching epidemic proportions in high-income countries. They are now also emerging in developing countries and the burden of non-infectious disease is increasingly being carried by the urban poor in these societies (WHO-UNHABITAT 2010).

Studies have shown that lower calorie, nutrient-dense, less-processed foods such as fruits and vegetables generally do

cost more, and that cost is a barrier to the urban poor (Faber et al. 2009; Schönfeldt et al. 2010; Brinkman et al. 2010; Temple and Steyn 2011). Less healthy versions of particular foodstuffs also tend to cost less. A recent study of food prices in 14 small towns in the Western Cape in South Africa, for example, compared the prices of six commonly consumed foods with healthier versions of those foods (e.g., whole-wheat bread versus white bread) (Temple et al. 2011). Healthier foods cost between 10 % and 60 % more when compared on a weight basis and between 30 % and 110 % more when compared based on the cost of food energy. For a household of five occupants, the increased expenditure on food by eating a healthier diet would be over R12,000 per annum, a high proportion (>30 %) of the total household income for most of the population.

Other factors influencing health in urban settings include sedentary lifestyles, environmental pollution, stress and crowding, and the associated mental health challenges associated with urban poverty. Research on rural–urban migrants in other contexts clearly demonstrates that health is inversely correlated with length of time in an urban area. A recent study of rural–urban migrants in China found that increases in mobility were associated with suboptimal health status, inferior health-seeking behaviour, elevated levels of substance use, depressive symptoms and expression of dissatisfaction with life (Li et al. 2006). In South Africa, studies have observed that rural–urban migrants become increasingly unhealthy with time in the city, and that these changes are attributable to four common lifestyle changes: a decrease in physical activity, a change in diet and eating patterns, adoption

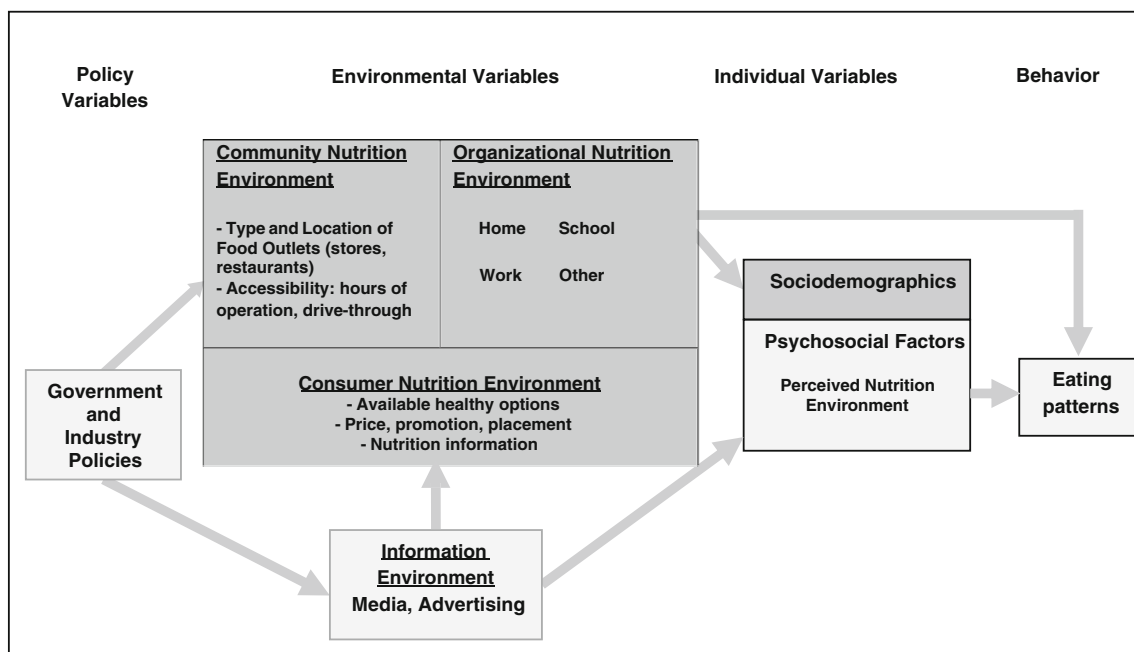


Fig. 4 Model of nutrition environments

of tobacco use and increased alcohol use (Steyn 2006). The Transition and Health during Urbanisation of South Africa (THUSA) study found that physical inactivity is a major determinant of obesity in adult black women in the study area (North West Province) (Kruger et al. 2002). Subjects in the highest tercile of physical activity were less likely to be obese, and inactivity was the strongest predictor of obesity, when compared to other demographic and self-reported dietary factors. In addition, “associated cardiovascular risk factors were significantly attenuated in those women who were physically active, even at the same level of obesity (Goedecke et al. 2006).”

Conclusion

Food insecurity in Africa has risen to the top of the international development agenda over the course of the last decade. Most of the policy and research emphasis, however, is on the chronic problem of undernutrition and associated negative health outcomes in the rural areas of the continent (Crush and Frayne 2010). Important as it is to find ways to overcome rural poverty and malnutrition, Africa faces an increasingly urban future and urbanization per se is not the panacea for food insecurity. Indeed, undernutrition itself is taking on an increasingly urban character in Africa. There is therefore an urgent need to document the levels and determinants of nutritional status in the region’s rapidly-expanding urban areas. As Monteiro et al. (2004) have argued in relation to Brazil, “recognizing that the links from food availability to access to consumption to nutritional status are *not* automatic, the challenge for policy makers and analysts concerned with achieving food and nutrition security is to understand how these variables are linked to one another, how closely they are related in various contexts, and what the important intervening variables are which affect the linkages among these variables” (Monteiro et al. 2004). Understanding these variables and linkages is particularly challenging in Southern Africa, given the range of issues affecting nutritional outcomes. Although there is a growing recognition that the food security and nutritional status of poor people in urban areas are matters of concern in Southern Africa, relatively little information is available to guide sound policy making.

Food policy is generally seen as something to be formulated and implemented not researched. However, given the scope and complexity of the problems of urban nutrition, it is important to research and evaluate the successes and failures of past programmes (Ecker and Qaim 2011). This applies both to the nutrition policies of national and local governments and the programmes of international organizations such as the FAO, UNICEF and WHO. When apparently forward-looking policies such as the South African Integrated Food Security Strategy are not implemented, it is important to

know why (Chopra et al. 2009; Drimie and Garrett 2009; McLachlan and Koch 2011). Even the best-intentioned and well-designed government policies have the potential to fail under conditions of inadequate resourcing, lack of political ownership and intra-departmental competition.

In this paper, we have attempted to put the nutritional dimensions of urban food insecurity more firmly on the urban food security research and policy agenda. In the urban context, *food accessibility* and *dietary quality* are the critical determinants of household and individual nutritional status. AFSUN’s 2008-9 baseline food security survey in eleven different cities showed that three quarters of households were food insecure, and that in general, dietary diversity scores are low (Frayne et al. 2010). In other words, undernutrition in the urban context may be as much about what people can afford to eat as how much they can eat. It is noteworthy that the same survey did not find a strong linkage between urban agriculture and either dietary diversity or household food security scores amongst the urban poor sampled. As reported by Crush, et al. (2011a, 289), urban agriculture ‘plays a relatively minor role in the food supply of most households and very few derive any kind of income from the sale of home-produced food’.

Research in the rural context focuses primarily on the causes and consequences of undernutrition (often incorrectly assumed to be the result of an absolute shortage of food rather than a dearth of resources to access that food). As we have argued here, undernutrition is also a significant and growing problem in Africa’s rapidly growing towns and cities. However, urbanization is bringing with it a nutrition transition and the growth of another significant nutritional problem: overnutrition or obesity. The evidence reviewed in this paper suggests that levels of obesity are escalating rapidly in the continent’s towns and cities and not just amongst the more affluent and better-off. Poor urban communities and households of Southern Africa are being increasingly affected by a double burden of undernutrition and overnutrition. Regional research on the causes and consequences of urban overnutrition is (with the exception of South Africa) very much in its infancy.

The lack of attention to obesity in Southern Africa as a whole is likely to be rectified in time but it is important that such research is driven by an appropriate conceptual framework that moves beyond the documentation of individual and household consumption patterns and behaviours. As Glanz et al. (2005) have recently observed:

The widespread prevalence of obesity is poorly explained by individual-level psychological and social correlates of diet and physical activity behaviours. Moreover, advice to simply “eat less and move more” ignores the complex influences of the social and built environments on individuals’ access to affordable, healthful food and activity-friendly communities.

Their suggestion is to focus research and policy attention on various “nutrition environments” (see Fig. 4), defined as the social, policy, and spatial environments that influence access to food and what kinds of food people can access. The model proposes four types of linked nutrition environment: (a) community (type, location and accessibility of food outlets); (b) organizational (the physical and institutional spaces where food is consumed); (c) consumer (the availability and price of and nutrition information about food in food outlets) and (d) information (media and advertising). These inter-linked nutrition environments impact on eating patterns as mediated by various individual demographic, psychosocial or perceptual factors. Attempts to better understand the operation and interaction of nutrition environments have led to the (ongoing) development of the Nutrition Environment Measurement Study (or NEMS). Operationalising a NEMS methodology has proven to be a challenge with most of the focus to date on cataloguing varying consumer and community nutrition environments (Glanz et al. 2007; Saelens et al. 2007; Lytle 2009; Honeycutt et al. 2010). The “nutrition environments” model has not yet attracted much attention in developing countries. Nevertheless, suitably modified, it could be a useful starting point for thinking about priorities in designing a future programme of research on the complex character of the nutrition transition in contemporary African cities.

In this review of the state of knowledge on urban nutrition we have highlighted several emerging issues that need to be considered in a policy-oriented research programme on nutrition in African cities. However, there are a number of additional issues that require attention:

- To date, most of the research on the connections between food insecurity and poor nutrition has focused on physiological outcomes. While impaired brain development in infancy and childhood is one of those outcomes, much less attention has been paid to the psychological dimensions and outcomes of acute or chronic food insecurity on the mental health of adults. There is therefore an urgent need to supplement the focus on nutrition and physical health with a complementary exploration of the relationship between food insecurity, nutrition and mental health.
- Social protection is being widely advocated by international organizations as a way to stave off rural hunger and undernutrition. There is some evidence that the households that receive social grants have lower prevalence rates of hunger for young children as well as older children and adults, even compared to those households with comparable income levels (Devereux 2001). There is also some evidence that social grants have a positive and significant impact on child height-for-age and on women’s health and nutritional status once they reach the age of 60 (Guthrie 2002; Aguëro et al. 2006; Delany et al. 2008). The impact of social grants on the nutritional status of

individuals and households requires much further investigation, however.

- Much of the existing research on the health consequences of food insecurity focuses on nutrition-related disease. However, the question of food-borne disease is of particular relevance in Africa. A recent UNICEF/WHO report notes that undernutrition makes children particularly susceptible to the diarrhoea that kills over one million in Africa every year (UNICEF/WHO 2009). One way in which pathogens are spread is via contaminated food. As the FAO/WHO have noted, “persons suffering from diseases such as HIV/AIDS, tuberculosis, malaria, and other various ailments affecting the region are at a greater risk to be debilitated by unsafe food, as their immune systems are already compromised. Thus, the assurance of safe food is essential to improving the quality of life for those already affected by disease. Equally, persons suffering from food-borne illness are more likely to contract other communicable diseases” (FAO/WHO 2005). Much more research is necessary on the issue of food-borne disease, right across the food supply and distribution chain not just (as has been the case hitherto) among street food vendors (Reardon et al. 2010).
- The state of knowledge about the ‘vicious’ cycle of nutrition and communicable disease such as HIV and TB is particularly relevant in the Southern African context. This literature on HIV and urban nutrition has been reviewed in a previous AFSUN publication (Crush et al. 2011b). However, it is important to re-emphasize the point made there that while there is a considerable body of biomedical research on nutrition and HIV, our understanding of the broader linkages between HIV and urban food security is much less refined.

Urban food security is currently largely ignored by the international and national policy community in favour of an almost exclusive focus on the food insecurity of rural populations. The only significant exception is in the area of nutrition. The nutritional status of the urban poor continues to attract considerable attention, particularly in the biomedical and public health fields (Popkin and Ng 2007). While this is a reasonable starting point for a conversation, food security is not only about nutrition, food fortification and feeding programmes. We need to go much further in thinking through the complete range of possible determinants and remedies for food insecurity under conditions of rapid urbanization. In policy terms, there is an increasing number of programming statements about public health, nutritional, biomedical and epidemiological policy interventions to improve the nutritional and health status of food insecure individuals and households (see for example, Kruger et al. 2005; McLachlan 2006; Benson 2008; McLachlan and Garrett 2008; Gleason 2010; Vorster et al. 2011). As important as these proposals are, however, their effectiveness is likely to be undermined without a broader definition and understanding of the highly complex challenges of food insecurity and the

structural basis of poverty, inequality and food inaccessibility in the rapidly growing urban centres of the sub-continent (McLachlan and Thorne 2009).

Acknowledgments The publication of this paper was made possible by funding from the Canadian Government through the Canadian International Development Agency (CIDA) under its University Partners in Cooperation and Development (UPCD) Tier One Program. We wish to thank our colleagues in AFSUN for their assistance. Appreciation is extended to the referees of this article.

Conflict of interest The authors declare that they have no conflict of interest.

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