Determinants of Food Insecurity among the Urban Poor in the City of Tshwane, South Africa

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Abstract

The extent of household food insecurity in South Africa varies from 20% to 80%, though food security for all citizens is guaranteed in sections 26 and 27 of the constitution and the country is already food secure. The urban poor face particular challenges especially of increased urbanization, high unemployment, high crime rate, and escalating food prices. Attempts to achieve temporary food security might entail disposal of household assets or borrowing money or food from families and neighbors', a situation that could jeopardize the ability to generate income in the future. Family members may seek employment elsewhere, potentially leading to or consolidating existing phenomenon of female headed or child headed households. This paper presents the findings of salient factors determining three categories of food insecurity of sampled 99% black households in Atteridgeville, Soshanguve and Tembisa in the City of Tshwane. Primary data collected from a survey of 900 randomly selected poor households were used in the study. Only data from 827 households were retained for analysis following the conduct of rigorous coherence tests. The food security questions covered household members assessment of own access to food, perceived adequacy of consumption, exposure to risk, and coping strategies. Results from our log it regression model demonstrate that while some degree of food security exists in the study areas, this is boosted by increases in income, the education and employment of household head. As household size, increases, especially of children below the age of five, coupled with relying on help from others, household food security decreases.

Key words: Food Security; Food Access; Urban Poor; South Africa

I. Introduction

The right of citizens to access sufficient food is embedded in sections 26 and 27 of South Africa's constitution. In the same light, the 2030 National Development Plan outlines food security as an important component to the country's vision for economic growth. South Africa is already a food secure country in the sense that the country produces enough of its food staples and also has the capacity to import food so as to any food deficits that may arise in order to ensure its population meets their basic energy and nutritional needs (ITC, 2010). The country is ranked 41st in the 2015 global food security index, the highest ranking for an African country (GFSI, 2015).

A household would be considered as food secure when all its members have access to sufficient food needed to sustain them and live a healthy life (Tonukar and Omotor, 2010:1). This encompasses the ability to secure sufficient food by either producing or purchasing food for all members of the households (FAO, 2010). In this regard, food insecurity at the household level is becoming a challenge in South Africa as majority of households are becoming increasingly food insecure (Altman, Hart, Jacobs, 2009a).

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Results from the general household survey of 2009 (Statssa, 2010) indicate that 20% of South African households have inadequate or severely inadequate access to food. Roughly, 12 million South Africans are food insecure and about 20 percent of the country's population is facing starvation (Joemat-Pettersson, 2013, citing the findings of a study by the African Food Security Urban Network).

Using South African food balance sheets for 1998/99 supplemented with dietary surveys to determine changes in food security, Steyn *et al.* (2001) reported that large sectors of the population were food insecure. Some other estimates of food insecurity in the country are: 50% by National Department of Agriculture (2002), 35% (De Klerk et al., 2004), 52% by Labadarios, et al (2009), and 80% by Jacobs (2009). Also, in 2014, the Human Sciences Research Council and Medical Research Council reported that only 45.6% of South Africa's households are food secure, 28.3% are at risk of being food insecure and 26% are food insecure. These studies essentially draw attention to the severity of food insecurity at the household level nationally. However, the use of these studies for national policy planning is limited as they are silent about the spatial dimensions of food insecurity in the country. Spatial studies of food insecurity would facilitate evidence-based policy planning that relies on credible data to determine which areas, population, and households are food insecure. By having this data available, policy planners could determine which programmes would be suited to particular areas across a wide array of geographical spaces (Alemu, 2015: 5).

Alemu (2015: 5) opines that South Africa is comprised of societies with heterogeneous socioeconomic characteristics. National level studies hence offer little room to make generalizations that will be applicable to every segment of the country. Added to these are methodological and statistical constraints. The former emanates from reliance on households income rather than their actual expenditure on food.

1.1 Statement of the Problem.

Figure 1 summarizes the results of the three National Food Consumption Surveys in terms of the proportion of people who were free from, at risk of and experiencing food insecurity. Overall, between 1999 and 2008 the prevalence of food insecurity in South Africa appears to have been reduced by more than half, from 52.3% to 25.9% (Labadarios, 2011). Food insecurity was lowest in Western Cape during 1999-2008 but the sharpest decline was in Northern Cape and Gauteng Provinces.

Fig.1: Food insecurity at the provincial and national levels according to three national surveys spanning 1999–2008, South Africa
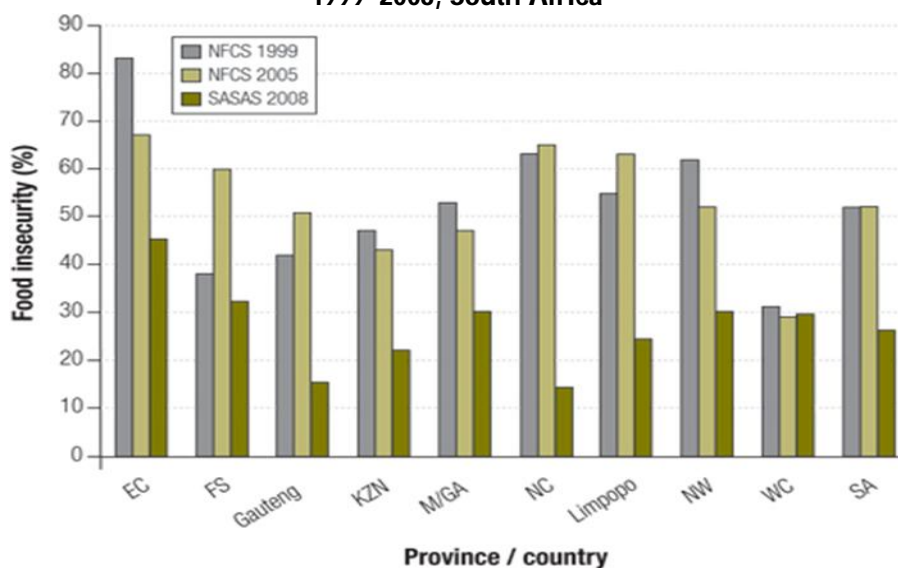
Source: Labadarios (2011).

Meeting the food security needs of the country's population is – and will be – an increasingly urban challenge. Food insecurity, especially severe household food insecurity, is becoming an important issue among the urban poor in South Africa, partly because the incidence inflicts severe suffering among affected households. The political support for food security is however high in the country, as the African National Congress, South Africa's ruling party focused on the issue during the 2009 general elections..

However, the lack of reliable information on the situation of food insecurity in the country is a recipe for ineffective targeting of interventions and hinders initiatives to combat its structural causes (Alemu, 2015: 5). It is estimated that South Africa's population is currently more than 60% urbanized, a situation that is projected to reach 80% by mid-century (Todes et al, 2010). Increased urbanization imposes stress on family welfare in a country experiencing high unemployment rate and high crime rate. Rapid urbanization creates demographic and economic challenges, leading to urban food insecurity (Ravallion, 2002). The capacity of the urban poor and middle class to purchase the good-quality food they need is undermined by a number of factors: currency devaluations; reduced purchasing power; salary reductions; formal-job retrenchment and the informalisation of employment; elimination of subsidies for needs such as food, housing, transportation, and health care; and the very uneven access of different income groups to retail food within cities (Mougeot, 1999).

Escalating food prices and associated cost of living in urban areas do not have sympathy for the urban poor. The cost of the standard Statistics South Africa food basket, expressed as a share of the average monthly income of the wealthiest 30% of the population, is only 2.9%. In contrast, this cost for the poorest 30% of the population was a heavy 36.4% in October 2011 (Payne, 2011).Rising prices of wheat and maize, which form part of the staple foods in South Africa, have increased in world markets (Heady & Fan, 2008), worsening food insecurity condition as households experience more difficulties in procuring food items from their earnings. Some other factors contributing to food insecurity among South African households include increases in the cost of electricity and oil prices. When the cost of transportation increases, the situation forces food prices to increase proportionately (Altman *et al.,* 2009b). This led to Crush and Frayne (2010) to describe urban food insecurity as being invisible, given that most of the earlier emphasis had been on rural food insecurity..

Statistics South Africa (2011) suggests that many South African households are unable to purchase food primarily because their purchasing power is limited by a scarcity of income generation opportunities. The landless and female-headed households, together with both the rural and urban poor, are the major groups most affected (Heady & Fan, 2008). Attempts to achieve temporary food security might entail selling household assets or borrowing money or food from families and neighbors', a situation that could jeopardize the ability to generate income in the future. Searching for means of assuring food security may involve family members seeking employment elsewhere, a situation that might lead to or consolidate existing phenomenon of female headed or child headed households. It is therefore important to examine this and other issues in the context of poor households in the South Africa's Capital, the City of Tshwane. Residents of these townships are 99% black, where unemployment rates also rage between 22% and 25% fuelling the already high crime rate. More than half (51.07%) of the population earn no incomes at all.

1.2 Study Motivation

The City of Tshwane is the administrative capital of South Africa. It is located in the north-western corner of Gauteng Province covering approximately 13% of the Province's surface. The City of Tshwane is one of the six largest metropolitan municipalities in South Africa and the second largest in the Gauteng Province, as measured by Gross Domestic Product (GDP). It contributes at least 26.8% of the Gauteng Province's GDP and 9, 4% of the GDP of the national economy (Statssa, 2015). The City was established in the year 2000 through the amalgamation of 13 diverse and politically polarized municipalities, resulting in its subsequent description as a "Tale of Two Cities". This is because there is a stark contrast between the southern half of the city, which is populated by people who are relatively affluent, and the north, in which most of the people are poor and disadvantaged. The total population of the City of Tshwane (CoT) was 3.1 million in 2015. The working age population accounts for 71.1% of the total. Overall unemployment rate is high at 24.2%, youth unemployment is even higher at 32.6% (Statssa, 2015a). There are 911, 536 households in the City of Tshwane of which 35.8% if female headed. The average family size is 3. Unemployment rate among Africans was 25.7% in 2013 (CoT, 2015). Steel, 2008 suggests that in order to understand cities properly, we need to look at them through food (Steel, 2008). Approximately 213 563 households in the City experience continued poverty which is manifested in the form of food insecurity, ill health and arduous work for low returns. Majority of households living in the North West and North East of the City of Tshwane are low income households. There are 171 910 and 41 653 households earning between R1 and R4800 per month. On top of this, access to food through own production continues to be a challenge in the City of Tshwane (Makwarela and Magolela, 2009).

According to Statssa (2015b), the total populace of study area stands at 842 899. Of these, those who do not earn any income at all total 430 509, representing more than half (51.07%) of the population. According to Statssa (2015b), Tembisa has the highest rate of unemployment in the study area, with 25% of the population being unemployed. This is followed by Soshanguve at 23% and lastly Atteridgeville at 22%. The percentage of discouraged work-seekers was 5% in Soshanguve and 3% in both Atteridgeville and Tembisa.
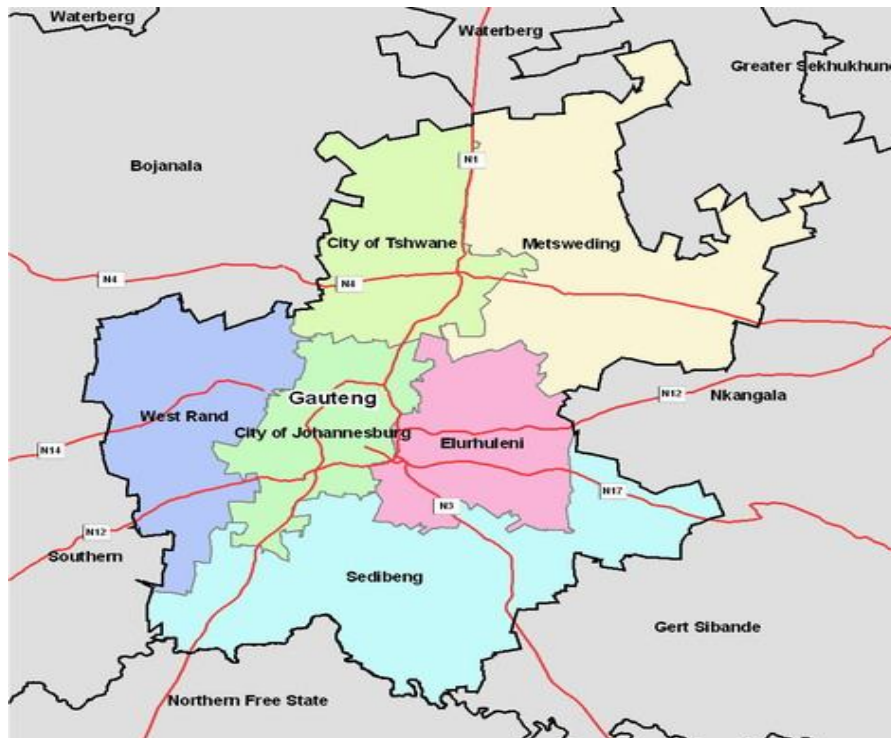

Figure 2: Map of Gauteng Province which also shows the location of Tshwane

After this discussion of the background situation, four other sections will follow. The second section reviews salient literature on the determinants of household food security status while section 3 highlights data sources and the manner of estimating indices of household food insecurity used in this study. Section 4 presents data analysis and results of the logistic regression. The last section concludes the paper.

2. Selected Review of Literature on the proximate Determinants of household's food security status

Smith *et al., (*2000) identify a number of factors that contribute to food insecurity at the household level. These include political instability, civil friction and wars, macroeconomic imbalances, environmental degradation, poverty, increased population, gender discrimination, poor health and illiteracy**.** Abdu-Raheem and Worth (2011) categorize these factors as follows:

(a) Insufficient food availability at the national level, resulting in food insecurity at the household level;
(b) Insufficient household food production or lack of economic power to purchase food; and
(c) Inequitable intra-household access to food.

The literature also identifies salient proximate determinants of household food security. Households' income is the total monthly income of households from all sources. It is the most critical determinant of food security at the household level. Poorer households are more likely to experience food insecurity compared to the well-to-do ones (see Jacob, 2009). However, increases in income lead to increased food consumption among poorer households (Alderman, 1986). Educational attainment of the head of the household tends to have a positive effect on household food security. This implies that as the household head acquires more education, the likelihood of food insecurity diminishes (see Shumiye, 2007; Bashir *et al.,* 2012:7). This because educated household heads have high likelihood of attaining improved financial resources (see, Pankomera*et al.,* (2009:3) and better job opportunities (Heidhues, 2009).

D'Haese*et al.* (2011:66) observed that MHH experience less food insecurity than FHH because women usually do not have sufficient access to productive resources and also have low educational levels. Gebre (2012:165) found increased vulnerability to food insecurity in households headed by females in Ethiopia. This is because women are not always engaged in income-generating activities for food consumption. Furthermore, FHH spent a large proportion of their income on food compared to MHH; however, they are still worse off in terms of food insecurity (De Cock, 2012:38). Studies elsewhere by Carter *et al.* (2010:3), De Cock (2012:38), Kassie*et al.*, (2012:5), Benjamin, and Joseph (2012:22), among others, find that incidents of food insecurity are much higher in female-headed households compared to male-headed households. This is corroborated by the finding of Frayne *et al.* (2009:16) that among the three biggest cities in South Africa, female-headed households are hit hardest by incidents of food insecurity. Bashir *et al.* (2012:7), Omonona et al (2007: 403), Kassie*et al.*, (2012) find a negative relationship between the age of household head and food security. Households comprised of older members, retirees might have serious food security challenges because of reliance on low income, such as pension, inability to actively participate in the labour market, even at the informal level. This could be compounded if they have specific dietary requirements necessary to sustain them at old age. Large household sizes put strains on food consumption (Olayemi, 2012:137). The employment status of the household head is expected to affect household food security positively.

A study by Cancian and Reed (2009:21) suggests that a household where the head is married or living together with a spouse has a greater chance of avoiding food insecurity, because the spouse is likely to contribute to the means of getting food. Mwaniki (2011:1) links food insecurity in developing nations to the inability of households to access sufficient and adequate food due to absolute poverty. This may suggest that increasing income among the severely food poor, might be essential to ameliorate food insecurity among them. Important sources of cash income for households include formal employment, direct cash transfers, or engaging in trading activities. These incomes are necessary because they are used in financing food purchases and non-food expenditures including the accumulation of assets for the household. It is within this context that social grants from the state, help (remittances from well off relatives or neighbours) become important. Social grants increase household income and have been shown to increase women's purchasing power as well as their access to food (Netshitenzhe, 2007).

Studies by Miller *et al.* (2011), Adatoand Basset (2012), among others, emphasize the importance of social security to improve food security by improving food access. Eyal and Woolard (2011) point to an association between Child Support Grant (CSG) receipt and the likelihood of the caregiver being in the labour force. Patel *et al.* (2012) find that CSG enhances women's power and control in household decision-making over finances. Following receipt of social grants, monthly food consumption expenditures rise among recipients. Martinez (2005) finds that beneficiaries of pension transfers in Bolivia invest these grants in smallholder agriculture in Bolivia, which impacts positively on household food consumption, increasing it by twice the amount of the transfer received. CSG allows recipients to meet some of their children's basic needs, and thereby ameliorate some of the extreme consequences of poverty. Authors suggest that it is being directed to major categories of food, clothing and schooling related expenses more generally (cre`che fees, school lunches, school transport) (see Du Toit & Neves, 2009). Ndlovu et al (2014: 2) report that an extra R1140 received by a household in old-age pension increases food consumption expenditures by at least 24%. Similarly, the receipt of an extra R1000 in other types of social grants increases food expenditures and home consumption by approximately 25%.

3.1 Sources of Data Used in this study

Primary data collected from 900 randomly selected households have been used in the study.   However, from the survey, only data from 827 households were retained for analysis following the conduct of rigorous coherence tests. The survey was conducted in Attridgeville, Soshanguve, and Tembisa, three of the poorest residential areas of the City of Tshwane Metropolitan Municipality, in the Gauteng Province of South Africa. Structured questionnaires, administered face-to-face, used to collect data were developed in English and simplified as a tool to capture information (Babbie 2001; Bailey, 1987). Questionnaires were further sub-divided into a cluster of sections that sought to attain structured logical methods of obtaining answers and further to avoid possible omissions of important questions.

The survey questionnaire consisted of questions covering household's background socio-economic information, household composition and profile of household head, household assets, sources of income, and household expenditure by type of expenditure, household food insecurity access scale (HFIAS), and survival strategies. To measure food security, we asked the household head or other household members about their own assessment of access to food, perceived adequacy of consumption, exposure to risk, and coping strategies. The full sample consists mainly of poorer households in the study areas. In this context, poorer household income categories were limited to six namely: R1-500, R501-1000, R1001-1500, R1501-2000, R2001-2500, R 2500 and above.

3.2 Estimating Household Food Security

Households differ in their degree of vulnerability to food insecurity and some households, for a number of reasons, are more vulnerable than others are. As such, in order to determine household food security status, this study administered a questionnaire that sought to probe individual respondent's behaviors and experiences associated with difficulty in meeting food needs are asked in a survey. The USAID developed Household Food Insecurity Access Scale (HFIAS) was used in the study. This scale was used to determine if households became vulnerable to food access in the past 30 days. Basically, the scale comprises of nine specific questions which questions the changes that a household has undergone with reference to their diet or consumption patterns that are related to the lack of resources to purchase or produce food. The generic nine HFIAS questions were posed to all households surveyed and their responses were computed and analysed.

The administered household food security questionnaire consisted of twenty questions concerning the experiences of food insecurity of respondents. Each item was followed by a frequency of occurrence question, which assessed how often a given condition occurred. A negative response to the initial item was scored as "0", and the follow up questions were scored as follows: rarely = "1", sometimes = "2" and often (or always) = "3". The HFIAS scale gives a picture of households in different food security levels based on their position on the scale of 0 - 27. The portfolio collection method was used to determine the extent of household food insecurity. It uses the frequency of occurrences and limitations in classifying each case of food insecurity. In order to determine food security, it is a requirement that the answers to the nine questions be 0 or 1; and if there are such answers as 2 or 3, they may not occur more than once. In brief we expect answers here to be mostly no (= 0) with some tolerance for yes (= 1) and really no more than one question whose alternative responses are spread over of 2 or 3 options. For households to be categorized as severely food insecure, the questions that are posed cover those for which responses are spread into three namely: rarely, sometimes, and often. As such the majority of household that are severely food insecure would have responded in one way or another to many questions whose responses are spread over three possible answers and at the same time respond at least one yes or no question. The other two categories of food insecurity will fall between the two extreme cases.

In order to determine food insecurity, households that answer at least three or more conditions of food insecurity are classified as food insecure, meaning that, they were at times unable to acquire adequate food for one or more household members. Food Secure households are those that do not worry about food access and rarely experience anxiety about not having enough food. They are able to have a full meal three times a day without food running out. Household's food (in) security categories are explained as follows:

1. Food Secure: Households do not worry about food access; rarely experience anxiety about not having enough food. They are able to have a full meal three times in a day without food running out
2. Mildly Food insecure: Household anxious about not having sufficient food, usually consume inadequate diet but they do not experience going whole day without eating or going to bed hungry.
3. Moderately Food insecure: Households began sacrificing quality on a continuous basis by consuming inadequate diet and eating less preferred food. Reduce food intake by eating once or twice a day.
4. Severely Food Insecure: Household experience high incidence of food security, the condition of reducing meal size and number of meals worsen each day. Conditions of going whole day without eating, going to bed hungry or running out of food occurs more often

Levels of food security in the three locations of the City of Tshwane are principally related to household income and the ability to access food through purchase. Reasons why particular households may be classified as food insecure could be because they either had insufficient money to purchase food or the possibility that their food supply did not last.

4.1 Data Analysis

Data were captured in Microsoft Excel (MS Excel 2010). Statistical Package for Social Sciences statistics (SPSS version 23, Chicago, IL) was used for all analyses. Descriptive analyses were completed. Pearson correlations were run to determine bivariate linear relationships between variables that were continuous variables. The significance level was set at $P<0.05$ or higher. The majority of individuals included in the sample were aged between 35 and 45 (26%), 25-35 (23%), 45-55 (23%). Only about 2% of individuals included in the sample were very young, aged less than 25 years. Eleven percent of sampled individuals were fairly old at 56 to 65 years, while older individuals, who were above 65 years accounted for 15% of the sample. Gender plays a vital role in enhancing household food security because food security varies substantially between male-headed households (MHH) and female-headed households (FHH). MHH (66.5%) were more food secure than FHH (58.3%). Food insecurity is mostly prevalent in FHH with mildly, moderately and severely food insecurity of 7.8%, 10.9% and 23.0% respectively. This is opposed to MHH being 8.8%, 6.2% and 23.0%. The higher the family size the more food insecure it becomes. Married respondents are more food secure compared with non-married couples or individuals.

The level of academic achievement has a very high impact on a household's food security. Those with "no schooling" have the lowest level of food security. Food security increases incrementally as education attainment increases from grade 3, grades 4 to 7 and then grades 8-11. Household heads with a tertiary diploma or degree enjoy 100% food security. About 78.7% of households, where the head of household is employed, are food secure with only about 10.5% of them being severely food insecure. Food security improves as more household members are employed. Food security rises steadily with additional member of the household being gainfully employed. When more than five household members are employed, the household is highly food secure and food insecurity is completely eradicated.

Table 1: Selected socio – economic characteristics of household head

Variables	Sample Size(N)	Average Food Security Score
Gender		
Male	340	8.07
Female	487	9.10
Total	827	8.68
Age		
<40	330	6.13
41 - 50	209	6.68
51 -60	124	7.15
61- 64	36	8.42
65+	128	6.65
Household Size		
1	93	5.76
2 - 4	416	6.31
5 - 7	227	7.05
8+	91	7.69
Marital Status		
Never Married	27	6.89
Married	338	5.01
Divorced	405	7.95
Separated	38	7.63
Not Married	5	2.00
Widow/widower	14	4.57
Household Food Security Status		
	Food Secure	Mildly Food Insecure	Moderately food insecure	Severely food insecure

	N	%	N	%	N	%	N	%
Education of Household Head								
No Schooling	90	48.1%	17	9.1%	27	14.4%	53	28.3%
Up to Grade 3	64	57.1%	11	9.8%	5	4.5%	32	28.6%
Grade 4 – 7	104	62.3%	13	7.8%	13	7.8%	37	22.2%
Grade 8 - 11	149	59.6%	23	9.2%	26	10.4%	52	20.8%
Grade 12	55	83.3%	4	6.1%	3	4.5%	4	6.1%
Tertiary Diploma/Degree	45	100.0%	0	0.0%	0	0.0%	0	0.0%
Grand Total	507	61.3%	68	8.2%	74	8.9%	178	21.5%
Employment Status of Household Head								
	N	%	N	%	N	%	N	%
Employed	285	78.7%	22	6.1%	17	4.7%	38	10.5%
Unemployed	222	47.7%	46	9.9%	57	12.3%	140	30.1%
Grand Total	507	61.3%	68	8.2%	74	8.9%	178	21.5%
Household Members' Labour Force Participation								
	N	%	N	%	N	%	N	%
0	164	50.2%	24	7.3%	41	12.5%	98	30.0%
1	205	63.3%	31	9.6%	28	8.6%	60	18.5%
2	100	78.7%	7	5.5%	4	3.1%	16	12.6%
3	13	65.0%	3	15.0%	0	0.0%	4	20.0%
4	9	75.0%	3	25.0%	0	0.0%	0	0.0%
5	6	100.0%	0	0.0%	0	0.0%	0	0.0%
6	2	100.0%	0	0.0%	0	0.0%	0	0.0%
7	1	100.0%	0	0.0%	0	0.0%	0	0.0%
8+	7	87.5%	0	0.0%	1	12.5%	0	0.0%
Grand Total	507	61.3%	68	8.2%	74	8.9%	178	21.5%
Income Statusof Household Head								
	N	%	N	%	N	%	N	%
Categories 1-4 of poor households								
No income	2	20.0%	3	30.0%	2	20.0%	3	30.0%
<2000	130	45.9%	20	7.1%	36	12.7%	97	34.3%
Categories 5-6 of poor households included								
2001-4000	136	59.6%	27	11.8%	23	10.1%	42	18.4%
Non-poor households (categorised by income class)								
4001-6000	71	64.0%	4	3.6%	8	7.2%	28	25.2%
6001-8000	75	84.3%	6	6.7%	2	2.2%	6	6.7%
8000+	93	87.7%	8	7.5%	3	2.8%	2	1.9%
Grand Total	507	61.3%	68	8.2%	74	8.9%	178	21.5%

Source: Survey Data

4.2 Logistic regression model

A logit regression model was utilized to identify the primary determinants of household security. A logistic regression model, also known as logit model, identifies the effects of a number of independent variables on one or two dependent variables. It caters for non-continuous dependent variables, especially when it has only two outcomes viz: zero or one (Baddeley and Barrowclough, 2009:121). It aims to estimate the odds of an occurrence of an event and to predict the effects of the explanatory variables on these odds. The event of the odds denotes the probability that an event will be a success and the probability that an event will be a failure (O'Connell, 2006:11). The probability is represented as follows:

• 1, if p is Success
• 0, if p is Failure

When the probability of a success is greater than the probability of a failure, the odds are greater than (0.1) and when the probability of a success is less than the probability of failure; the odds are smaller than success (Simonoff, 2012:1). The binary response is represented by random variables of, $Y_1,........$ with 0_i = prob(Y_1=1). For each 1......, n there is a row vector $x_i = (x_{i1}, ...,)$ of the explanatory variable (Cox and Snell, 1988:26).

Our analysis sought to determine the impact of demographic and socio-economic variables such as gender, age, household size, marital status, employment status, educational attainment, household income, and access to social grants and help from others, on household food security.

The regression model used in this study is defined as follows:

$$HHFIS_t = \beta_0 + \beta_1 GENDER_i + \beta_2 AGE_i + \beta_3 HHSIZE_i + \beta_4 MSHH + \beta_5 EDU_i + \beta_6 ESHH$$
$$+ \beta_7 INCOME + \beta_8 ASSG_i + + \beta_9 LFPHM_i + \beta_{10} LOCATION_i + \beta_{11} ACCESS_i + e_t .... (1)$$

Where $HHFIS_i$ = food insecurity status (1 if household i is food secure and 0 if household i is food insecure);

• $GENDER_i$ = Gender of household head. Benjamin and Joseph (2012:22) note that several studies conclude that female-headed households are mostly affected by food insecurity than male-headed households. Therefore, in this study it is anticipated that there is an increased likelihood that male-headed households are likely to be food secure than their female counterparts. A dummy variable was used to represent this variable:

$GENDER_i$ is represented as Male = 0; Female = 1.

• AGE_i = Age of household head. Age is said to have an effect on household food security. Kassie et al. (2012) observed that there is an inverse relationship between age of the household head and household food security. Age of the household head was used as an indicator for the experience of household food insecurity. In this study, age is measured in years because it is a continuous variable.

• $HHSIZE_i$ = number of family members in one household. It is argued that the larger the household size, the higher the anticipation of more food consumption in a household (Olayemi, 2012:137). In the study, it is expected that households with economically active and employed members are more food secure than household with members who are unemployed does. Therefore, depending on the outcome of the results, the household size will have a positive or negative effect on food attainment.

• $MSHH_i$ = Marital status of household head. A study by Cancian and Reed (2009:21) concluded that a household with a head and a spouse has a greater chance of avoiding food insecurity, because the spouse is likely to contribute to the means of getting food. It is argued that single household heads bear a large burden on the attainment of food as they usually enjoy a limited support structure (Kaloi et al., 2005:70). There was a need to include this variable because limited information is known about the relationship between marital status and food security (Hanson et al., 2007:1460). Although this question had six options for the participants (Never Married, Married, Divorced, Separated, Living together, Widow/er), a number were grouped for ease of analysis and interpretation. The following dummy variable was used to denote this variable:

$MSHH_i$ = 1 (Married/living together) or 0 (Otherwise).

• EDU_i = Education of Household head. Education is described as a social capital which has a positive effect on household food security (Babadunde et al., 2007:354). The level of education determines whether an individual has better access to job opportunities in the labour market (Kuwornu et al., 2013:35). It was expected that households heads with higher educational qualifications will have a higher chance of being food secure. The analysis on education was based on the household head only.

• $ESHH_i$ = Employment status of household head. Employment status is expected to affect household food security positively. In the questionnaire, the employment status was classified into three categories (formally employed, informal activities, and unemployed). For simplicity, a dummy variable was used to outline the variable:

$ESHH_i$ = 1 (Employed) or 0 (Not Employed).

• $INCOME_i$= total monthly income of a household

Monthly income in the study refers to income received by members of a household from all sources within a month. Income is regarded as the most important determinant for food security in a household (Onomona et al., 2007:404). In this study total monthly income is expressed in Rand value and it is expected to positively affect household food security. Monthly income was kept as a continuous variable.

•$ASSG_i$= whether the household receives one form of social grant or the other or help from family, neighbors' and friends.

• $LFPHM_i$= Labour force participation of household members i.e the number of members of the particular households that are participating in the labour force.

• $Location_i$= whether the household is located in Attridgeville, Soshanguve or Tembisa

• $ACCESS_i$ = stand for access to food. Access to food through own production is still a challenge in the City of Tshwane. Many City residents are more dependent, compared to their rural counterparts, on the cash economy in order to acquire food.   Maxwell et al (2010) established that urban households in Accra, Ghana, purchased more than 90% of the food they consumed. In this kind of situation, any disturbance to urban food system will invariably push households to food insecurity.

5. Results and concluding remarks

In a food secure country, the urban poor in South Africa face household food security challenges. During 1999- 2008, food insecurity was lowest in Western Cape during 1999-2008 but the sharpest decline was in Northern Cape and Gauteng Provinces. Among other reasons, increased urbanization imposes stress on family welfare in a country experiencing high unemployment rate and high crime rate. Escalating food prices and associated cost of living in urban areas do not have sympathy for the urban poor.

Food insecurity may lower a country's Gross Domestic Product. This will have dare consequences for Africa's second largest economy and the continent's most advanced. Attempts to achieve temporary food security might entail disposal of household assets or borrowing money or food from families and neighbours, a situation that could jeopardize the ability to generate income in the future. Family members may seek employment elsewhere, a situation that might lead to or consolidate existing phenomenon of female headed or child headed households. Our current study adds to the limited evidence available in South Africa on food insecurity in low-income urban areas, especially in wealthy provinces.

Results from our logit regression model demonstrate that while the absence of mild food insecurity exists in the study areas, this is boosted by increases in income, and employment of household head. These results are highly significant. Moderate household food insecurity exists in the study areas; this is decreased by increases in income, receipt of old age pension, the education, and employment of household head. These results are also highly significant. Severe household food insecurity does not exist in Soshanguve and Tembisa. The situation of lack of severe food insecurity is boosted by increases in income only. Receiving help from others like neighbors' family and friends, increases household dependency on others and in the process contributes to household food insecurity. As household size increases, especially of children below the age of five, as well as those between 6 and 13 of age, child dependency increases and eats deeply into household finances and thereby contributes to food insecurity. These results are also highly significant.

It is important to understand these results in terms of the experiences of Africans and their definition of what constitutes a household. In a number of instances, household sizes are increased by the arrival in the townships of rural-urban migrants who are very often distant relatives. It is almost impossible not to offer them temporary accommodation and means of survival. Similarly, young people in the townships are reproductively active and are prone to becoming teenage parents. Also, persistence of divorce and separation, as well as the unwillingness of some marriage eligible men to take up family responsibilities often make young women heads of households. Prevalence of HIV and AIDS and its associated mortality sometimes subjects young children and women to assume the role of household heads. The South African Department of Basic Education recorded 20 000 learner pregnancies in 2014, the highest number was in Gauteng Province at over 5 000(SABC, 2015). It is believed that more than 2% of girls between the ages of 14 and 19 drop out of school in South Africa because of teenage pregnancy.

Under conditions of lack of skills and education, employability is compromised. As teenage mothers, they surrender their kids to their grandmothers for child care. While receiving child grants, teenage mothers do not share these social grants with the kid's grandmothers. The whole situation causes unanticipated increases child raising expenditure for the grandmothers, negatively affecting household food security.

Table 2: Determinants of food insecurity among urban poor household in the City of Tshwane

Dependent Variable is Household Food Insecurity			
Variable	Mildly insecure	Moderately insecure	Severely insecure
C	1.229492 (0.0000)	0.065591 (0.1676)	0.277293 (0.0000)
Location			
Residence in Attridgeville	-1.104881 (0.0001)	0.001833 (0.0522)	
Residence in Soshanguve	-0.992560 (0.0003)	0.095606 (0.0002)	-0.136419 (0.0009)
Residence in Tembisa	-1.033761 (0.0001)	0.081408 (0.0046)	-0.145625 (0.0007)
Child Dependency			
No. of Children under the age of 5			0.075989 (0.0031)
No. of Children under 6-13 years old			0.033158 (0.0782)
Educational Attainment			
Years of schooling of Household Head		-0.007863 (0.0034)	
Employment			
Employment Status of HH head	-0.028673 (0.0129)		
No of HH members employed		-0.030393 (0.0008)	
Social Grants			
Old Age Pension		-5.81E-05 (0.0014)	
Help from others			7.55E-05 (0.0028)
Household Income			
HH Income R1-500	-0.000410 (0.0241)		
HH Income R501-1000	-0.000114 (0.0233)		0.000142 (0.0007)
HH Income R1001-1500	-5.02E-05 (0.0313)	-9.78E-05 (0.0001)	-5.42E-05 (0.0879)
HH Income >R2000	-8.13E-06 (0.0034)		-1.86E-05 (0.0004)
Diagnostic Test Results			
R-squared	0.060297	0.071566	0.116118
Adjusted R-squared	0.051106	0.061567	0.103355
S.E. of regression	0.267757	0.276978	0.398316
Sum squared resid	58.64568	49.86594	87.89519
Log likelihood	-79.22090	-84.88537	-276.0790
F-statistic	6.560926	7.157661	9.097603
Prob(F-statistic)	0.000000	0.000000	0.000000
Durbin-Watson stat	1.892796	1.589060	1.470874

Source: Survey Results

The literature suggests that transportation costs can impinge upon the cash available for food, hence negatively affecting household food security (Furey *et al*, 2001). Food security in the study areas do not appear to be mitigated by proximity to food retail outlets and the cultivation of own food in back gardens.

In examining the three poor townships in the City of Tshwane, it was hoped that particular characteristics of specific townships might encourage the strengthening of social capital which will invariably impact positively on household food security. Receipt of old age pension decreases moderate household food insecurity in the study areas. Grobler (2015) shows that the more households rely on social grants, the higher their level of food insecurity, and the lower their dietary diversity! Receiving help from family members, friends and neighbours during times of hardship was expected to impact positively on food security. Unfortunately, it has a positive coefficient, implying a negative and significant impact on severe household food insecurity. Grobler (2015) suggests that social grants may be insufficient to ensure food security at the household level even in low-income neighbourhoods. It may also be an indication that social grants may not be directed, in the main, towards food purchases, thus lowering the ability of social grants to creating food secure households in South Africa.

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