

-RESEARCH ARTICLE-

## AN ANALYSIS OF HOUSEHOLD FOOD SECURITY: A CASE STUDY OF TOWNSHIPS IN GAUTENG SOUTH AFRICA

**Hannah Mayamiko Dunga**

Faculty of Management Sciences, Vaal University of Technology, South Africa

Email: hannahd@vut.ac.za

ORCID: 0000-0001-9999-9245

**Steven Henry Dunga**

North-West University

Faculty of Economic and Management Sciences, Vaal Triangle Campus, Vanderbijlpark

Email: steve.dunga@nwu.ac.za

ORCID: 0000-0002-0911-144X

### Abstract

*Poverty alleviation as espoused as goal number one in the 2030 global agenda requires serious attention if the objectives are to be achieved. There is a symbiotic relationship between poverty and food insecurity, which feeds into other deprivations, such as malnutrition and high morbidity among children and unemployment among adults. The global agenda 2030 recognises the importance of food security so much that goal number two of the sustainable development goals is to end hunger by 2030. The South African government also recognises the importance of food security and ranks ending food insecurity as one of the main goals of the development blueprint termed the national development plan (NDP). The main objective of the study was to analyse the food security status of townships in Gauteng; to achieve this, the paper used data that was collected from 587 households in selected townships in Gauteng. Descriptive statistics, cross-tabulations and a multinomial regression model were used to analyse the food security status and the determinants of food insecurity among the households in the sampled townships. To measure food security status, the study used the Household Food Insecurity Access Scale. The food security status results showed that approximately 40 percent of the households were severely food insecure, over 30 percent were moderately food insecure, less than 10 percent were mildly food insecure and 20 percent were food secure. The regression results indicated that income, employment status and household size were among the factors impacting the households to achieve a positive food security status. The results imply that there is a need for a concerted effort in dealing with food insecurity especially focusing on access to food at the household level. The study suggested that policymakers look closely at what other countries are doing to improve the*

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*food security status in their countries primarily focusing on the coping strategies employed.*

**Keywords:** Food security, households, household food security access scale, MLR model

**JEL classification:** A10 D10 D13

## 1. INTRODUCTION

Food security and lack thereof have been one of the hindering factors to the full attainment of national goals in many countries (United Nations, 2018). In trying to determine the main causes of this problem, there is also a need for proper definitions of the term to explain it in depth. The term food security originated in the mid-1970s when nations came together for a world food summit in Rome (FAO, 1996). The Rome summit was just the beginning of up-hauling the hunger problem whose roots are so deeply rooted in many other facets of society other than food availability. Over the years, the term food security has been highly researched expounding on the causes and how to clearly define it so that approaches to dealing with it are properly conceived. By the end of the 1980s, a better definition of the term food security was agreed upon (FAO, 2003). It was decided that food security should be regarded as a multidimensional phenomenon that incorporates the availability of food, access to food as well as stability of food supply (FAO, 2006). As the years progressed, different changes were made to the definition of food security to incorporate other wider complexities of the technical and policy issues involved around the term. As such, the most recent definition of food security was redefined in 2001 as a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for active and healthy lives (FAO, 2001).

This is more evident in developing countries where, among other things, poverty levels are also high. The problem of food insecurity, therefore, has been ongoing for many years (FAO, 2019). The report highlights the fact of increasing world populations of undernourished people with over 820 million people suffering from hunger, with Africa having the highest increase rate at 19.9 per cent in 2018. Further looking at the food security status of the population by categories, 9.2 per cent of the world population (or slightly more than 700 million people) were exposed to severe levels of food insecurity in 2018, implying reductions in the quantity of food consumed by the affected group to the extent that they have

possibly experienced hunger. The report further highlighted a broader look at the extent of food insecurity beyond severity levels and hunger levels, that an additional 17.2 per cent of the world population, or 1.3 billion people, have experienced food insecurity at moderate levels, meaning they did not have regular access to nutritious and enough food. Combining the moderate and severe levels of food insecurity, the report shows an estimated total of 26.4 per cent of the world was in the food insecure category, which amounts to approximately 2 billion people. Just like many developing countries, South Africa also grapples with the problem of food security. According to StatsSA's most recent data on food security, in 2017, 6.8 million South Africans experienced hunger and this was mostly profound in black African and coloured households (StatsSA, 2019). This shows the problem of food security is far from being resolved. Dealing with food insecurity at household level remains the goal and it can only be done by understanding the food insecurity situation at the household level and its attendant circumstances. To achieve the main objective of the study, the study measures the food security status of households in South Africa and then identifies the determinants of food security in the sampled townships.

## **2. LITERATURE REVIEW**

### **2.1 Food insecurity measure**

Addressing the problem of food security can be challenging; just from the definition of the term itself, it is shown how complex this phenomenon is. The problem sometimes rests on the measures used to justify the severity of its existence. As such, there exist different types of measures of food security. The study adopts the nine-question food insecurity scale access scale (HFIAS), which has been validated cross-culturally. It was developed by the funded Food and Nutritional Technical Assistance (FANTA) project under the United States Agency for International Development (USAID) (Coates, Swindale & Bilinsky, 2007). The HFIAS is based on the impression that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarised in a scale. Once the data is obtained, the HFIAS score is then calculated as a continuous measure of the degree of food insecurity (access) for the past four weeks (30 days), which adds up to a score of 27 for a household that has severe food insecurity to a minimum score of zero for households that are food secure. Households are then classified into four categories, starting with food-secure households, then mildly food

insecure, moderate food insecure and lastly severe food insecure ranked into categories one to four, respectively (Coates, *et al.*, 2007:20).

## **2.2 Literature on household food security**

The severity of the problem of food insecurity has been extensively researched in different countries bringing in mixed results. Robert Aidoo *et al.* (2013), in Ghana, studied the determinants of food security and found that larger households, farm size and access to credit were the main determinants affecting food security in the country. Similarly, Sisha (2020), in Ethiopia, Abdullah *et al.* (2019) in Pakistan, and Faridi and Wadood (2010) in Bangladesh examined food security in those countries and the results were similar to what was found in the study conducted in Ethiopia and more in the sense that several other socio-economic activities such as schooling of members of the household, proximity to service centres, assets and availability of credit services positively affect household food security.

Other similar studies have also been conducted in South Africa and Nigeria (see Grobler, 2015; Weiser *et al.* 2015; Arene, 2010; Dunga, 2020). Food insecurity has so many detrimental effects on humans, as it is impossible for one to stay on an empty stomach for so many days. The Weiser *et al.* (2015) study looked at the relationship between food security and health, and the results showed that food insecurity contributed to poor health. This could be because food-insecure and low-income people can be especially vulnerable to poor nutrition and obesity, due to additional risk factors associated with inadequate household resources (Ibid). Food insecurity may also be linked to poverty as it is evidenced that poor households who are more likely to earn low incomes are in most cases found to be food insecure (Cock *et al.*, 2015). With the increase in numbers of food insecurity in many developing countries, South Africa included, it shows that the problem is far from being solved. As such, it is empirical to conduct more research towards food security to understand the depth of the problem. The next section discusses the methodology of the study.

## **3. METHODOLOGY**

This section presents the methodology of the paper. It outlines both statistical and econometric methods that will be used in the study.

### **3.1 Data analysis**

To achieve the main objective of the study, the study used primary data that was collected from townships around Gauteng in South Africa. Using a well-structured questionnaire, a total of 587 households were involved in the survey. To determine the sample size, the study followed the recommendations by Gujarati (2004) that, for statistical purposes, especially when one applies the central limit theorem, any sample of 30 and above is considered large enough to perform basic statistical procedures. The households were randomly selected based on the available maps of the dwelling units in the area, whereby a supervisor walked around the research area and selected every fourth house. If, for some reason, access was not granted at a household, the household was skipped, and a next household was selected. Only heads of households were interviewed after receiving their consent on food security used in the household. The survey was conducted by experienced enumerators who were first trained on the issues that were of interest.

### **3.2 Model specification**

As discussed in the previous section, the study used the household food security access scale (HFIAS) to measure the food security status of households. To analyse the data, the study employed the Statistical Package for Social Sciences (SPSS). Several steps were followed in the study to achieve the main objective, which was, firstly, the descriptive analysis of the study; secondly, the cross-tabulations result that explains the relationship of different variables in particular that of food security and different household characteristics; and lastly, the study shows the results of the regression model employed in the study. The study employed a multinomial regression to determine the factors affecting the household's food security. As described by Field (2009), a multinomial regression model is similar to a binary regression model where both models have a categorical dependent variable. The major difference lies in the fact that a multinomial regression has dependent variables with more than two discrete and non-ordered categories that have nominal properties, and exhibit multinomial distribution, which is an expansion of the binomial logistic distribution for the category. Many other noticeable benefits of a multinomial regression model have been highlighted in literature, such as Tabanick *et al.* (2001) who contended that with a multinomial logistic regression technique, the assumptions are different in a way that they are easily interpretable diagnostic statistics. Multinomial logistic regression does not assume a linear relationship between the dependent and independent variables; independent variables need not be an interval, it is more

robust to violations of assumptions of multivariate normality and equal variance and covariance matrices across groups. MLR does not require that the independent variables is unbounded; and lastly and that normally distributed error terms are not assumed. A similar model was employed by Dunga (2017) in a study conducted in Malawi.

In this study, a multinomial logistic regression was employed to determine the food security status of households based on the four HFIAS categories. In this case, the four HFIAS categories 1) food secure, 2) mildly food insecure, 3) moderately food insecure, and 4) severely food insecure were used as dependent variable. The independent variables included age of household head, income, household size, gender and employment status. In an MLR model, the estimates of parameters can be identified and compared to a baseline-category of the dependent variable, which, in this study, was severely food insecure.

The regression model is stated as follows:

$$P_{ij} = \frac{\exp(\beta_j X_i)}{1 + \sum_{j=1}^4 \exp(\beta_j X_i)} \text{ For } j = 1, 2, 3, 4 \dots \dots \dots (1)$$

Where  $x_i$  is a vector of contextual socio-economic characteristics of the  $i$ th household,  $\beta_j$  is a vector of regression parameter estimates associated with alternative  $j$ . The coefficients of explanatory variables on the omitted or base category are assumed to be zero. The probability that a base category will be chosen is calculated as:

$$P_i = 1 | X_i = \frac{1}{1 + \sum_{j=1}^4 \exp(\beta_j X_i)} \dots \dots \dots (2)$$

The probabilities of the household being in the other three categories ( $j = 2, 3$  or  $4$ ) can be estimated

$$P_i = (j = m | x_i) = \frac{\exp(\beta_j X_i)}{1 + \sum_{j=1}^4 \exp(\beta_j X_i)} \dots \dots \dots m > 1 \dots (3)$$

Finally, the multinomial regression model to estimate the determinants and causes food insecurity levels in the four categories or groups was specified as:

$$P_{ij} = \ln(P_j/P_i) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} \dots \dots \beta_n X_{ni} + \varepsilon_i \dots \dots \dots (4)$$

Where the parameters estimated  $P_{ij}$  is the probability of households falling into either of the four categories of food insecurity level, which are: 1) food secure, 2) mildly food insecure, 3) moderately food insecure, and 4) severely food insecure.

$B_0$  is the intercept term

The subscript  $i$  denotes the  $i$ th observation in the sample

The estimated coefficients do not directly indicate the effect of change in the corresponding explanatory variables on the probability ( $P$ ) of the outcome occurring. Rather, the coefficients reflect the effect of individual explanatory variables on the odds ratio of the dependent variable (Menard, 1995; Schwab, 2002).

The other parameters are defined as follows:

$$\beta_{1,2,\dots,n} \rightarrow$$

are the coefficients corresponding to independent variables  $X_{1,2,\dots,n}$

$\varepsilon_i \rightarrow$  is the error term of the regression

Applying the discussed model, the regression will have all the variables of interest included as follows:

$$P_{ij} = \ln(P_j/P_i) = \beta_0 + \beta_1 X_{AGE} + \beta_2 X_{LOG-INCOME} + \beta_3 X_{HOUSEHOLD\ SIZE} + \beta_4 X_{GENDER} + \beta_5 X_{EMPLOY.STATUS}$$

$\beta_1$ - $\beta_5$  are the coefficients for the corresponding variables.

The independent variables are explained in Table 1.

**Table 1: Description of explanatory variables**

Variable	Description
Age HH	Age of head of household
Log Income	The income of the household changed to Log Income
h/size	Household size
Gender	Gender household head (1 female 0 male)
EMPLOY/STAT	Employment status (0 employed, 1 not employed)

**Source: Survey data (Dunga, 2020)**

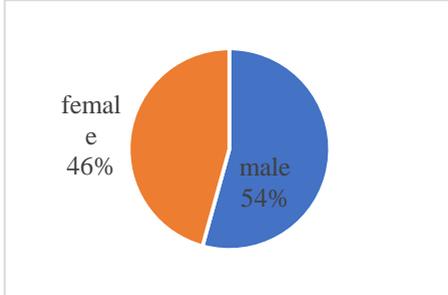
#### 4. RESULTS

This section presents the results of the paper as follows. The first section discusses descriptive results, followed by cross-tabulation results and finally the regression results.

#### 4.1 Descriptive results

Figure 1 presents descriptive results of gender dynamics of household head in the study. As shown, out of the 587 sampled households, 46 per cent of household head were female and 54 per cent were headed by males.

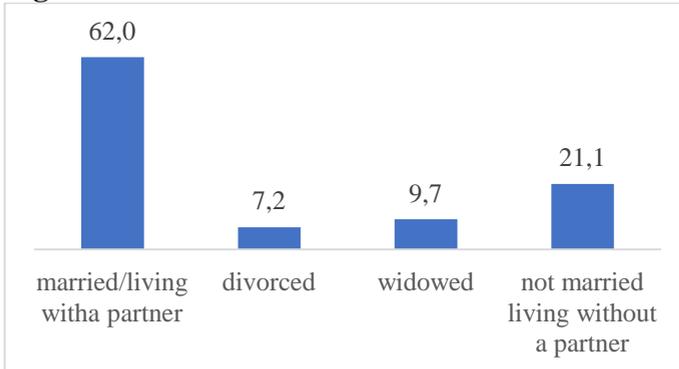
**Figure 1: Gender of household head**



**Source: Survey data (Dunga, 2020)**

The marital status of households in the study, as shown in Figure 2, indicates that a majority of household heads (62%) were married and/or living with a partner; whereas 21% indicated *not married*.

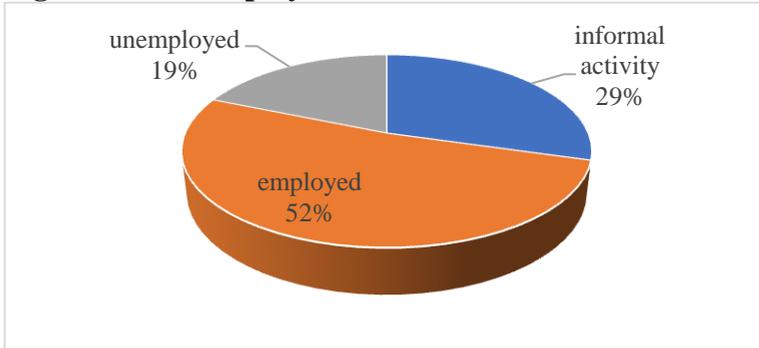
**Figure 2: Marital status of the household heads**



**Source: Survey data (Dunga, 2020)**

The employment status of the household head is one important factor in determining household heads' socio-economic characteristics. Figure 3 presents the results of the study. It shows that 54 per cent of the household heads indicated that they were employed during the time the data was collected. The rest (29%) indicated *employed in informal activities* and 19% indicated *not being employed*.

**Figure 3: Employment status of household heads**



**Source: Survey data (Dunga, 2020)**

Table 2 presents the results of the continuous variables in the study, the first being household total income. Its shows that, on the average, heads of households earned R5 651.81 a month, with the lowest being paid R900 a month. The average age of the household head was 43 and the average household size was six persons.

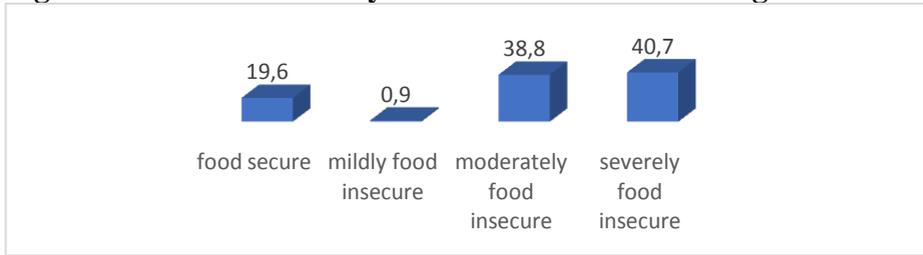
**Table 2: Descriptive analysis results of continuous variables**

	N	Minimum	Maximum	Mean	Std. deviation
Household total income	587	900.00	43000.00	5651.8058	6590.60178
Age household head	587	20.00	88.00	43.1499	11.50225
Household size	587	2.00	16.00	6.4242	2.10208

**Source: Survey data (Dunga, 2020)**

Figure 4 presents results of food security status of households using the four categories of food security employed in the study. Evidence shows that, at the time the data was collected, a higher percentage of the households (about 40%) were found to be severely food insecure and about 20% were food secure. When categorised into two categories of food security, the results could mean that about 80% of the households were food insecure against 20% being food secure. The results are indeed alarming. Just looking at the numbers of food-insecure households is alarming, which is regardless of so many interventions by the government to alleviate poverty in the country.

**Figure 4: Food security status of household in categories**



**Source: Survey data (Dunga, 2020)**

### 4.2 Cross-tabulation results

Table 3 and the next few tables present cross-tabulation results of food security and different variables. The first variable, shown in Table 3, is a cross-tabulation between food security status and gender. The results show that the differences in food security status across categories are not vast; for instance, those who are severely food insecure, according to gender, were 40% male-headed households and 41% from the female-headed households. Similarly, those who were food secure (19.7%) were male-headed households and 19.4% female-headed households.

**Table 3: Cross-tabulation food security and gender**

Variable	male	female	Total
Food secure	19.7%	19.4%	19.6%
Mildly food insecure	0.6%	1.1%	0.9%
Moderately food insecure	39.2%	38.4%	38.8%
Severely food insecure	40.4%	41.0%	40.7%

**Source: Survey data (Dunga, 2020)**

Table 4 shows the results of the cross-tabulation of food security status and employment status of households. It shows that a higher percentage (52%) of those indicated as unemployed were found to be severely food insecure, whereas 33% of those who indicated to be employed were found to be severely food insecure. On the opposite, 27% of those who were employed were food secure, while for those who were unemployed, only 11 per cent were food secure. The results indicate that the employment status of the household head contributed to their food security status, meaning that if more people could find full-time employment, this could improve the food insecurity problems in the country. However, the problem rests on the other percentage of those who are employed,

yet still found to be food insecure. This could be because of the income received from the types of jobs they are in.

**Table 4: Cross-tabulation food security and employment status**

Variable	Food secure	Mildly food insecure	Moderately food insecure	Severely food insecure
Informal unemployment	11.00%	1.70%	42.20%	45.10%
Employed	27.30%	0.30%	38.50%	33.90%
Unemployed	11.80%	0.90%	34.50%	52.70%

**Source: Survey data (Dunga, 2020)**

In Table 4, the study presented results on employment status and food security status. It was evidenced that employment status played a role in the food security status of households. The matter rested on income received. Furthermore, results presented in Table 5 show cross-tabulation between food security and income; it indicates that 60% of household heads who earned between R0 and R3 000 a month, were found to be severely food insecure and only 1% of households in the same category were found to be food secure. However, of those who earned over R30 000 a month, 87.5% were found to be food secure and none to be severely food insecure. The table also shows a positive trend of how households with higher income are also found to be better off in terms of their food security status. Linking income to employment status could mean that those in the lower bracket of income could be employed in low income jobs.

**Table 5: Cross-tabulation food security and income**

Variable	0 to 3000	3001 to 7000	7001 to 15000	15001 to 30000	30001 above
Food secure	1.10%	12.80%	58.60%	88.00%	87.50%
Mildly food insecure	2.10%	1.10%	34.50%	0.00%	12.50%
Moderately food insecure	36.60%	52.40%	6.90%	12.00%	0.00%
Severely food insecure	60.20%	33.70%	0.00%	0.00%	0.00%

**Source: Survey data (Dunga, 2020)**

Table 6 presents the cross-tabulation results of food security category and education level of the household head. It shows that education level played a role in determining the food security status of the household, as shown that 92% of the household heads who had to a post-graduate degree were food secure and none of

those who had attended up to grade 7 were food secure. On the other hand, 40% of those who attended up to grade 7 were found to be severely food insecure.

**Table 6: Cross tabulation food security and education level**

Variable	0 to 7 grades	8 to 12 grades	13 and 14	post grade
Food secure	0.00%	11.40%	67.20%	92.90%
Mildly food insecure	0.00%	1.00%	0.00%	0.00%
Moderately food insecure	60.00%	41.20%	25.40%	7.10%
Severely food insecure	40.00%	46.40%	7.50%	0.00%

**Source: Survey data (Dunga, 2020)**

The cross-tabulation results so far have shown various variables and food security status. The results showed some link between the employment status of household head, income, education status and food security status. As presented in the previous results, households with higher income in better-paying jobs and with high education levels were found to be better off in terms of food security status compared to their counterparts. To further determine the results, the study went further to employ a multinomial regression analysis that is presented in the next section.

### 4.3 Multinomial regression results of determinates of food insecurity

This section presents multinomial regression results for the study; the first tables present the results of the overall test for the regression as follows;

**Table 7: Model fitting information**

Model fitting information						
Model	Model fitting criteria			Likelihood ratio tests		
	AIC	BIC	-2 log likelihood	Chi-square	df	Sig.
Intercept only	1287.933	1301.058	1281.933			
Final	982.168	1060.918	946.168	335.765	15	0.000

**Source: Survey data (Dunga, 2020)**

In a regression analysis, it is recommended to describe the overall test of the relationship between the dependent and independent variables. In this regard, the results in Table 7 reveal that the probability of the model chi-square test was 0.000, which is statistically significant since it is less than 0.05 for the 5% level of significance. Table 8 shows results of the goodness of fit, which works in the

opposite direction to model fitting information in this regard; when the p-value is not significant, it shows the model is of good fit according to Field (2009). In this regard, both statistics for Pearson and deviance are not significant, and therefore the null hypothesis, which is that the model is a good fit, is accepted, meaning the model is adequate of a good fit.

**Table 8: Table goodness of fit**

	Chi-Square	df	Sig.
Pearson	1229.761	1398	1.00
Deviance	796.651	1398	1.00

**Source: Survey data (Dunga, 2020)**

Further to the results in Table 8, are the results of the goodness of fit showing the overall performance of the regression model. In a multinomial regression model, the goodness of fit computes the correlation measure to estimate the strength of the relationship (pseudo R-square measures, such as Nagelkerke’s R). Classification accuracy is also a more useful measure to assess the utility of multinomial logistic regression, which compares predicted group membership based on the logistic model to the actual, known group membership, which is the value for the dependent variable (Field, 2009). In this study, the Cox and Snell R-square and the Nagelkerke R-square value, which indicate the amount of variation in the dependent variable, are used. These are described as pseudo R-square.

**Table 9: Pseudo R-squared**

Pseudo R-square	
Cox and Snell	0.422
Nagelkerke	0.476

**Source: Survey data (Dunga, 2020)**

In Table 9, Cox and Snell R and Nagelkerke R square values are 0.422 and 0.467, respectively, suggesting that 42% to 48% of the variability is explained by these variables used in the model.

### 4.3 Regression results of determinants of food security

This section presents regression results on determinants of food security showing the individual parameter estimates on how the independent variables influence the probability of households to fall in the four levels of food insecurity. As indicated

previously, the model has four categories of the dependent variable (food secure, mildly food insecure, moderately food insecure and severely food insecure). As discussed earlier in the study, severely food insecure was used as a reference point, comparing those who were food insecure and severely food insecure.

**Table 10: Regression results on the determinants of food security**

HFIAS	Variable	B	Std. error	Wald	df	Sig.	Exp(B)	95% confidence interval for Exp(B)	
								Lower Bound	Upper Bound
Food secure	Intercept	-32.226	2.634	149.655	1	0.000			
	AGE HH	0.071	0.020	12.541	1	0.000	1.073	1.032	1.116
	log income	3.584	0.326	121.090	1	0.000	36.001	19.016	68.157
	household size	-0.182	0.104	3.065	1	0.080	0.834	0.681	1.022
	Female	-0.703	0.347	4.120	1	0.142	0.495	0.251	0.976
	Employed	1.368	0.253	29.166	1	0.000	3.929	2.391	6.456
Mildly food insecure	Intercept	-17.082	6.404	7.115	1	0.008			
	age hh	0.000	0.056	0.000	1	0.994	1.000	0.896	1.115
	log income	1.801	0.849	4.497	1	0.034	6.056	1.146	31.997
	household size	-0.008	0.296	0.001	1	0.978	0.992	0.555	1.773
	Female	-0.794	0.941	0.711	1	0.399	0.452	0.072	2.859
	employed	-1.980	1.249	2.514	1	0.113	0.138	0.012	1.596
Moderately food insecure	Intercept	-10.493	1.669	39.540	1	0.000			
	AGE HH	0.028	0.012	5.588	1	0.018	1.028	1.005	1.052
	Log income	1.176	0.221	28.336	1	0.000	3.243	2.103	5.001
	household size	0.012	0.065	0.034	1	0.853	1.012	0.890	1.151
	Female	-0.155	0.199	0.606	1	0.436	0.857	0.580	1.265
	employed	0.412	0.190	4.723	1	0.030	1.510	1.041	2.190

**Source: Survey data (Dunga, 2020)**

Age of household head was significant at 1% with a P-value of 000 and odds ratio of 1.073. This implies that an increase in the age of a household head increases the probability of the household to be food secure from severely food insecure. Additionally, such an increase shows that an additional year in the age of household head increases the odds of the household being food secure by 1.073.

Similarly, age was also found to be a significant variable in predicting the probability of a household to either fall in the moderately food insecure or severely food insecure category. With an odds ratio of 1.028 and coefficient of 0.028, the results also show a positive trend that as age increases, it also increases the odds of a household to be in the moderately food insecure category than the severely food insecure category. This positive trend could be because as people age they tend to mature, and consequently thinking and spending patterns change. Similarly, as people grow, so do their families, and therefore they become more concerned with the livelihood of their families and food and other essentials become a priority in their lives.

The second independent variable was income, since income is in logs, the results are interpreted in percentages. When comparing food secure and severely food insecure, the results show a p-value of 0.000, which is significant at 1%. The results further show an odds ratio of 36.00 and a coefficient of 3.584. The positive coefficient indicates that an increase in income levels of a household increases the probability of the household to rather be food secure than severely food insecure and that a percentage change in household income increases the odds of the household being food secure by 36%. Similar results were found between mildly food insecure and severely food insecure. The positive coefficient (1.801) means that an increase in household income increases the probability to fall in moderately food insecure rather than severely food insecure. The results are similar to what was found in Table 5, which indicated that households with a monthly income of above R7 000 were more likely to be food secure, but it also showed a general trend that as income increased, the food security status of household also increased.

The third independent variable was the household size. Comparing the chances of falling in either food secure and severely food insecure, the p-value was found to be significant at 10%, with an odds ratio of 0.83 and coefficient of -0.182. The negative coefficient value indicates that an increase in household size decreases the chances of the household to be food secure, thereby increasing the chances of the household to be severely food insecure and that the odds of being food secure decrease by .0.83 with an additional member of the family. The other categories were found not to be significant.

The fourth independent variable was employment status, being a categorical variable, those who were not employed were used as a reference category. The

results of the probability of the unemployed to fall in either food secure and/or severely food insecure shows a P value of 0.00, which is significant at 1%, a coefficient of 1.368 and odds ratio of 3.929. The figures represent that households whose heads were unemployed had a lower probability to be food secure and higher chances of being severely food insecure, whereby the odds of households with unemployed head to be food secure increased by 3.929. The indicated results are in line with the third variable, which is income. Households with the unemployed head of households mean they have either no steady income or no income at all, therefore it is most likely for them to be food insecure. Moving to the next two categories (moderately food insecure and severely food insecure), there is a P-value of 0.030, significant at 5% and a coefficient of 0.412, the odds ratio of 1.510, indicating that households whose heads were unemployed have a lower probability to be moderately food insecure and higher chances of being severely food insecure whereby the odds of households with unemployed head to be moderately food insecure increased by 1.51.

## 5. CONCLUSION

The study's main objective was to analyse the determinants of food security status among households found in townships around Gauteng. To achieve this, the study collected data through the survey method from several townships in this area where a total of 587 datasets were collected. To measure the food security status of the household, the study used the household food security assess scale proposed by FANTA. The results of the study were presented in three categories; the first was the descriptive results, which showed the demographics of the study. Secondly, the results on food security status showed that a majority of the households were severely food insecure. Third were the cross-tabulation results between food security and economic characteristics selected in the study. According to food security and gender, the results showed that there was not much of a difference in the food security status of male and female-headed households. Differences were rather found between food security status and employment status, and income. In general, it showed that those with higher income and better-paying jobs were found to be better off in terms of food security status as compared to their counterparts. These results were also found to be evident in the regression results of the study. The results found in the multinomial regression showed that the older people, those with higher income and those with smaller household size were found to be better off in terms of food security status as compared to their counterparts. As for employment status, the

employed were found to be in a much better position in terms of food security status. Gender of household head was found to be insignificant.

The study concludes that it is very important for policymakers to understand the dynamics of these socio-economic characteristics hindering households to achieve the alleviation of food insecurity. As noted with employment status, some of those who were employed were found to still be food insecure; this could be because of them being underpaid. Investigating such factors and many others found in the study might help in making a sound decision by policymakers to improve food security status. Policymakers should also refer to other countries who are seemingly doing better than South Africa in terms of improving the food security status in their countries. Part of these could be the coping strategies employed by the food insecure.

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