

Urban food insecurity and its determinants among migrant households

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Abstract

This study utilized the Linear Probability Model to examine the determinants of food insecurity among migrant households in the Gauteng City region of South Africa. 13,616 households were selected using random sampling and a cross-section design. The study findings showed that age and level of education reduce the probability of skipping a meal among internal and international migrant households. Having medical aid is negatively associated with food insecurity – a sign of affordability. Part-time jobs increase the likelihood² of experiencing food insecurity for both internal and international migrants. Access to indigency and government support were associated with a higher probability of food insecurity among international migrants. Government support in food parcels is also associated with food insecurity for internal migrants. In contrast, ethnicity has no statistically significant effect on food security for internal migrants relative to native residents. Policy focus on inclusivity in social service provision, employment access and urban agriculture can likely help improve the food insecurity status of internal and international migrant households in the Gauteng City Region.

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INTRODUCTION

Approximately 258 million people globally migrate from their country of origin to a host country (United Nations Department of Economic and Social Affairs [UNDESA], 2017). In addition to international migration,¹ countries at different stages of development also experience large volumes of internal migration, due to urbanization processes, compounding issues related to the inability to satisfy the overall demand for public services as well as housing in the places of destination (Tamsin, 2018).

South Africa has a significant international in-migration rate, with about 2.89 million documented individuals accounting for about five per cent of the country's population (Statistics South Africa 2023). Most international migrants migrate for economic reasons, such as opening businesses and employment. The country also experiences a high annual internal migration rate – approximately 850 thousand people temporarily and permanently relocating from rural to urban areas (Ginsburg et al., 2016).

While the Department of Home Affairs' 2024 white paper seeks to introduce quotas for permanent residence and special exemptions to reduce the number of international economic migrants posing as asylum seekers and refugees (Government Gazette, 2024), internal and international migration continue to significantly contribute to population growth and strain local resources. Such strain in turn translates into higher food insecurity for the local population (Senyo, 2018).

International migrants, whose number has increased due to COVID-19, are especially susceptible to financial hardships as they compete for employment opportunities and public food aid with the host population (Ahmed et al., 2023). According to Chikanda et al. (2020), resettled African migrants experience higher levels of food insecurity and poorer diets than the host South African population.

This paper aims to document the extent to which national and international migrants experience food insecurity relative to the native population and provide an analysis of the main determinants underpinning any difference found among these groups. Access to food is such a fundamental condition supporting life that its study is wholly justified, though comparisons by immigration status are still under-researched.

Food insecurity refers to people's physical and financial incapability to access nutritious, safe, and sufficient food to fulfil their dietary requirements (Oduniyi & Tekana, 2020). The literature highlights that factors contributing to food insecurity include socio-economic characteristics such as income, gender, household size, and education (Oduniyi & Tekana, 2020). In the context of internal and international migration, food insecurity is found to be worse by a lack of financial means, poor language skills, socially or culturally specific dietary preferences, and an inadequate understanding of available options and services (Anderson et al., 2014; Carney & Krause, 2020) as well as limited social networks and support systems, environmental factors, and, at times, inadequate policy and governance (Sadiddin et al., 2019; Smith & Floro, 2020; Vahabi & Damba, 2013; Wood et al., 2021). It is unclear whether this applies *tout court* to migrants in South Africa, as some have been quite successful economically. The empirical analysis will shed light on this.

The constitutional mandate of food security in South Africa adheres to the African Union's 50-year strategy, Agenda 2063 and the Sustainable Development Goals, all of which strive to accelerate sustainable development. Food security challenges persist despite the numerous food policies implemented by the South African government to end hunger by 2030 (SDG Goal 2). These include the National Food Security and Nutritional Plan (NFSNP), the National Development Plan (NDP), and various constitutional mandates such as Section 27(1) b.

Despite this commitment, many native households in South Africa still rely on government grants, use multiple coping strategies such as skipping meals and spend most of their household income on food. In addition, some earn less than or equivalent to US\$1 per day. For instance, it has been estimated that in South Africa's prime industrial and economic area, Gauteng City Region,² one in every nine individuals has little to no access to food. This translates into a staggering 35% of the local population (Gauteng City-Region-Observatory Quality of Life (GCRO QoL) 2021/22; Oduniyi & Tekana, 2020). As Gauteng is also home to several internal and international migrants, it presents an ideal location on which to carry out the analysis. At present, policy intervention in Gauteng seem to

provide a blanket attention to food insecurity, as it lacks focus on the immigrant status of households. Carney and Krause (2020), Minkoff-Zern (2019), FAO (2019), Mazenda et al, (2022), and Carney (2015) all report that access to public assistance is often limited to native Gauteng residents, who prefer to access local government programmes targeting food security and indigency programmes.

This article identifies food security as a significant policy concern in Gauteng and thus aims to answer the following questions:

- Does migration status influence the food security status in Gauteng? Which population sub-group is most food-insecure?
- What are the underlying determinants, and hence possible areas for policy design, for improving the food security status of Gauteng residents?

The empirical analysis is based on the Gauteng City Region Observatory (GCRO) Quality of Life (QoL) – a public data set based on a household survey of adults (18+ years old) chosen randomly as respondents – which assesses the quality of life of the Gauteng City Region, its attitudes towards service delivery, socio-economic circumstances, value-based psycho-social attitudes, and other characteristics. The QoL data were collected in the region during 2020–2021 – at time of COVID-19. It is known that the pandemic has created significant new problems in issues such as food security, and it has deepened existing problems. In this context, the impact of COVID-19 may have been felt more keenly in a group with high vulnerability. The research however does not discuss the possible effects of COVID-19, nor it includes illegal international migrants. These limitations are acknowledged.

The analysis applies a linear probability regression model where the food security status is measured by the dichotomous answer to the question “In the past 12 month, did you or any of your family members skipped a meal?” (question q6_4 in QoL 2020/21). This is the only question related to access to food in QoL. Although it measures access to food only indirectly, a positive answer (i.e. “yes, we skipped a meal”) can be viewed as a proxy indicator for insufficient resources to afford daily meals, and hence a measure of food insecurity.

The migration status of the respondent is the explanatory variable of interest, as it enables to quantify the effect of being an international or native migrant on the probability of skipping a meal relative to a Gauteng City Region native. We find that migrants are far less likely to skip a meal relative to natives, especially if international migrants. The results call for targeted initiatives to help the food access of native Gauteng residents above all, and complement previous national and international studies that explore the determinants of the food security status of international migrants and refugees in South Africa and other developing and developed countries (see Atiglo et al., 2020; Carney & Krause, 2020; Crush & Battersby, 2013; Orjuela-Grimm et al., 2020).

Having introduced the study, the next section reviews the literature on migration and food security, followed by a discussion of the methodology, the results, and concluding remarks.

Literature review

Food insecurity is the lack of dependable access to an adequate supply of affordable, wholesome food (Mkhatshane, 2019). Sen's capability approach conceptualizes a holistic perception of capabilities, stipulating that the population must achieve specific abilities and should realize that the freedom to obtain a livelihood is absent if it forces one to sacrifice another critical aspect of livelihood (Miller & Thomas, 2020; Sen, 1993). This approach also highlights mechanical and individual challenges that can hinder capabilities, such as unemployment, race, health status, and household size (Miller & Thomas, 2020). Mkhatshane (2019) highlights that food security is continually evolving and is defined in different contexts globally.

Literature posits various determinants of urban food insecurity among migrant households. Urban food insecurity is linked to persistent political instability, racist stigma, and documentation precarity experienced by

immigrants (Salas et al., 2013). Documentation precarity and predisposing factors sometimes combine with food insecurity to perpetuate the recurrent patterns of ill health among displaced communities that rely on informal and unregulated jobs and have limited access to health care and social services (Carney & Krause, 2020; Carney, 2015).

Language barriers, culturally established dietary preferences that may not be satisfied in the new country, and unfamiliarity with nutritionally adequate substitutes are all factors related to food poverty among migrant and refugee groups. In addition, the lack of access to sustainable livelihoods, material resources, housing, and familiar social networks are also determinants of food insecurity among migrants (Orjuela-Grimm et al., 2020).

Around the world, most migrant households (rural-urban and international) earn low wages and live in perpetual poverty, exposing them to food insecurity. Worsening the food insecurity situation is their low or no rental income, lack of access to social support grants, and increased remittances (Pendleton et al., 2014; Tawodzera & Crush, 2017). Of prevalence are the high cost of fresh foods, lack of access to quality fresh produce, lack of preparation time due to work commitments, a lack of access to garden food production, including farming experience and access to the National School Feeding Scheme (Aboaba et al., 2020).

Other determinants of food insecurity among migrant households include housing stability, income level, food cost, temporary economic factors, and employment status. Owing to their effects on a household's individual and communal resilience resources, housing and income are widely acknowledged as the foundation of food security resilience (Renzaho & Mellor, 2010; Webb et al., 2006; Onyango et al., 2023; Wood et al., 2021). Housing instability can reduce familiarity with the local food environment, navigation of transport, and the development of community connections (Wood et al., 2021).

In the Gauteng City Region, previous research highlighted that the main determinants of urban food insecurity are unemployment, health status, education, household size, indigence, and income (Akinboade & Adeyefa, 2018; Mazenda et al., 2022), but such analysis did not focus on the respondents' migration status.

Overall, the literature suggests that migrants are likely to experience more factors with negative implications linked to food security unless they arrive with high wealth or there is an active intervention by deliberate programmes to enhance food security dimensions across culture, confidence, community, and capabilities. What is not clear is whether such programme interventions (either by the government or NGOs) require any differentiation between local and international migrant populations. This study aims to provide empirical evidence to help illuminate the necessity for such nuance.

METHODOLOGY

Data and sampling

As a sampling frame for the entire list of household heads, the study used primary data from the Gauteng City Region Observatory (GCRO) Quality of Life (QoL) collected in 2020 and 2021. The GCRO QoL (2020/21) is a public data set based on a household survey of adults (18+ years old) chosen randomly as respondents. All the respondents were interviewed in person at their residences.

The survey utilized a random sample of 6863 respondents from 529 Gauteng City Region wards (i.e. City of Ekurhuleni; City of Johannesburg Metropolitan Municipality; City of Tshwane Metropolitan Municipality; Emfuleni Local Municipality; Lesedi Local Municipality; Merafong Local Municipality; Midvaal Local Municipality; Mogale City Local Municipality). All data from the Quality-of-Life survey is freely available under a CC BY-SA 4.0 licence. Data can be accessed through UCT's Data First service or at the request of the GCRO. Gauteng City-Region Observatory (GCRO QoL) (2020/21).

The date of the research covers the period of the COVID-19 pandemic, which has created significant new problems with regard to food security. In this context, it is likely to assume that the impact of COVID-19 may have been felt more in a group with high vulnerability, such as migrants, than in more stable communities.

The results may therefore be influenced by such factors, though this study does not focus on the possible effects of COVID-19 on the sub-groups of interests. This limitation is acknowledged (Gauteng City-Region Observatory, 2023).

Sample means

Table 1 summarizes urban food security and its determinants among migrant households in the Gauteng City region. The occupants of most households were born in Gauteng (53.9%), followed by those born in other South African provinces (35.7%) and respondents born in another country (10.4%). About 50% of the respondents are female (mean index= 1.5).

A staggering 87% of households receive food support in many forms. Regarding their educational status, 32% of the households did not complete high school (matriculation), and only 2% did not have any education. About 80% of the households were African, with the other ethnicity group (13%) being white.

The average age of the household heads was between 40 and 44 (mean index= 5.9). Fifty-two per cent of the households received social grants from government or non-governmental organizations, and the average household income was R3700.00 monthly. The average household size was four members. About 75% of households are not covered by any form of medical aid or medical insurance and 65% of the households were satisfied with their health. About 80% of the households were African. Moreover, 66% of the households had access to electricity and the average time spend walking to the nearest public transport station was 0–10min, with 77% of the households experiencing the good public transport system, and expenditure of between 201 rands to 501 rands monthly on food.

Among the reasons for migrating, 16.3% of households migrated to be closer to family or friends (a partner/spouse, family members, friends, or people from their hometown/area), 13.3% migrated because housing options were better than where they were before, and 12.8% moved for work.

Empirical model

For the empirical analysis, this study builds on the methods of Atiglo et al. (2020). In their study, they utilize the Multinomial Logistic Regression model using data from the (nationally representative) Ghana Living Standards Survey (Round 7) to examine the food security status of migrants relative to their non-migrant counterparts in their rural origins across Ghana's three development zones (Coastal, Middle Belt, and Northern). This technique allows the comparison of a reference category with more than two other categories and estimates the choice probabilities for each of them.

As the dependent variable in QoL only contains two categories, we apply a Linear Probability Model (LPM) in the empirical analysis. This has the advantage of yielding coefficients that can be directly interpreted as “marginal effects” – namely the effect of a unitary increase of the independent variable (as a per cent change when the independent variable is measured in logarithms, a unitary increase from its average value when it is not measured in logarithms, and a change from “not” to “yes” when this is categorical as in from “not migrant” to “migrant”) on the observed probability on food insecurity. The baseline LPM is formalized as follows:

$$Y_i = \beta_0 + X_i\beta_1 + \beta_2 \sum_2 MIG_i + \varepsilon_i$$

where Y measures the food insecurity of respondent i (whether meals were skipped in the household over the past 12 months: yes= 1), X is a vector of individual and local characteristics such as age, gender, education, ethnicity, household size, labour force status, municipality, proximity to transport. MIG is the explanatory variable of interest – the

TABLE 1 Descriptive statistics.

Variable	Mean Index	Std. Dev	Min	Max	Frequency	%
Skip a meal in past 12 months	0.24	0.428	0	1		
Average probability						
Gender	1.5	0.004	1	2	6800	50
Male					6816	50
Female						
Place of birth	1.5	0.473	1	3	7338	53.9
Born in Gauteng					4866	35.7
Born in another province in South Africa					1412	10.4
Born in another country						
Food support	0.1	0.003	0	1	11,899	87.0
Yes					1717	13.0
No						
Education	3.7	0.009	1	6	265	2
No education =1					1362	10
Primary only =2					4288	32
Secondary - incomplete =3					4311	32
Matric =4					3388	25
Tertiary =5						
Age	5.9	0.025	1	11	5080	37
18–34					4313	32
35–49					2749	20
50–64					1474	11
65+						
Household size	3.7	0.02	1	24		
Social grant	0.46	0.498	0	1	7069	52
Yes =1					6547	48
No =2						
Medical aid	0.25	0.445	0	2	3356	24.6
Yes =1					10,206	75
No =2					54	0.4
Don't know =3						

TABLE 1 (Continued)

Variable	Mean Index	Std. Dev	Min	Max	Frequency	%
Transport expenditure (monthly)	4.8	0.466	1	7	1360	10
R0=1					870	7
R1 - R50=2					1934	14.3
R51 - R100=3					1678	12.5
R101 - R250=4					1875	13.9
R251 - R500=5					2378	17.2
R501 - R1000=6					1696	12.5
R1001 - R2000=7					657	4.8
Migration reason	5.8	2.719	1	11	515	3.8
Moved with my family when young					1809	13.3
Educational access					319	2.3
Better housing options					407	3.0
Safety					1551	11.4
Better amenities/services					1744	12.8
Work proximity					102	0.7
Employment					2226	16.3
Business start-up					281	2.1
Joining family					10,954	80
Nowhere to go					433	3
Ethnicity	1.5	0.009	1	5	417	3
African					1789	13
Coloured					23	0.02
Indian					4873	36
White					8743	64
Other						
Indigency	0.5					
Yes=1						
No=0						

(Continues)

TABLE 1 (Continued)

Variable	Mean Index	Std. Dev	Min	Max	Frequency	%
Public transport proximity	0-10 min = 1	2.719	1	11	10,485	77
	11-20 min = 2				2081	15
	21-30 min = 3				536	4
	31-40 min = 4				46	3
	40 min and above = 5				133	1
Electricity access	Yes = 1	0.47	1	2	9015	66.2
	No = 2				4601	33.8
Health satisfaction	Yes = 1	0.47	1	2	8662	65.1
	No = 2				4748	34.9

Source: GCRO QoL (2020/21).

migration status of the respondent. ϵ is the error term containing all unobserved characteristics affecting the respondent's food insecurity.

The main control variable of interest (MIG) is also categorical: the respondent's migration status in Gauteng City Region, and more precisely whether the respondent was born in Gauteng, born in another South African province, or born outside South Africa.

Other independent variables include known determinants of food security: education, household size, social grant, income, food support from government or NGO, not enough money to feed the children, satisfaction regarding food consumed, and school feeding scheme. All data are sourced from the GCRO QoL (2020/21) (Gauteng CityRegion Observatory, 2023).

To focus on the differences between natives and internal and international migrants. We modify the model to interact the variable *MIG* with each control variable, yielding in the functional form:

$$Y_i = a_0 + X_i \sum_2 \text{MIG}_i a_1 + \epsilon_i$$

which we estimate using LPM by Ordinary Least Squares. The coefficients of interest in the vector a_1 are obtained as the linear combination of the estimate of each underlying variable (e.g. gender) and its interaction with place of origin (e.g. internal migrant; international migrant).

Regression results

The results are presented in [Table 2](#). Each estimate is the linear combination of the coefficient obtained from the regression and the corresponding coefficient of its interaction with migrant status: for instance, the top left estimate in [Table 2](#) reports the effect recorded for a female internal migrant relative to a female Gauteng native. This estimate is the point estimate, and corresponding standard error, of the linear combination of the coefficients for the variables gender and gender \times internal migrant yielded by Stata's *lincom* command. A single star * means that relative to native Gauteng female respondents, internal migrant females are on average more/less likely (depending on whether the sign of the estimate is positive or negative) to have experienced food insecurity in the previous 12 months, and the estimate is statistically different from zero at the 10% level of statistical significance. As usual *p*-values lower than 5% and 1% are reported with ** and ***, respectively.

Before presenting the results on migration status, some preliminary results are worth noting. First of all, some explanatory variables have similar influences on the lower probability to experience food insecurity for internal and international migrants alike. Two such influences produce negative effects – that is they reduce the probability to skip a meal: these are age, which on average is higher among migrants than native Gauteng residents, and the level of education, which also tends to be higher, on average, among migrants. One influence instead is associated with an increase in the likelihood of experiencing food insecurity: carrying out a part-time job rather than working in full-time employment. Access to full-time work is actually the largest influence, and its coefficient ranging between 0.116 (internal migrants) and 0.137 (international migrants), suggests that switching from full-time to part-time employment raises the probability of food insecurity by 11.6%–13.7% relative to a native Gauteng resident. This large effect seems to underpin a more vulnerable employment among migrants or lack of access to local government support.

The estimates reported in [Table 2](#) also reveal that some factors not only distinguish internal and international migrants from natives but also among them. For instance, belonging to a mixed ethnic group is associated with higher probability of food insecurity but only for international migrants (+0.362). In contrast, ethnicity has no statistically significant effect for internal migrants relative to native residents. A similar result emerges for Indigency, where the coefficient for international migrants is positive and statistically significant at the 10% level. In contrast, higher expenditure for transport – possibly a sign of being relatively well off – has a slight negative effect (–1.3%).

TABLE 2 Baseline results, relative to native Gauteng resident.

Probability of skipping a meal	Born SA outside Gauteng	Born outside SA
Female	0.021 (0.016)	0.002 (0.032)
Ethnicity – Indian/Asian (ref: black)	0.053 (0.056)	-0.050 (0.078)
Ethnicity – White	-0.041 (0.038)	0.045 (0.057)
Ethnicity – Other, including mixed	-0.088 (0.068)	0.362* (0.197)
Education	-0.011*** (0.003)	-0.018*** (0.005)
Age	-0.010*** (0.004)	-0.012* (0.007)
Household size	0.00001 (0.0005)	-0.001 (0.009)
Health satisfaction	0.045*** (0.008)	0.022 (0.015)
Received government support	0.126*** (0.033)	0.030 (0.065)
Indigency	-0.016 (0.019)	0.066* (0.040)
Received medical aid	-0.045** (0.018)	-0.044 (0.035)
Interview duration (in min)	0.0001 (0.0003)	0.001 (0.001)
Household has any form of electricity	-0.033 (0.037)	-0.069 (0.051)
Works part-time (ref: works full-time)	0.116*** (0.023)	0.137** (0.036)
Expenditure for transport	-0.006 (0.005)	-0.013* (0.007)
Proximity to transport (in min)	0.005 (0.010)	-0.013 (0.021)
Constant	0.363*** (0.078)	
Adjusted R ²	0.1086	
N	5495	

Note: Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$; *** $p < 0.001$.

Factors influencing food insecurity only for internal but not for international migrants (relative to Gauteng natives) include health satisfaction, where being dissatisfied raises the probability of food insecurity by 4.5%, receiving government support in the form of food parcels (+12.6%), and medical aid (-4.5%). The statistical significance

of these estimates suggest that government support plays a key role in determining the well-being of internal migrants, but not the well-being of international migrants.

DISCUSSION

The article has explored the determinants of urban food security among migrant households in the Gauteng City Region, South Africa's economic powerhouse, at the receiving end of both national and international migration. As the dependent variable in QoL only contains two categories, we apply a Linear Probability Model (LPM) in the empirical analysis.

Some explanatory variables have similar influences on the lower probability to experience food insecurity for internal and international migrants alike. Two such influences produce negative effects – that is they reduce the probability to skip a meal: these are age, which on average is higher among migrants than native Gauteng residents, and the level of education, which also tends to be higher, on average, among migrants.

Age and level of education reduce the probability to skip a meal among internal and international migrant households alike. This is consistent with Mutisya et al. (2016) who found that an increase in education attainment increased chances of being food secure thereby reducing probabilities of skipping meals. Education is essential for the production, consumption, and accessibility of food. In addition, education is linked to improved employment prospects and gives households the know-how to take care of their family's nutritional and health needs. This suggests that better job prospects lead to higher disposable income, while educational factors such as resource allocation and household decision-making ultimately affect meal availability and household food security. (Mutisya et al., 2016). For age, reduction in skipping meals could be ascribed to the households' ability to adjust to culture and lifestyles while maintaining their usual meal consumption times a day (Lillekroken et al., 2024). The findings on age contrast with De Wet-Billings (2023) who highlighted that as the age increases, households become food insecure, and this increases the prevalence of meal skipping.

One influence instead is associated with an increase in the likelihood of experiencing food insecurity: carrying out a part-time job rather than working in full-time employment. Access to full-time work is actually the largest influence, and its coefficient ranging between 0.116 (internal migrants) and 0.137 (international migrants) suggests that switching from full-time to part-time employment raises the probability of food insecurity by 11.6%–13.7% relative to a native Gauteng resident. This large effect seems to underpin a more vulnerable employment among migrants or lack of access to local government support.

Part-time job increases the likelihood of experiencing food insecurity for both internal and international migrants. This could be ascribed to changes in lifestyles and work schedules which limit the availability of income to purchase food (Lillekroken et al., 2024). Mekonnen et al. (2022) also highlighted that migrants often work in low-productivity sectors with wages below what is required to meet the energy needs of the household and provide food security. In contrast, Esin et al. (2024) found that households working part-time had food security. However, de Sousa et al. (2019) highlighted that the association between employment and food security status is often predictable as this provides income.

The estimates reported in Table 2 also reveal that some factors not only distinguish internal and international migrants from natives but also among them. For instance, belonging to a African ethnic group is associated with higher probability of food insecurity not only for international migrants but also among internal migrants. This could be attributed to changes in food habits, meal preferences, and adoption of different foods and flavours as highlighted by Lillekroken et al. (2024). Mansour et al. (2021) postulated that language challenges contributed to food insecurity as it was difficult for migrants to secure employment and reduce poverty among their households.

In contrast, ethnicity has no statistically significant effect on food security for internal migrants relative to native residents. This could be because the migrants had a way of maintaining their culture and identity while eating and retaining their traditional food practices (Lillekroken et al., 2024).

A similar result emerges for Indigency, where the coefficient for international migrants is positive and statistically significant at the 10% level. Access to Indigency is associated with a higher probability of food insecurity among international migrants, and this concurs with Mazenda et al. (2022). This could be associated with resource constraints with first preference given to natives (Smith & Floro, 2020). Factors such as fear of deportation, lack of awareness about eligibility, and language barriers could also inhibit access to indigency (Sharareh et al., 2023).

In contrast, higher expenditure for transport – possibly a sign of being relatively well off – has a slight negative effect (–1.3%). High expenditure on transport and reflection that households are well off. This concurs with Valenzuela-Levi (2021) who highlighted that high incomes provided opportunities to spend more on transport. However, high energy prices may contribute to expenditure on transport by households as reported by Venter (2011).

Factors influencing food insecurity only for internal but not for international migrants (relative to Gauteng natives) include health satisfaction, where being dissatisfied raises the probability of food insecurity by 4.5%. This could be associated with one's ability to be either mobile, mortal, or able to conduct day-to-day activities, which often decline with age as functionality and physical health decrease, thereby affecting the acquisition of food for consumption as elaborated by Johannesson et al. (2021). A study by Khuri et al. (2022) reported that barriers in acquiring and maintaining a nutritious diet may arise for immigrants due to linguistic, logistical, and cultural differences, potentially resulting in suboptimal nutritional outcomes. Oldroyd et al. (2022) also highlighted that health disparities are impacted by food insecurity, as individuals experiencing food insecurity are more likely to suffer from heart disease, diabetes, anaemia, and poor mental health.

Receiving government support in the form of food parcels (+12.6%) is also associated with food insecurity for internal migrants. This aligns with Oldroyd et al. (2022), who suggested that food parcels often contribute to poor health due to their lack of nutritional adequacy. Food insecurity and ill health are cyclical. This is made worse because some food parcels may not be ideal for consumption for individuals with some medical conditions, and healthcare providers find it difficult to assist individuals who are food insecure (Oldroyd et al., 2022). Mansour et al. (2020) also associated receiving food parcels with food insecurity.

Having medical aid (4.5%) is negatively associated with food insecurity – a sign of affordability. This was in line with Himmelstein (2019), who demonstrated that medical aid significantly reduced severe food insecurity among low-income adults, suggesting that health insurance can alleviate financial burdens. These findings contrasted with Park et al. (2024) and Madden et al. (2020), who found that food-insecure adults were more likely to delay or forgo medical care due to cost, with medical aid beneficiaries being particularly vulnerable to food insecurity, emphasizing the need for targeted interventions to address these interconnected issues.

The statistical significance of these estimates suggests that government support plays a key role in determining the well-being of internal migrants but not the well-being of international migrants.

In comparing international migrants with native Gauteng households, the native Gauteng residents and internal migrants had a higher chance of skipping a meal than international migrants. Food insecurity is characterized by uncertainty and stress about access to food, followed by changes in dietary patterns as the situation worsens (Icheria et al., 2021). When the situation declines, food consumption decreases as portions are cut and meals are skipped, so a person may go an entire day or more without eating (Radimer, 2002). Amfo et al. (2021) highlighted that food shortages were more severe among non-migrants than migrants. As such, international migrants are more likely to adopt coping strategies that curb food expenditures than native Gauteng residents and internal migrants. Also, most migrants could have backyard gardens, knowing they do not have relatives to assist them with food needs. To reinforce these findings, Ngema et al. (2018) found that altered eating patterns/coping strategies, such as skipping meals, were prominent among native Gauteng households. These findings contradict the findings of Xu et al. (2023), who found that local Vietnamese migrants were more food insecure than international migrants. The differences are related more to the absolute quantity of food intake than the reduction in food quality or anxiety levels over food access. International migrants experienced three pathways to food insecurity: an income gap, an accessibility gap, and a benefits gap (Xu et al., 2023). Government policy should make it easier for

public authorities and civil society groups to include a nuanced understanding of migration needs in their development plans. This can be achieved by making internal transfers easier, encouraging international migrants to start their businesses, making it easier for migrants to integrate, and directing investment to rural areas. Business and economic stakeholders could be encouraged to channel investments to rural areas and less developed provinces. Local economic development is necessary to increase employment and also the income of internal migrants. This will reduce the rate of economic migration to populous economic regions such as Gauteng.

CONCLUSIONS

The study has explored the question as to whether there is a difference between the food security status of migrant households (international and internal) and native Gauteng households in South Africa. Gauteng is South Africa's economic powerhouse at the receiving end of internal and international migration. A Linear Probability Model (LPM) was used with the skipping of a meal as a proxy for food insecurity as the dependent variable against migration status and the determinants of food insecurity from the GCRO 2020/21 quality of life survey. Descriptive statistics show that most households' occupants in the survey were born in Gauteng, followed by those born in another province in South Africa (internal migrants), and about 10% were born in another country (international migrants). Almost all households in many forms have received food support. More than half of the households were food insecure and had received social grants from either the government or non-governmental organizations with an average household income less than that needed to meet the standard monthly consumer basket, in line with the consumer price index.

Findings reveal that some explanatory variables have similar influences on the lower probability of experiencing food insecurity for internal and international migrants alike. Two such influences produce negative effects – that is they reduce the probability of skipping a meal: age, which on average is higher among migrants than native Gauteng residents, and the level of education, which also tends to be higher, on average, among migrants.

Access to Indigency is associated with a higher probability of food insecurity among international migrants. More so, receiving government support in the form of food parcels is also associated with being food insecure for internal migrants.

Part-time jobs increase the likelihood of experiencing food insecurity for both internal and international migrants. Expanding employment opportunities for migrants can be mutually beneficial for both the migrants and the host country's economy. Establishing platforms to align migrants' skills with labour market needs can facilitate job placements in sectors where their expertise is most sought after. Furthermore, offering support through grants, loans, and financial guidance to migrant entrepreneurs can help them establish and expand their own businesses. Additionally, developing tailored initiatives for industries with high potential for migrant employment, such as health care, technology, and agriculture, will ensure that migrants have the necessary skills and opportunities in these fields.

Factors influencing food insecurity only for internal but not for international migrants (relative to Gauteng natives) include health satisfaction, where being dissatisfied raises the probability of food insecurity. Government support plays a key role in determining the well-being of internal migrants, but not the well-being of international migrants.

Health and social insurance coverage for both internal and international migrants should be increased to proactively react to income loss or job loss due to unforeseeable hazards. Access to health care should be non-discriminatory. Furthermore, efforts should be made to improve the rural health infrastructure and provide inexpensive benefits to healthcare workers to compete with the private sector. Regulation of the private sector is also required to minimize the consequences of increased inequities in healthcare access.

Migration should be rigorously managed to avoid possible migration boom challenges that overburden local service delivery. The South African government should establish policies financially aiding rural and underprivileged

communities. Policies to promote agriculture, farmers, and rural areas, particularly developing new rural housing schemes, should be explored and executed. Revitalization of the existing Special economic zones (SEZ) can help limit the concentration of both local and international migrants in Gauteng. Coega and East London SEZ can reduce unemployment, socio-economic development, and the movement of the local population to Gauteng.

The study is not without limitations; it does not capture the food security status of undocumented migrants in the Gauteng City region. Future studies must consider sampling undocumented migrants in Gauteng informal settlements.

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CONFLICT OF INTEREST STATEMENT

The authors declare non-conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in Gauteng City-Region Observatory at <https://doi.org/10.25828/wemz-vf31>.

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Endnotes

¹This study adopts the following definitions for international and internal migration. **International migration** refers to the movement of people across national borders to settle in a new country. This movement can be temporary or permanent and can occur for various reasons, including economic opportunities, family reunification, education, asylum seeking, or fleeing conflict or persecution (International Organisation for Migration (IOM), 2015).

Internal migration refers to the movement of people within a state, involving establishing a new temporary or permanent residence. Internal migration movements can be temporary or permanent and include those displaced from their habitual residence, such as internally displaced persons, as well as persons who decide to move to a new place, such as in rural-urban migration. The term also covers nationals and non-nationals moving within a State, provided the migrants move away from their habitual residence (IOM, 2015).

²The Gauteng City Region is an integrated cluster of cities, towns and urban nodes that together make up the economic heartland of South Africa. Statistics South Africa's July 2022 mid-year population estimate puts the current population of Gauteng at 16,098,571. Gauteng, the smallest yet most densely populated province in South Africa, boasts three metropolitan municipalities. Johannesburg is the financial capital of South Africa. Pretoria, the administrative capital, and Ekurhuleni, a mining, residential, and man-made attractions hub. The city region also houses local municipalities: Emfuleni, Lesedi, Merafong Municipality, Midvaal, and Mogale. In addition, there are the commercial, industrial and mining centres such as Germiston, Springs, Alberton, Boksburg, Benoni, Vereeniging, Vanderbijlpark, Krugersdorp, Randfontein, and Westonaria (Gauteng City Region Observatory(GCRO), 2023).

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