National Food and Nutrition Security Survey

FREE STATE PROVINCE REPORT

FOOD AND NUTRITION SECURITY

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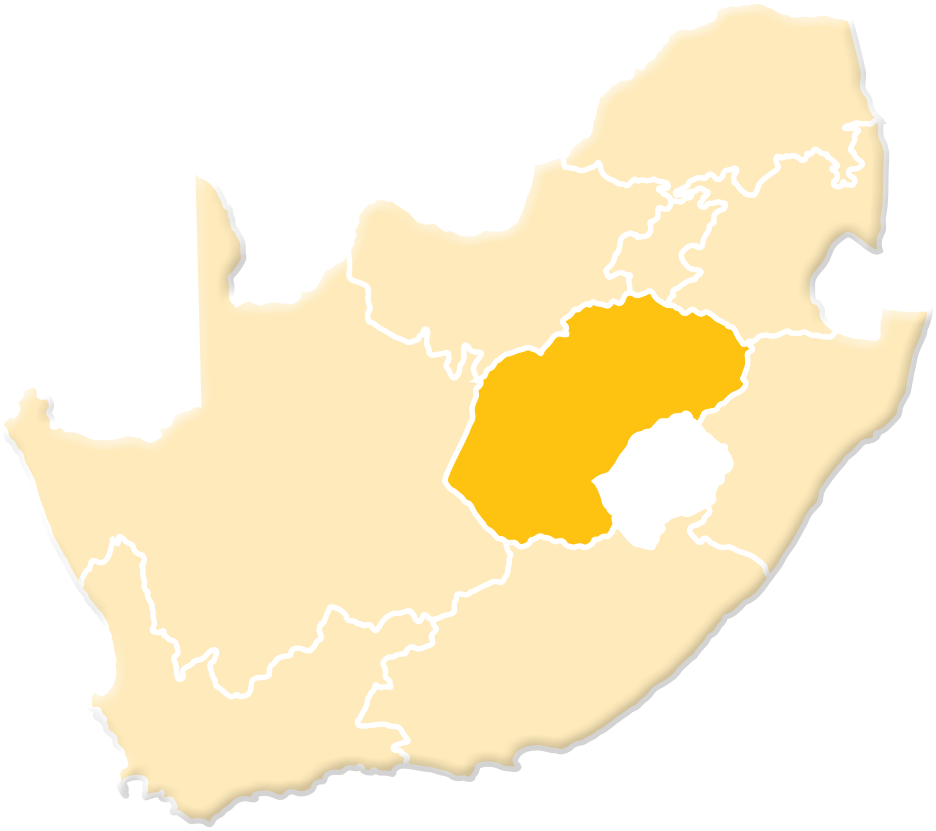
List of Abbreviations

BMI	Body Mass Index
CAPI	Computer Assisted Personal Interviewing
CI	Confidence Interval
CSI	Coping Strategy Index
GBV	Gender-Based Violence
GDP	Gross Domestic Product
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Land Reform and Rural Development
DDS	Dietary Diversity Score
DOH	Department of Health
DSD	Department of Social Development
FCS	Food Consumption Score
FGDs	Focus Group Discussions
FNS	Food and Nutrition Security
GAM	Global Acute Malnutrition
GHS	General Household Survey
HDDS	Household Dietary Diversity Score
HEA	Household Economy Approach
HFIAP	Household Food Insecurity Access Prevalence
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
HSRC	Human Sciences Research Council
IFSNP	Integrated Food Security and Nutrition Programme
JMP	Joint Monitoring Programme
Kg/Ha	Kilogram Per Hectare
LHZ	Livelihood Zones
LimVAC	Limpopo Vulnerability Assessment Committee
MAHFP	Months of Adequate Household Food Provisioning
NFERP	National Food Emergency Relief Programme
NFNSS	National Food and Nutrition Security Survey
NIDS	National Income Dynamic Survey
NISIS	Nation Integrated Social Information System
RDP	Reconstruction and Development Programme

RVAA	Regional Vulnerability Assessment and Analysis
SADC	Southern African Development Community
SAL	Small Area Layers
SAS	Statistical Analyses Systems
SALDRU	Southern Africa Labour Development Research Unit
SANHANES	South African National Health and Nutrition Examination Survey
SAVAC	South Africa Vulnerability Assessment Committee
SOP	Standard Operation Procedure
Stats SA	Statistics South Africa
TLU	Tropical Livestock Units
UNICEF	United Nations International Children's Emergency Fund
VIP	Ventilated Improved Pit
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organization
WHR	Waist-to-Hip Ratio
ZAOCG	Highveld Border Open Mixed Income Livelihood Zone
ZANWC	Western Open Access Cattle and Game Farming Livelihood Zone
ZAHMI	Highveld Open Access Mixed Income (ZAHMI) Livelihood Zone



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Disclaimer

This report is based on the empirical evidence collected from selected Small Area Layers (SALs) within the five districts of Free State Province. SAL is the smallest geographical unit usually allocated to a single enumerator during census enumeration. In other words, it constitutes a small piece of land for an enumerator to cover to administer a questionnaire during a census or study (Statistics South Africa). Each of the SALs in this survey had 35 visiting points (households). The results provide a baseline assessment of the status quo of food and nutrition security in the province. The data was collected during COVID-19 lockdown around January-February 2022. This greatly influenced and changed the picture from what would ordinarily obtain under a normal situation. The project benefited from the valuable insights and input of the advisory board that provided comments and reviewed the research reports. Albeit they cannot be held accountable for errors or omissions that may exist in the report. Whilst this research project has benefited from the valuable insights and input of a Technical Advisory Group (TAG) that provided comments and reviewed the final research report, the ultimate responsibility for the contents therein (including but not limited to unintentional errors, inaccuracies, or omissions) rests with the authors and researchers involved. Users of this research should exercise their judgment and discretion when interpreting the findings and recommendations presented herein.

Executive Summary

Food and nutrition security is one of the fundamental strategic imperatives of the government of South Africa. The right to access sufficient food is firmly entrenched in the Constitution of the Republic of South Africa (Sections 27, 28, and 35). Many policies, programmes, and intervention measures, such as social grant systems (which include child support, school feeding schemes, and farmer support programmes) have been developed and implemented to help improve the food and nutrition security situation at household level in the country. These programmes are reflected in the National Policy on Food and Nutrition Security in 2014 and, subsequently, the National Food and Nutrition Security Policy Implementation Plan (2018-2023). Despite these efforts, food insecurity is still a reality and a major concern for several million people in South Africa. Strong evidence exists that there are households in South Africa that go to bed on empty stomachs, and others that only eat once or twice a day. In addition, South Africa is reported to be going through a nutrition transition characterised by the double burden of malnutrition (manifesting through stunting and wasting) and overweight due to the consumption of a nutrient-poor diet. This is in sharp contrast to the fact that South Africa is food secure at a national level. The concentration and distribution of these households across the various districts within the province need to be established as this has been a cause for concern for the Department of Agriculture, Land Reform, and Rural Development (DALRRD) as well as the membership of the South African Vulnerability Assessment Committee (SAVAC) which is comprised of various sectors.

To develop intervention measures that are well-targeted and address the root causes of household food and nutrition insecurity, current data at lower geographic levels and contextually relevant scientific evidence are crucial. Accordingly, the DALRRD commissioned a National Food and Nutrition Security Survey (NFNSS) aimed at providing baseline data on the state of food and nutrition security across districts and livelihood zones in South Africa. Further, the survey sought to investigate the link between food security and nutrition as well as assess the impacts of COVID-19 on household FNS. National surveys on food and nutrition security are needed as they inform the government and policymakers about the actual status of food and nutrition insecurity in a country.

This provincial report provides the first-ever full-scale baseline assessment of the Food and Nutrition Security Survey (NFNSS) conducted in all five districts of the Free State Province. The survey adopted the SAVAC-endorsed methodological framework for measuring food insecurity and assessing vulnerability. The framework combines qualitative and quantitative research dimensions to enhance methodological and data triangulation. Broadly, the framework adopts the food and nutrition security continuum, and the Household Economy Approach (HEA). Out of the targeted 4457 visiting points (VPs), 94.7% were valid. Out of these valid VPs, 65.5% were realised. A total of 2 916 people were interviewed in this province; when weighted, this total represents 1 920 872 South Africans 18 years and older living in the Free State Province.

Several internationally accepted food security indicators, such as the Household Food Insecurity Access Score (HFIAS), Household Hunger Score (HHS), Food Consumption Score (FCS), and Household Dietary Diversity Score (DDS), were used to capture the different dimensions of food and nutrition security. The results indicated that many households were food insecure in the Free State Province. The HFIAS revealed that about a third (31.6%) of households were food secure, with the remaining 68.4% of households being food insecure. Of those who are food insecure, 21.6% of the households experienced severe levels of food insecurity. The HHS showed that over 70% of households experienced little to no hunger, while 19.1% and 7.2% of households experienced moderate hunger and severe hunger, respectively. The FCS and HDDS showed that over 37% and 68% of households, respectively, consumed an acceptable number of food groups across all the districts. The FCS indicated that 24.9% of households consumed poor diets, while 37.3% consumed borderline diets. However,

households mostly consumed nutrient- poor food groups such as cereals, condiments, sugars, and oils/fats; there was limited consumption of nutrient-rich food groups such as fruits, pulses, nuts, eggs, fish, and seafood.

The levels of food insecurity varied across districts. Severe food insecurity was more prevalent in the Lejweleputswa District, where 25% of the households were severely food insecure, and 9% experienced severe hunger, as determined by HFIAS and HHS, respectively. Additionally, households from Lejweleputswa had a poor diet and the lowest dietary diversity, with 29% and 6% of the households found to have consumed poor diets and low dietary diversity, respectively. This was followed by Thabo Mofutsanyane, Fezile Dabi, and Xhariep districts respectively. Mangaung District had the lowest proportion of households experiencing severe food insecurity, at 18% respectively. Severe food insecurity was more prevalent among households headed by younger household heads, and among households from the Fezile Dabi, Thabo Mofutsanyane, and Xhariep districts.

Significant relationships were found between household food security status and some demographic and socio-economic factors such as gender, age of household head/ acting head, access to irrigation, water source, sanitation, social grants, household size, markets, education level of household head/ acting head, and involvement in agricultural production. Overall, the results showed that social grants, education levels, and employment were positively correlated with better food security outcomes. As an example, the proportion of food-secure households increased significantly as education levels also increased; only 26.3% of households headed by people with no education were food-secure compared to 66.5% of households headed by people with tertiary qualifications. Farming activities played a significant role, suggesting that dealing with food insecurity in a province such as the Free State is dependent on agricultural activities as well as the expansion of social protection measures (such as social grants) and creating of employment opportunities.

Findings indicate that 84.8% of children under 2 years were breastfed at some point in their lives. The provincial prevalence of overall stunting, wasting, and underweight in children aged 0-5 years is 30.5%, 4.7%, and 10.8%, respectively, compared to 34.7%, 2.1% and 5.1% in 2012. This indicates that the proportion of children experiencing acute undernutrition has increased, while the prevalence of chronic undernutrition has reduced over the past 10 years. Over the same time period, the combined prevalence of overweight and obesity in adult females has increased from 63.7% to 68.2%, while that of adult males have decreased slightly from 25.3% to 23.8%. Across the districts, Lejweleputswa has the highest prevalence of severe stunting (14.2%), while Manguang has the highest prevalence of severe wasting (3.7%), and Fezile Dabi has the highest prevalence of severe underweight (9.1%). The nutrition indicators for children were generally not correlated with the food security status of households, suggesting that these nutrition challenges similarly affected members of both food-secure and insecure households. However, there were significant correlations between food security and nutrition indicators for adults. Table A shows the summary of the food security and nutrition indicators.

The survey also showed that the COVID-19 pandemic, and the lockdown measures introduced to curb its spread, led to serious disruptions in food supply chains and production systems. The increase in food prices was the biggest shock experienced across all five districts in the Free State Province. The highest shocks were experienced in Fezile Dabi, Lejweleputswa, and Thabo Mofutsanyane districts, with 75%, 71%, and 54%, respectively. Mangaung District had the highest percentage (39.4%) of households who were sometimes worried about their food running out before they can get money to buy some more food. Lejweleputswa and Thabo Mofutsanyane districts also had the highest percentage (25.5%) of households who reported that their food often ran out and they did not have money to buy more.

Several recommendations have been proposed, and these revolve around strategies to:

- increase incomes of households,
- create employment,
- ensure water security to adapt to the changing climate,
- enhance food safety,
- invest in post-harvest agro-processing and intrinsic land access,

- establish food banks,
- promote domestic food production,
- improve awareness of micro- and macro-nutrient consumption interventions, and
- implement full-scale nutrition-sensitive programmes.

Table A: Free State Food and Nutrition Security situation based on selected indicators

DISTRICTS	FOOD SECURITY INDICATORS (%)											
	Household Food Insecurity Access Scale (HFIAS)			Household Hunger Scale (HHS)			Household Dietary Diversity Score (HDDS)			Food Consumption Score (FCS)		
	Food Secure	Mild/ Moderate	Severe	Little/No	Moderate	Severe	Highest	Medium	Lowest	Acceptable	Borderline	Poor
Fezile Dabi	28.0	51.0	21.0	75.0	19.0	6.0	75.0	19.0	6.0	30.0	53.0	17.0
Lejweleputswa	22.0	50.0	25.0	72.0	19.0	9.0	69.0	25.0	6.0	29.0	23.0	29.0
Mangaung	38.0	44.0	18.0	77.0	17.0	6.0	66.0	24.0	10.0	53.0	42.0	24.0
Thabo Mofutsanyane	32.0	45.0	23.0	70.0	22.0	8.0	65.0	23.0	12.0	48.0	25.0	28.0
Xhariep	41.0	38.0	21.0	75.0	17.0	8.0	68.0	24.0	8.0	ND	ND	ND
Province	31.6	46.8	21.6	73.7	19.1	7.2	68.2	22.0	8.7	37.3	37.3	24.9

DISTRICTS	NUTRITION INDICATORS (%)											
	STUNTING			WASTING			UNDERWEIGHT			ADULT BMI		
	All	Moderate	Severe	All	Moderate	Severe	All	Moderate	Severe	Underweight	Overweight	Obese
Fezile Dabi	24.2	11.8	12.4	3.4	1.3	2.1	10.4	1.3	9.1	9.1	24.8	28.8
Lejweleputswa	37.0	22.8	14.2	7.7	5.3	2.4	15.0	11.7	3.3	13.5	20.0	27.1
Mangaung	30.2	21.1	9.0	6.2	2.4	3.7	9.1	6.5	2.6	13.9	23.6	28.9
Thabo Mofutsanyane	27.3	15.4	11.9	1.7	1.7	0.0	8.5	6.2	2.4	8.2	21.8	35.7
Xhariep	43.2	35.4	7.9	0.5	0.5	0.0	2.7	0.0	2.7	10.9	14.8	29.1
Province	30.5	18.5	12.0	4.7	2.8	1.9	10.8	6.7	4.1	11.3	22.2	30.1

Legend

Food Secure,			0.0 - 9.9%
Little/ No Hunger,	Severe/	Mild/	10.0 -19.9%
Highest,	Poor	Moderate/	20.0 -29.9%
Acceptable		Borderline	30.0 -39.9%
			40.0 -49.9%
			50.0% +

1 Introduction

Food security is achieved when all members of a household consume adequate food to meet their individual dietary needs on a continual basis (FAO, 1996), is one of the strategic imperatives for South Africa. This is expressed in the Constitution of the Republic, many governments' policy documents and development plans (e.g., the national development plan). The right to have access to sufficient food by all citizens is enshrined in the Constitution of the country. To translate this right into action, Government approved the National Policy on Food and Nutrition Security in 2014. Since then, the National Food Security plan has been developed but not fully implemented. However, despite the solid legislative, constitutional and policy framework for food and nutrition security imperatives, a significant proportion of South Africa's population faces massive food and nutrition challenges. These include hunger, micronutrient deficiencies, stunting, wasting and obesity. While there is sufficient food to feed everyone in South Africa through domestic food production and food imports many families and individuals go to bed hungry (Stats SA, 2019). Recent estimates are that the number of individuals with inadequate or severely inadequate access to food rose from 13.7 million in 2020 to 14.4 million in 2021 (Stats SA, 2021).

Food security is a multi-dimensional concept[1], which needs to be addressed within the context of various issues in South Africa, which include land reform, employment, agricultural productivity, adequate responses to hazards and shocks, as well as the economic lens. This requires planning that is adequate, efficient, and effective in addressing the country's vulnerability to food insecurity. Such planning needs to be supported by up-to-date data at lower geographic levels and scientific evidence that is contextual and relevant to the realities facing various communities and households in the country. Large-scale surveys, such as the NFNSS, can generate such data and evidence, that is representative at the district levels. The NFNSS survey intends to address the following objectives:

1. To provide a baseline assessment of the food and nutrition security situation at household level in the respective livelihood zones in Free State Province, in terms of:
    a. Availability: to determine food availability at household level.
    b. Access: to determine food access at household level.
    c. Food utilisation: to determine individual food consumption within the household and compile anthropometric measurements.
    d. Food stabilisation: to assess household food stability with respect to the food supply, price changes, shocks, and the coping mechanisms.
2. To analyse the link between food security and nutrition and explore reasons for people's vulnerability.
3. To assess the impact of COVID-19 on food security and nutrition at household level in South Africa.
4. To make recommendations for planning and targeting interventions for food and nutrition security.

1 The four dimensions of food security that are commonly identified are food availability, food access, food utilisation, and stability. These dimensions are hierarchical, with availability necessary but not sufficient to ensure access, while access is, in turn, necessary but not sufficient for effective utilisation (Barrett, 2010).

2 Background

The state of food and nutrition vulnerability in South Africa has been exacerbated by both the economic hardships, which are a result of the high rate of unemployment, and the outbreak of COVID-19 with the associated control measures implemented by the government to contain its spread. As an intervention, the Department of Agriculture Land Reform and Rural Development (DALRRD) has in the past developed and implemented various programmes that are intended to cushion communities from the vulnerability and devastating effects of hunger and poverty. There is, therefore, a need to systematically determine if these government programmes and interventions are having the desired impact of protecting households from exposure to food insecurity. To do this, the DALRRD commissioned a nationwide food security and nutrition survey. The survey sought to develop a deeper understanding of the state of food security and hunger at household level. Its ultimate objective was to develop targeted programmes and intervention measures that address prevalent problems and is, therefore, likely to yield impactful results.

The DALRRD provides the secretariat for, and chairs, the South African Vulnerability Assessment Committee (SAVAC). The committee exists as a multi-stakeholder forum for organising the development and maintenance of a well-coordinated information system for classifying, measuring, monitoring, and forecasting food insecurity and vulnerability levels in the country. Not long ago, SAVAC began a process of conducting baseline assessments to determine the *status quo* of livelihoods, food, and nutrition security in localised geographical areas for informed planning and targeting of interventions. The initial baseline assessments were conducted in 19 of the 119 Livelihood Zones of South Africa (Ngidi et al., 2016). However, for the information system to be fully functional, there was a realisation of the need to undertake a national baseline against which the national vulnerability forecasts and monitoring surveys can be conducted.

In this regard, SAVAC endorsed the need for a national food, nutrition, and security assessment that would enable the country to have a complete baseline data set of open access, exclusive access zones, and urban areas to provide a complete picture of the food and nutrition security situation at municipal, district, and provincial levels. Such a national baseline is meant to guide planning, including the design of intervention strategies for the National Food and Nutrition Security Plan (NFNSP).

The national report will provide the first ever full-scale baseline assessment of the National Food and Nutrition Security Survey (NFNSS) conducted in all the districts across the nine provinces of South Africa. This report contains the results from the Free State Province only. The survey sought to provide the first step towards the development of a multi-dimensional index to assess countries' vulnerability to food insecurity across four food security dimensions. It supplements the South Africa Demographic and Health Survey (SADHS) by updating the provincial level data it presented. General Household Surveys (GHS) is that GHS has been covering approximately 32 000 households annually since 2002, and it does not include nutrition indicators. It only focuses on the experience of hunger and access to food only. In most countries, food and nutritional security assessments provide estimates which are representative at administrative levels (such as province, districts, and sub-district) by rural/ urban divide or for both rural and urban as defined by the livelihood zones.

3 Methodological Matrix

The survey adopted the SAVAC endorsed methodological framework for measuring food insecurity and vulnerability. The framework combines qualitative and quantitative research dimensions to enhance methodological and data triangulation. Broadly, the framework adopts the food security continuum and the Household Economy Approach (HEA).

3.1 Food Security Continuum

The food security continuum builds on the iterative understanding of food insecurity as a phenomenon. It brings convergence to the economic, social, environmental, and political aspects of food insecurity and, by focusing on individual experience, it considers the right to food. Figure 1 provides an overview of the food security continuum.

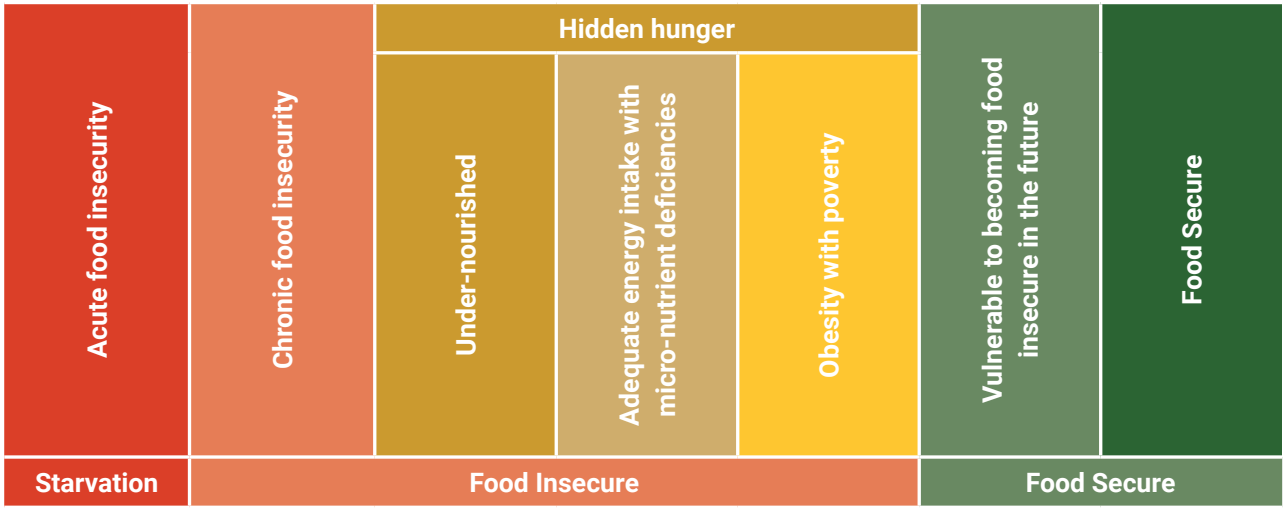


Figure 1: *Food Security Continuum (Hendriks, 2016)*

A set of indicators to monitor food security and nutrition were considered, including HFIAS, HHS, DDS and anthropometric measurements to determine the number of households that are food insecure and using various categorisations in the Food Security Continuum.

3.2 Indicators of Food and Nutrition Security Measurement

The household food and nutrition security (FNS) levels were measured using different indicators. The multi-dimensional nature of FNS makes it difficult to adequately capture all its dimensions using only one indicator. There is currently no perfect single indicator of FNS and, instead, several complementary indicators - each focusing on one or more of the four dimensions of FNS (i.e., availability, access, utilization or nutrition, and stability) - exist (Hendriks et al., 2016). The food availability dimension refers to the availability of sufficient quantities of food of appropriate quality supplied through domestic production, imports or donations. This report focuses on food production activities. Food access is about households or individuals having adequate resources to acquire, in a socially acceptable manner, appropriate foods for a nutritious diet. The food utilisation pillar relates to the ability of households to select, store, prepare, distribute, and eat food in ways that ensure adequate nutritional absorption for all members of a household. This dimension, therefore, focuses on how households use the food through adequate diets, clean water, sanitation, and health care to

reach a state of nutritional well-being where all members' physiological needs are met. The food stability pillar points to the fact that to be food secure, a population, household, or individual must have access to adequate food at all times. They should not risk losing access to food due to sudden shocks (e.g., an economic or climatic crisis) or cyclical events. Studies that have investigated the correlations among the different FNS indicators in South Africa and internationally have found that correlations among different FNS indicators vary from relatively weak across FNS dimensions (those are comparing indicators of the different FNS dimensions), to relatively strong within FNS dimensions (comparing indicators of the same dimension). It is, thus, important that a suite of FNS indicators be reported to adequately monitor the different dimensions of FNS. In acknowledging that there is no single perfect agreed global measure that captures all aspects of food insecurity, the framework proposed the use of standard and acceptable food and nutrition measurement indicators. Through the food security continuum, an array of indicator tools was used, and these were complemented with the HEA as indicated in Table 1.

Table 1: Tools that were used for both quantitative and qualitative methods

	Baseline Assessment Indicators	Tools	Instrument: Section	
Food Security Continuum	Availability	• Production • Post-Harvest	6	Household Economic Approach
	Access	• Hunger Scale (12months) • Hunger Scale (4Weeks) • HFIAS	7 A, B, C, D 9	
	Stability	• Food expenditure • Key Informant Interviews • Shocks	8, 11, 12	
	Utilisation	• HDD • Anthropometry Measurements	Individual Nutrition Questionnaire	

**HEA: 1) Food Security Livelihood Zoning 2) Wealth Breakdowns 3) Livelihood Strategies 4) Problem Specification 5) Analysis of Coping Strategies 6) Projected Outcomes.

3.3 Household Economy Approach (HEA)

The second approach has been the livelihoods-based vulnerability assessment system referred to as the Household Economy Approach (HEA), commonly used in many Southern African Developing Community (SADC) countries. This approach provides an understanding of how people make a living (livelihood systems), a forecast analysis for food security and livelihood outcomes in the context of a dynamic environment, is necessary for planning and targeting of interventions. Data captured in this approach is based on the use of rapid appraisal methods and semi-structured interviews to determine wealth breakdown and livelihood strategies in different areas. This is a qualitative dimension of the food security and nutrition assessment in which key informant interviews and focus group discussions were used in different livelihood zones.

4 Survey Design and Sampling

4.1 Study Design and Sampling for the Household Survey

The study design was cross-sectional and sought to provide representative and precise information at the household level. The first stage of the two-stage cluster sampling design is the selection of SALs or clusters in each district using PPS (Probability Proportional to Size). In this province, we selected a total of 137 SALs. The second stage was a simple random selection of households within each selected SAL/Cluster, and for this study, we selected 35 households per SAL. Then in each household, we selected an average of 3 persons (household head, mother/ caregiver, and child under 5 years old).

As for the HEA, qualitative information was gathered in the form of focus group discussions and key informant interviews in the selected open-access livelihood zones of Free State Province. A livelihood zone is an area within which people broadly share the same pattern of livelihood, including options for obtaining food and income and market opportunities.

4.2 Determination of the Geographical Area (strata) for Household Sample Design

Often food security and nutrition indicators per geographical area e.g., district, is used as a basis for drawing the sample for the study. However, food and nutrition insecurity may vary across the country, given the heterogeneity across the livelihood zones (LHZ)

Administratively, Free State Province is divided into 4 districts, and 18 local municipalities (mixed urban and rural). In this study, the smallest geographic unit is the small area layer (SAL) composed of 35 households sampled. Given the heterogeneity in livelihoods within regions, the province has 3 Open Access Livelihood Zones that have people living in them. The LHZ strata can cover several districts or cross over several provinces. This means a district will not necessarily have all the livelihood zones. A GIS function was used to overlay the administrative boundaries with the livelihood zones (as illustrated in Figure 2).

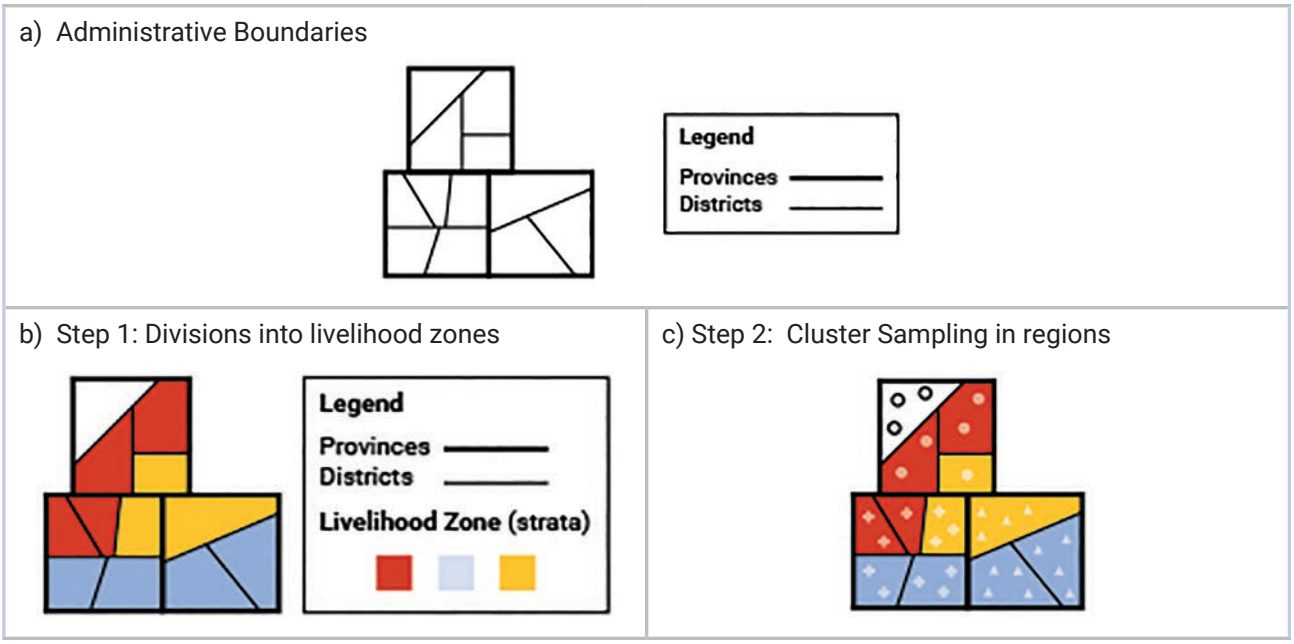


Figure 2: *Schematic representation of the overlay of administrative boundaries and LHZ*

Stratification by administrative boundary and livelihood zones serves two functions:

i. First, administrative boundaries rarely correspond with household characteristics related to food insecurity, and thus estimates for administrative aggregations are likely to mask meaningful differences between sub-groups.

ii. Second, defining sub-groups for stratification using criteria related to vulnerability or food insecurity improves the precision of both sub-group and overall food security estimates.

For district level estimates, the strata of investigation are the 3 districts, with clusters/ SALs distributed across livelihood zones within districts. In this study, given the resource and time constraints, the focus was on the district strata.

4.3 Eligibility

4.3.1 Participant inclusion criteria

- Randomly selected households within the defined geographic area of survey coverage.
- All children under 5 years of age at the time of data collection who live in selected households are eligible for the survey, on condition that their parent or caregiver gave consent for participation. Parents or caregivers provided individual dietary information related to the child, and children participated in anthropometry measurements.
- Mothers/ primary caregivers of the children in the household were eligible if they were included in the survey sample and gave consent for data collection.

4.3.2 Participant exclusion criteria

- Households not currently living in the defined geographic area, or consent for participation was denied by the adult household member approached by the survey team.
- Individuals in selected households are ineligible if consent for individual participation is denied.
- Children were ineligible for anthropometric measurement if they had a disability, which prevents accurate weight or height measurements from being taken.
- Children above 5 years of age.
- Adults who are not the head of the household or those who are not responsible for food preparation or not the primary caregiver / biological mother of the children aged under 5 years.

4.4 Sample Size Estimation

The sample size estimate was aimed at informing the surveillance purpose of tracking important changes in the food and nutritional security in South Africa over time; that is, between rounds of food and nutritional security. In addition, this sample was not meant to produce precise estimates for malnutrition prevalence at district level. The primary goal of collecting the nutrition data and/or anthropometric measures data was to assess the levels of food security and nutrition, and analyse the link between food security and nutrition. The sample design was based on the estimated prevalence of food security outcome indicators described in Section 3.2. This was deemed sufficient to calculate the minimum sample size that allows the link between children nutritional status and household level of food security.

In order to enhance precision in the estimation of the main outcome indicators, the Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology was adopted. Essentially the sample size considered both nutrition and food security indicators through a stepwise process.

Two different samples, based on both food and nutritional security indicators, using the following criterion:

- If there was a small difference in the nutrition sample size and food security derived sample sizes, the higher sample size was taken, and both food security and nutrition indicators were assessed in all sampled households.

To ensure that the appropriate sample size was covered, extra clusters per strata were added to substitute inaccessible areas, insecurity, or rejection of some original clusters. Likewise, households within each cluster were reserved to compensate for non-response or refusal. The inaccessible areas were replaced by the cluster with the same characteristics. This approach was adopted to ensure unbiased selection and to maintain the precision of the study outcomes.

4.4.1 Determining sample size for the food security survey

The sample size calculation sought to provide statistically representative and precise information on food security at the district level. The required sample size for each stratum (district) was determined using the formula presented below and food security indicators provided in Table 2 and recommended parameters listed in Appendix 5. Due to many different indicators that could be used to measure food security, a proportion of 50% to get the largest sample desired for analysis of multiple indicators of food security at district level was considered.

$$n = \frac{Z^2\, p(1-p)}{E^{2*}\, Deff}$$

- 95% degree of confidence (Z Score=1.96);
- P is the prevalence of food insecurity measures for each province; if missing, we assume a P of 50%, which will yield the required sample size which is desired for the analysis of multiple indicators of food security at varying prevalence (p);
- Deff: A design effect 1.5 to adequately address effects of intra-cluster correlation;
- 7-10% minimum desired precision (MOE) or maximum tolerable error (from other studies in sub-Saharan Africa and budgetary constraints on sample size)
- 80% statistical power;
- Household response rate (SANHANES) 2013- varies across provinces.

Table 2: Food Security Indicators

Parameters for food security	Value	Value	Value
Estimated Prevalence of food insecurity (%)	50%	50%	50%
± Desired precision	5%	6.5%	7%
Design Effect (*if applicable*)	1.5	1.5	1.5
% Non-response Households	15%	15%	15%
% Confidence interval	95%	95%	95%
% Power	80%	80%	80%
Households per district (strata)	**678**	**401**	**346**
TOTAL SAMPLE	**35 256**	**20 852**	**17992**

A sample of 401 households per stratum (district) provides the required estimate of food insecurity of 50% (SANAHNAES 2013), with a 6.5% precision around the estimate assuming a 15% household non-response rate, and a design effect of 1.5 with 95% confidence level and 80% power. This was adopted for Free State Province with an expected calculated average of 480 households per district. A lower precision, e.g., 7%, recommended for lower geographies, yields 346 households per region. The 6.5 % precision was informed by budgetary constraints on sample size and the fact that the recommended precision range between 2-10% for higher geographies (e.g. province, district) and at least 20% for lower geographies (livelihoods).

4.4.2 Determining sample size for nutritional indicators survey

The sampling did not aim at providing an estimate of malnutrition at lower geographies. The goal was to establish the link between food security and nutrition. It was estimated that a sample of 106 children under five for each stratum (district) converted into 366 households provides the required estimate of stunting of 21.5% (SANAHNAES 2013), with a 10% precision around the estimate assuming a 21% non-response rate, and a design effect of 1.5 with 95 % confidence level and 80% power. (See formula in Box 1 and parameters in Appendix 5 & 6.) The 10% precision was informed by budgetary constraints on sample size, and the fact that the study was only interested in linkages between malnutrition and food security in the households. However, the malnutrition prevalence was relatively precise at national and provincial levels. The recommended precision ranged between 2-10% for higher geographies (e.g., province) and between 10-20% for lower geographies (municipalities).

Table 3: Parameters for nutritional indicators

Parameters for Anthropometry	Value*	Value
Estimated Prevalence of stunting (%)	21.5%	21.5%
± Desired precision (MOE)	9%	10%
Power	80%	80%
Confidence Interval	95%	95%
Design Effect (if applicable)	1.5	1.5
Children to be included	131	106
Average HH Size	3.7	3.7
% Children under-5	11%	11%
% Non-response Households	21%	21%
Households to be included	452	366
Strata (Districts)	52	52
Total households for the study		
* SANHANES (Shisana et.al 2013) Appendix Table 1		

This survey was conducted in 137 SALs, across 5 districts in the province. Within each SAL, a random sample of 35 visiting points was identified. One household was to be selected at each visiting point. This yielded a total sample size of 4 795 households. Once a household was selected, specific household members were eligible to participate in the survey (as per the inclusion and exclusion criteria set, refer to 4.3). These include the head of the household and / or the person responsible for food procurement and food preparation, as well as the biological mother of any children under the age of 5 years and all children between the ages of 0-5 years. We had estimated that, on average each household will yield 3 people. The total sample was thus 4 795. The survey managed to get 300 children in the province.

4.4.3 Sampling procedure: selecting clusters

The representativeness of the sample also depends on the sample structure including the selection of clusters and households within clusters. Clusters or SALs within districts were selected using PPS (Probability Proportional to Size) which measures the size of the number of households in each SAL. To ensure results could be reported at district or livelihood zones, the SALs were distributed across the livelihood zones within each district.

We adopted the World Food Program (WFP) Technical Guideline, which defines a cluster based on SALs, cluster size or the number of household's survey teams that can visit safely in one day, and the number of clusters with a number of households in each for each indicator. Usually, 20 to 30 clusters/EAs per stratum are typical for most settings (Technical Guideline, WFP- see Appendix I). In this province, 35 households per cluster or (SAL) were thus used.

4.4.3.1 Household Response Rate

Out of the targeted 4795 visiting points (VPs), 96,4% were valid. Out of these valid VPs, 60.8% of them (2 916) were realised or interviewed, while the refusals accounted for 8.9%. Absent or 'other' constituted 30.3%. 'Other' included those who were not eligible to participate such as those who were incapacitated, were under-age and had no adult to consent, were not at home for the duration of the study and those who could not participate due to COVID-19 exposure. Lejweleputswa recorded the highest realisation rate of 65.7%, while Fezile Dabi accounted for the least percentage with 57.9%.

Table 3b: Household response rate by district

	Total VPs	Valid VPs		Interviewed		Refused		Absent/Other	
District	**n**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Xhariep	980	938	95.7	585	59.7	61	6.2	258	26.3
Lejweleputswa	945	915	96.8	621	65.7	40	4.2	266	28.1
Thabo Mofutsanyane	980	930	94.8	611	62.3	73	7.4	399	40.7
Fezile Dabi	945	915	96.8	548	57.9	85	8.9	274	28.9
Mangaung	945	928	98.2	551	58.3	166	17.5	257	27.2
Total	**4 795**	**4 626**	**96.4**	**2 916**	**60.8**	**425**	**8.9**	**1454**	**30.3**

Table 4 shows characteristics of household heads and members from the households that were realised by local municipality. Due to low numbers at household head level, further breakdown by local municipalities throughout the report was done only for household members.

Table 4: Characteristics of the sample for household heads and members by local municipality

	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Municipality						
Dihlabeng	5.1	[4.4-6.0]	150	5.4	[4.9-5.8]	527
Kopanong	4.6	[3.9-5.4]	134	3.4	[3.0-3.8]	332
Letsemeng	6.1	[5.3-7.0]	178	6.4	[6.0-6.9]	631
Mafube	2.3	[1.8-2.9]	67	2.4	[2.1-2.7]	238
Maluti a Phofung	8.6	[7.7-9.7]	252	9.3	[8.7-9.9]	913
Mangaung	25.1	[23.6-26.7]	732	23	[22.2-23.9]	2,261
Mantsopa	1.1	[0.8-1.5]	32	1.2	[1.0-1.4]	117
Masilonyana	2.5	[2.0-3.2]	74	2.8	[2.5-3.2]	278
Matjhabeng	13.4	[12.2-14.7]	391	13.7	[13.0-14.4]	1,343
Metsimaholo	4.8	[4.1-5.7]	141	5.2	[4.8-5.7]	511
Mohokare	4.6	[3.9-5.5]	135	4.2	[3.9-4.7]	417
Moqhaka	6.1	[5.3-7.1]	179	5.9	[5.5-6.4]	584
Nala	2.9	[2.3-3.6]	84	3.3	[2.9-3.6]	322
Ngwathe	5.5	[4.7-6.4]	161	5.4	[5.0-5.9]	535
Nketoana	1.9	[1.5-2.4]	55	2.3	[2.0-2.6]	223
Phumelela	1.5	[1.1-2.0]	44	2	[1.7-2.3]	196
Setsoto	2.7	[2.1-3.3]	78	3.2	[2.8-3.5]	312
Tswelopele	1	[0.7-1.4]	29	0.9	[0.7-1.1]	84
Total	**100**		**2,916**	**100**		**9,824**

4.4.3.2 Delimitation of the Household Economic Approach (HEA)

Three open-access livelihood zones were selected for the qualitative analysis of the study. These zones lie across all districts in the province. These livelihoods are open access, and most households are involved in farming and use other sources of income such as casual labour, small business, grants and salaried employment to complement their livelihood needs. Ten communities/ villages were selected from each livelihood zone and thirty-six focus group discussions were conducted in each livelihood zone. The discussions were based on determinants of wealth, sources of food, and income and expenditure as stipulated by the key informants and focus group participants from various livelihood zones.

4.5 Field Data Collection

Discussions were undertaken with community representatives (key informants) to develop wealth breakdown for the selected community or study area. A grouping of people based on local definitions of wealth and a quantification of assets within communities was the major focus.This process disaggregated the community population and households into common 'access' groups, which allowed key informants to isolate important differences in households' assets, capital, vulnerabilities to different shocks and to estimate numbers of people who will be affected by different changes. Key informants from each communities managed to identify participants for each wealth group based on the wealth characteristics which were established based on the local definition of wealth. Community leaders assisted with organising 4-6 people from each wealth group from different households. At least half of the participants or groups were women. The approach identified a typical household size of each wealth group and quantified available household food and income sources to caloric measurement (8800KJ/person/day) and income equivalent to meet household needs for the whole year. The 8800KJ/person/day is used as a survival threshold. The data collection process in the field was preceded by a training which followed an operational manual for field staff. The manual encapsulated processes and steps for household survey data collection, together with the HEA data collection in the selected livelihood zones. The primary purpose of the training was to outline the standard procedure for the fieldwork to ensure consistency and systematic enquiry across the data collection activities. In doing so, the protocol ensured that the fieldwork was consistent, rigorous and that it upholds the highest degree of ethical standards. Some of the broad undertakings enshrined in the training included the Standard Operational Guideline for data collection in the COVID-19 environment, ethics, and the broader governance structure and team structure. (Refer to Operational Manual Annexure)

4.5.1 COVID-19 safety procedures and protocols

The preliminary survey took place during the outbreak of the COVID-19 pandemic. As such, a COVID-19 Standard Operation Procedure (SOP) was designed to ensure compliance with a set of rules, regulations, principles, and guidelines imposed to mitigate the exposure and risks of infections by research participants and data collectors. Prior to the study, all enumerators were tested for COVID-19. Each research team, under the leadership of their team leader, was provided with COVID-19 apparatus such as a thermometer, and protection during the fieldwork. All COVID-19 prevention precautionary measures were strictly adhered to throughout the data collection exercise.

4.5.2 Survey data collection

Some of the salient steps articulated to field workers during the training included, among others:

- Entering an SAL (community entry and stakeholder identification), identification of Visiting Points (VPs) (using maps and GPS coordinates), selection of household (using the Kish Grid), and obtaining verbal consent.

4.5.3 Structured household questionnaire administration

This component constituted the quantitative dimension of food and nutrition security. This approach employed a survey that involved structured household questionnaire administration in the five districts. A total of 137 Small Area Layer (SALs) with a total of 4 795 households were pre-selected for the survey using Geographic Information Systems with maps developed and used for identification of the selected households. A combined set of questionnaires with both food security and nutrition indicators was administered within a household.

In each household, the head of the household was targeted as a respondent on household food security status, whilst the care giver or the mother was targeted as a respondent for individual nutrition questions for adults and children within the household. The food utilisation dimension involved anthropometric measurements such as height, weight, etc. (see Table 1). Data collection was done using tablets that were linked to the central server, where data was deposited through real-time streaming that took place under strict supervision.

There was rigorous training on the data collection instruments i.e., Household Questionnaire, looking at all the dimensions of food security and the questions related to the food security and nutrition indicators thereof.

The nutrition section of the household questionnaire followed the SMART standard procedure. Some of the key indicators pertain to Anthropometric measurements and MUAC, as well as the individual household set of questions.

4.5.4 HEA Data collection

Some of the salient HEA steps articulated to field workers during the training included:

- Broader understanding of livelihood strategies;
- Problem specification and understanding of the coping strategies.

4.6 HEA Sampled Livelihood Zones

4.6.1 Free State Open Access Cattle and Crops Livelihood Zone (ZAOCC) of Thaba Nchu District

This livelihood zone is centred around Thaba Nchu, a town 60km from Bloemfontein within the Mangaung Metro. It is also one of the five districts in Free State Province. Thaba Nchu was established in 1892 and its geographical coordinates are 29°13"0 South, and 26°50"0 East. The N8 highway runs through the zone. The population is largely made up of Tswana and Sotho people.

- Most of the surrounding land in Thaba Nchu is arable, which has been employed for large scale farming for both commercial and domestic production;
- Crop farming and livestock husbandry are limited as the zone is densely populated, so households also depend on other sources of income; and
- A variety of wildlife and birds are found in the area and within the Maria Moroka Game reserve.

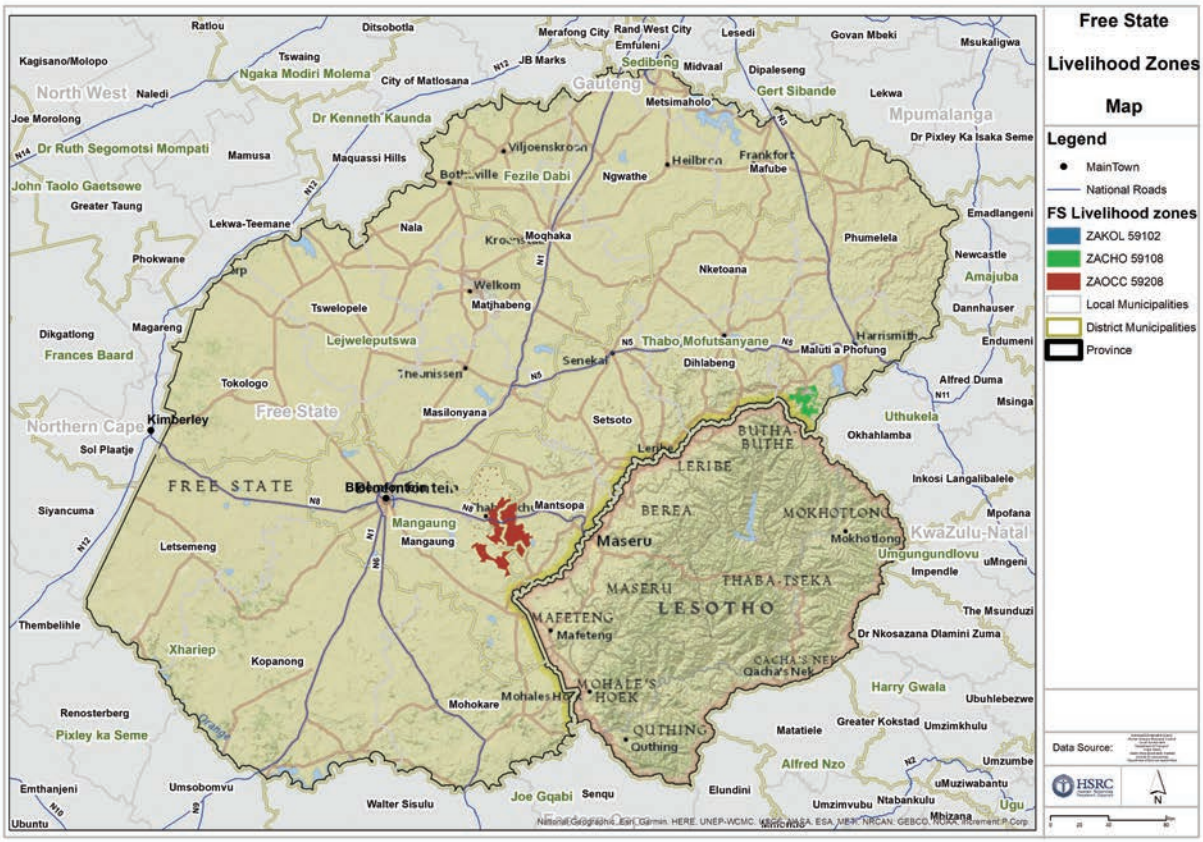


Figure 3: *Map of ZABOL livelihood Zone*

Most of the zone receives 500-5 500mm mean annual rainfall and crop production is relatively poor because of poor quality clay and sandy soils. The temperature ranges from 16°C to 34°C in summer and -2°C to 14°C in winter. The main crops that are grown for food are maize and vegetables. Moisture availability is considered 'slight' and the land capability in the zone is classified as 'marginal potential arable', due to its low rainfall and soils. Wealthier households keep cattle, sheep, and goats, which makes use of the extensive grazing in the surrounding veld. Households also depend on casual labour, remittances, and grants.

The Thaba Nchu Town is very traditional and is governed by His Majesty Chief Albert Moroka. He is still responsible for managing communities, and most civil matters and still judges at the tribal court. The town serves as the main administrative and business centre for people in the zone, while Bloemfontein is the secondary large centre.

4.6.2 Highlands Open Access Livestock (ZACHO) of Thabo Mofutsanyane District

This livelihood zone covers a number of districts in both Eastern Cape and Free State provinces. It covers an area of 95,600ha in the Eastern Cape and 51,100ha in the Free State. It includes Qua Qua and the strip of land along the northern border of the Eastern Cape with Lesotho. It has very cold winters (snow is common and regular) and the land is not suitable for cultivation as it is hilly and less fertile. Most of the surrounding land in Thabo Mufutshanyana and Alfred Nzo is more grazing than arable and is suitable for domestic production of both livestock and crop production. The grazing does support livestock, although the population density in Qua Qua is high and work opportunities are limited. Livestock, consisting of cattle, goats, and sheep are the basis of the economy, with other sources of income such as petty trading, casual labour, and grants playing an important role for households. Water and good pasture are scarce and good access to the two is essential for production.

The vegetation consists of valley bush shrubs and grasslands. It has poor sandy soils and is fairly flat with shallow valleys, is mountainous, and has lowlands with mixed soil types dominated by red soils (DAFF, 2015). The population is largely made up of Xhosa people.

- The average population density ranges around 41 people per km^2;
- Livestock holdings limited by population density; and
- Livelihoods are augmented by other income sources such as remittances, trading, grants, and casual or formal labour.

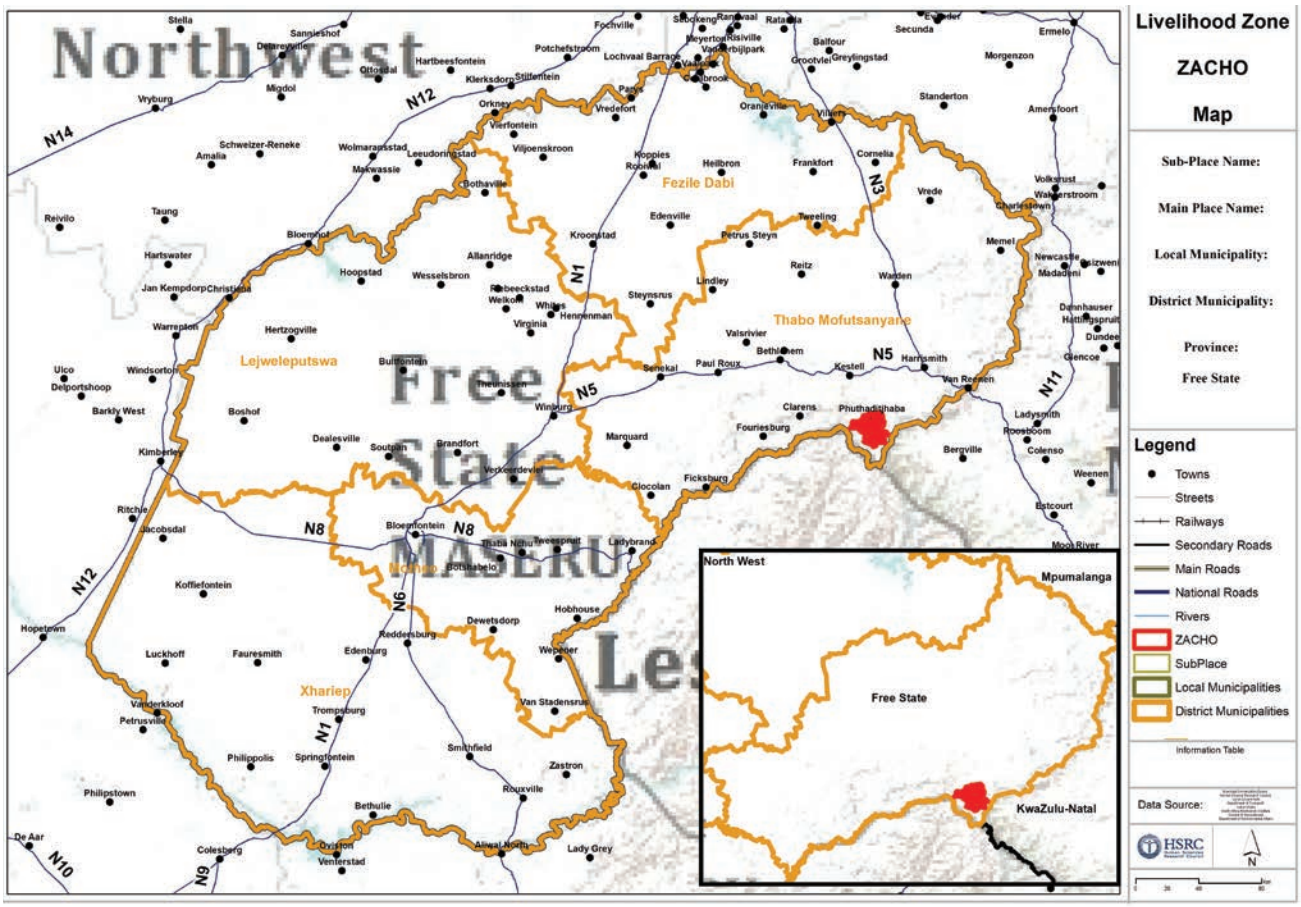


Figure 4: *Map of ZACHO Livelihood Zone*

Most of the zone receives 500-5 500mm mean annual rainfall, and crop production is relatively poor because of poor quality clay and sandy soils. The temperature ranges from 16°C to 34°C in summer, and -2°C to 14°C in winter. The main crops that are grown for food are maize and vegetables, and also stone fruits, but not for commercial purposes. Moisture availability is considered 'slight' and the land capability in the zone is classified as 'marginal potential arable', due to its low rainfall and soils. Wealthier households keep cattle, sheep, and goats which make use of the extensive grazing in the surrounding veld and also have stone fruit trees, especially peach, in every household, even though there is a reduction of or no yield of peach due to drought and poor management of trees/orchards.

The Alfred Nzo and Thabo Mofutsanyana districts are very traditional and are governed by chiefs. The chiefs are still responsible for managing communities' civil matters and are still judges at the tribal court. The towns serve as the main administrative and business centre for people in the zone.

Wealthier households keep cattle, goats, and sheep, which make use of the extensive grazing in the surrounding open-access areas. Households also depend on both formal and informal cash transfers.

4.7 Data Management, Weighting and Analysis

4.7.1 Data management

A database reflecting the quantitative survey questionnaire was designed by joining different projects/ forms using the REDCap. REDCap was the preferred technology because the application allows for data collection where there is no internet service (e.g., no Wi-Fi or cellular service) or where there is unreliable internet service. The data was captured/collected electronically using CAPI (Computer Assisted Personal Interviewing) technology by using tablets.

The data was transmitted to the central database. Once all the data was collected, it was downloaded and converted into Statistical Analyses Systems (SAS) and Statistical Package for Social Scientists (SPSS) for further manipulation. Data management included data-cleaning exercises. Data was checked and edited for logical consistency, for permitted range checks, for reliability on derived variables and for filter instructions. Data with wrong small area layer (SAL) numbers was also cleaned.

Due to the COVID-19 pandemic, HSRC researchers could not do physical back checks, but extensive telephonic back checks were undertaken in the province. A total of more than 15% back checks were undertaken to validate the methodology and fill in the missing gaps in the data.

Captured data and validated data that contains 2 916 cases, and 3 394 variables were converted to (SPSS) for descriptive analyses and exploration of data quality. Verified and cleaned data was further converted to Stata and SAS for further detailed exploratory analyses, cross-tabulations, weighting, and analyses.

4.7.2 Data weighting

The data was weighted to take into account the fact that not all participants covered in the survey had an equal chance of being selected. The weighting reflected the relative selection probabilities of the individual at the three main stages of selection: visiting point (address), household, and individual. To ensure the representativity of non- responses and smaller groups, weights needed to be applied.

SAL base weights were appropriately adjusted to incorporate non-response at an SAL level. Households within SAL also had a base weight as they were sampled a priori. However, not all sample households were available or agreed to participate. Thus, the household base weights were further adjusted using a non-response correction factor of the ratio of sampled households divided by realised households. Sampled individuals within a household had a weight computed as the ratio of the number of eligible household members and the targeted individuals in the household. The final sample individual weight was computed as the product of the weights from SAL, household and individual.

The survey is a national survey; thus, the results should be generalisable to the entire population. The sample was then benchmarked to the population of the province. These benchmark variables for persons and district of the respondent in the household were selected due to their reliability and validity. The marginal totals for the benchmark variables were obtained from the Free State Province 2021 mid-year population estimates as published by Statistics South Africa. The estimated South African population was therefore used as the target population. Person and household weights were benchmarked using the Stata survey commands.

A total of 2 916 people were interviewed in this province. When weighted, this total represents 1 920 872 South Africans living in the Free State Province who are 18 years and older.

The final data set (unweighted and weighted) are disaggregated by key demographic variables of household heads.

Table 5: District weighted and unweighted N's for household heads

District	Unweighted N	Weighted N
Fezile Dabi	548	342 162
Lejweleputswa	578	381 467
Mangaung	732	663 603
Thabo Mofutsanyane	611	473 828
Xhariep	447	59 812
Total	**2 916**	**1 920 872**

Table 6: Gender weighted and unweighted N's for household heads

Gender	Unweighted N	Weighted N
Male	**1573**	**904 553**
Female	1343	1 016 319
Total	**2 916**	**1 920 872**

Table 7: Age groups weighted and unweighted N's for household heads

Age groups	Unweighted N	Weighted N
18-24	131	323 182
25-34	404	498 483
35-44	580	407 013
45-54	619	285 473
55-64	575	210 770
65+	607	195 950
Total	**2 916**	**1 920 872**

4.7.3 Data analysis

Descriptive statistical analyses were conducted as a first step towards developing insights from the data collected. Stata and SPSS software packages were used to obtain the proportions of responses and cross-tabulations. Weighted [benchmarked to the 2021 mid-year] population estimates provided by Statistics South Africa (Stats SA) for age, race, age group, and province], was done to ensure that the estimates of the food and nutrition survey variables were aligned with the general population of Free State Province. Analyses of weighted data were conducted considering the multi-level sampling design and adjusting for non-responses.

5 Demographics

5.1 Demographics of the Respondents

5.1.1 Characteristics of the household heads and members

Table 8 depicts the characteristics of household heads and members from the households that were realised. More than half (53.9%) of the household heads were males. The black African population group accounted for about 92.3%, while those aged between 45 and 54 years old constituted 21.2%. In terms of marital status, those who were married or living together accounted for 42.3%. Mangaung District recorded the highest percentage with 25.1%, while Xhariep District accounting for the least proportion with 15.3%. Regarding household members, more than half of (54.4%) household members were females, 92.6% were Black Africans and the majority were children aged 0 to 14 years old, with 28.2%. About two-thirds (68.0%) of the household members were single. Mangaung and Thabo Mofutsanyane districts had the highest percentage of household members, with around 23% each, while Xhariep District had the least, with a paltry, 14.0%.

Table 8: Characteristics of the sample for household heads and members

	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Sex						
Male	53.9	[52.1-55.7]	1 573	45.6	[44.6-46.5]	4 468
Female	46.1	[44.3-47.9]	1 343	54.4	[53.5-55.4]	5 340
Total	**100**		**2 916**	**100**		**9 808**
Population group						
African	92.3	[91.3-93.2]	2 692	92.6	[92.0-93.1]	9 087
White	2.8	[2.3-3.5]	83	2.5	[2.2-2.8]	241
Coloured	4.6	[3.9-5.4]	133	4.7	[4.3-5.2]	465
Indian/Asian	0.3	[0.1-0.5]	8	0.2	[0.1-0.3]	22
Total	**100**		**2 916**	**100**		**9 815**
Age group						
0-14	-	-	-	28.2	[27.3-29.1]	2 667
18-24 (15-24 for HH members)	4.5	[3.8-5.3]	131	17.7	[17.0-18.5]	1 675
25-34	13.9	[12.6-15.2]	404	15.1	[14.4-15.9]	1 432
35-44	19.9	[18.5-21.4]	580	12.4	[11.7-13.1]	1 171
45-54	21.2	[19.8-22.8]	619	10.3	[9.7-10.9]	972
55-64	19.7	[18.3-21.2]	575	8.7	[8.1-9.2]	818
65+	20.8	[19.4-22.3]	607	7.6	[7.1-8.2]	719

	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Total	100		2 916	100		9 454
Marital status						
Married/Living together	42.3	[40.5-44.1]	1 227	24.1	[23.2-24.9]	2 352
Divorced/Widowed/Separated	24.3	[22.7-25.9]	704	8	[7.5-8.5]	780
Single	33.4	[31.7-35.2]	970	68	[67.0-68.9]	6 6 45
Total	**100**		**2 901**	**100**		**9 777**
District						
Fezile Dabi	18.8	[17.4-20.3]	548	19	[18.3-19.8]	1 868
Lejweleputswa	19.8	[18.4-21.3]	578	20.6	[19.8-21.4]	2 027
Mangaung	25.1	[23.6-26.7]	732	23	[22.2-23.9]	2 261
Thabo Mofutsanyane	21	[19.5-22.5]	611	23.3	[22.5-24.1]	2 288
Xhariep	15.3	[14.1-16.7]	447	14	[13.4-14.7]	1 380
Total	**100**		**2 916**	**100**		**9 824**

5.1.2 Education attainment of household heads

Table 9 highlights the education attainment of the household heads. Secondary school education accounted for 37.8%, followed by those with matric qualifications at 30.3%. The older household heads, those aged 65 years and older and those aged 55 years to 64 years, had higher percentages of no schooling, with 20.8% and 7.2%, respectively. Mangaung District had the highest percentage of (33.7%) household heads with tertiary education, while Thabo Mofutsanyane District had the highest percentage of household heads (7.7%) who never attended any school.

Table 9: Educational attainment of household heads by sex, age, and district

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	2.5	[1.7-3.6]	15.1	[12.4-18.4]	39	[33.1-45.2]	33.1	[28.2-38.4]	10.3	[7.4-14.2]
Female	6	[4.6-7.8]	23.4	[19.4-27.9]	36.7	[32.5-41.1]	27.8	[23.6-32.4]	6.1	[4.1-9.0]
Total	4.4	[3.4-5.6]	19.5	[16.6-22.9]	37.8	[34.0-41.7]	30.3	[26.6-34.2]	8.1	[6.1-10.6]
Age group										
18-24	1.5	[0.4-6.2]	8.1	[2.8-21.4]	36.4	[23.7-51.4]	44	[31.9-56.7]	10	[5.3-18.2]
25-34	0.9	[0.3-2.9]	6.9	[3.3-13.9]	45.5	[39.4-51.8]	38.7	[31.3-46.6]	8	[5.1-12.5]
35-44	1.6	[0.7-3.8]	10.4	[7.4-14.4]	44.7	[39.4-50.0]	33.9	[28.8-39.4]	9.5	[6.1-14.5]
45-54	4.2	[2.5-6.9]	24.3	[19.7-29.5]	37.3	[32.6-42.2]	27.5	[22.8-32.8]	6.7	[4.0-11.0]

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
55-64	7.2	[4.8-10.9]	47.3	[40.9-53.9]	26.5	[21.9-31.7]	11.6	[8.3-15.9]	7.3	[4.0-12.9]
65+	20.8	[15.8-26.8]	52.6	[45.9-59.3]	18.8	[14.5-24.0]	3	[1.7-5.3]	4.8	[2.9-7.9]
Total	4.4	[3.4-5.6]	19.5	[16.6-22.9]	37.8	[34.0-41.7]	30.3	[26.6-34.2]	8.1	[6.1-10.6]
District										
Fezile Dabi	3.1	[2.0-4.6]	19.8	[14.1-27.1]	37.1	[31.8-42.6]	32.3	[26.0-39.3]	7.7	[4.3-13.4]
Lejweleputswa	3	[1.3-6.5]	17.8	[12.1-25.4]	46	[36.4-56.0]	25.8	[20.8-31.6]	7.4	[4.5-11.8]
Mangaung	3.2	[1.9-5.3]	17.6	[12.5-24.2]	35.4	[28.8-42.7]	33.7	[25.8-42.6]	10.1	[5.9-16.5]
Thabo Mofutsanyane	7.7	[5.7-10.3]	22.6	[16.9-29.6]	34.7	[28.7-41.2]	28.6	[22.8-35.1]	6.5	[3.8-10.8]
Xhariep	7.3	[4.6-11.4]	26	[19.2-34.2]	39.1	[33.4-45.0]	22.7	[14.9-32.9]	4.9	[2.0-11.6]
Total	**4.4**	**[3.4-5.6]**	**19.5**	**[16.6-22.9]**	**37.8**	**[34.0-41.7]**	**30.3**	**[26.6-34.2]**	**8.1**	**[6.1-10.6]**

5.1.3 Education attainment of household members

Table 10 shows the education attainment by the household members aged 7 years and older. Secondary school education accounted for 34.9%, followed by those with primary school education with 32.1%. The older household members, those aged 65 years and older and those aged 55 years to 64 years, had higher percentages of no schooling, with 21.6% and 10.1%, respectively. When considering those aged 20 years and older, 5.2% of household members did not have any form of schooling, while 23.1% had matric education.

Table 10: Educational attainment of household members by sex, age, and district

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	3.2	[2.6-3.8]	33.3	[31.8-34.8]	34	[32.5-35.6]	23.6	[22.2-25.0]	6	[5.2-6.8]
Female	4.5	[3.9-5.2]	31.2	[29.9-32.6]	35.5	[34.1-36.9]	22.7	[21.5-24.0]	6	[5.3-6.7]
Total	3.9	[3.5-4.3]	32.1	[31.1-33.2]	34.9	[33.8-35.9]	23.1	[22.2-24.0]	6	[5.5-6.5]
Age group										
7-14	0.7	[0.4-1.2]	86.5	[84.6-88.1]	12.4	[10.9-14.2]	0.3	[0.1-0.8]	0.1	[0.0-0.5]
15-24	0.7	[0.4-1.2]	9.4	[8.1-10.9]	52.1	[49.7-54.5]	32.5	[30.3-34.8]	5.3	[4.3-6.5]
25-34	0.9	[0.5-1.6]	6.7	[5.5-8.1]	40.7	[38.1-43.2]	40.8	[38.3-43.4]	11	[9.4-12.7]
35-44	1.5	[0.9-2.4]	12.4	[10.6-14.5]	44.2	[41.3-47.1]	33.3	[30.6-36.1]	8.6	[7.1-10.4]
45-54	3.8	[2.7-5.2]	26.1	[23.4-29.0]	36.4	[33.4-39.5]	27.3	[24.6-30.3]	6.4	[5.0-8.2]
55-64	10.1	[8.2-12.4]	43.6	[40.2-47.0]	29.7	[26.6-32.9]	11.1	[9.1-13.5]	5.5	[4.1-7.3]
65+	21.6	[18.7-24.8]	47.4	[43.7-51.1]	19.9	[17.1-23.0]	5.6	[4.1-7.5]	5.6	[4.1-7.5]
Total	**3.9**	**[3.5-4.3]**	**32.1**	**[31.1-33.2]**	**34.9**	**[33.9-35.9]**	**23.1**	**[22.2-24.0]**	**6**	**[5.5-6.5]**

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
District										
Fezile Dabi	2.9	[2.1-3.8]	31.9	[29.6-34.2]	34.6	[32.3-37.0]	24.7	[22.6-26.9]	6	[4.9-7.3]
Lejweleputswa	2.2	[1.6-3.1]	33.2	[31.0-35.4]	37.3	[35.1-39.7]	21	[19.1-23.0]	6.3	[5.2-7.5]
Mangaung	2.4	[1.8-3.1]	30.1	[28.1-32.2]	34.3	[32.2-36.4]	25.4	[23.5-27.4]	7.9	[6.8-9.2]
Thabo Mofutsanyane	5.4	[4.4-6.5]	31.8	[29.7-33.9]	34.5	[32.4-36.7]	22.9	[21.0-24.8]	5.5	[4.5-6.6]
Xhariep	7.9	[6.5-9.6]	35	[32.3-37.8]	33.4	[30.7-36.2]	20.6	[18.4-23.1]	3.1	[2.3-4.3]
Total	**3.9**	**[3.5-4.3]**	**32.1**	**[31.1-33.2]**	**34.9**	**[33.9-35.9]**	**23.1**	**[22.2-24.0]**	**6**	**[5.5-6.5]**

5.1.4 Employment status

Table 11 shows that among the household heads and members who were economically active, 54% and 74.5%, respectively, were unemployed. A higher proportion (68.3%) of female household heads were unemployed compared to their male counterparts, with 39.5% being unemployed. For household members, a similar pattern exists. About 74% of female household members were unemployed compared to 61.6% of males. Among the youth, those aged 34 years and younger, the unemployment rate was 57.6% and 80.3% for household heads and members, respectively. Those aged between 55 and 64 years old had the highest unemployment rate of 73.3% household heads, while the younger people (15 to 24 years) had the highest unemployment rate of 93.1%. The highest unemployment rate for household heads and members was reported in Thabo Mofutsanyane and Lejweleputswa districts, with 62.0% and 72.9%, respectively.

Table 11: Employment status of household heads by sex, age, and district

	Household Heads				Household Members			
	Employed		Unemployed		Employed		Unemployed	
Variable	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex								
Male	60.5	[52.1-68.4]	39.5	[31.6-47.9]	38.4	[36.5-40.2]	61.6	[59.8-63.5]
Female	31.7	[27.3-36.5]	68.3	[63.5-72.7]	25.5	[24.0-27.1]	74.5	[72.9-76.0]
Total	**46**	**[40.6-51.5]**	**54**	**[48.5-59.4]**	**31.3**	**[30.2-32.6]**	**74.5**	**[67.4-69.8]**
Age group								
18-24 (15 -24 for HH Members)	28.5	[15.8-45.8]	71.5	[54.2-84.2]	6.9	[5.8-8.3]	93.1	[91.7-94.2]
25-34	51	[41.5-60.4]	49	[39.6-58.5]	34.3	[31.9-36.9]	65.7	[63.1-68.1]
35-44	59.9	[52.7-66.6]	40.1	[33.4-47.3]	49.6	[46.6-52.5]	50.4	[47.5-53.4]
45-54	50.3	[44.8-55.8]	49.7	[44.2-55.2]	47.6	[44.4-50.8]	52.4	[49.2-55.6]
55-64	26.7	[21.6-32.5]	73.3	[67.5-78.4]	29.3	[26.3-32.6]	70.7	[67.4-73.7]
Total	**46**	**[40.6-51.5]**	**54**	**[48.5-59.4]**	**31.3**	**[30.1-32.5]**	**68.7**	**[67.5-69.9]**

Variable	Household Heads				Household Members			
	Employed		Unemployed		Employed		Unemployed	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
District								
Fezile Dabi	58.7	[43.5-72.3]	41.3	[27.7-56.5]	34.5	[31.8-37.4]	65.5	[62.6-68.2]
Lejweleputswa	49.1	[36.6-61.7]	50.9	[38.3-63.4]	27.1	[24.7-29.8]	72.9	[70.2-75.3]
Mangaung	43.4	[35.5-51.6]	56.6	[48.4-64.5]	31.9	[29.5-34.4]	68.1	[65.6-70.5]
Thabo Mofutsanyane	38	[30.2-46.5]	62	[53.5-69.8]	29.2	[26.8-31.7]	70.8	[68.3-73.2]
Xhariep	49	[36.2-62.0]	51	[38.0-63.8]	35.2	[32.0-38.5]	64.8	[61.5-68.0]
Total	**46**	**[40.6-51.5]**	**54**	**[48.5-59.4]**	**31.3**	**[30.1-32.5]**	**68.7**	**[67.5-69.9]**

At local municipality level, the following local municipalities: Masilonyana, Maluti a Phofung, Nala, and Tswelopele fell under the highest band (73.4% to 79.5%) of unemployed household members (Figure 5). Kopanong and Mafube local municipalities were under the lowest band of 52.0 to 52.3% of household members being unemployed.

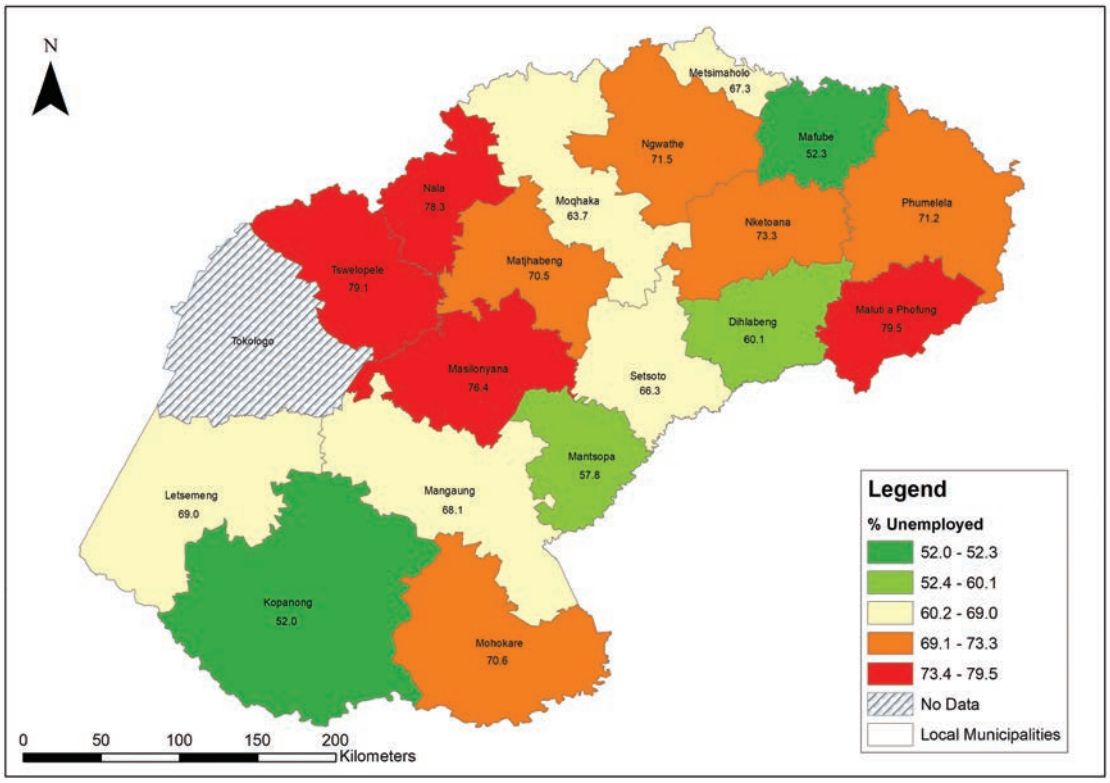


Figure 5: *Employment status of household members by the local municipality*

Table 12 shows household income by household head sex, age, and district. The highest percentage (33.2%) was recorded among households which recorded between R1 501-R3 000, followed by those who had no income or earned less than R1 500, with 21.0%. Male-headed households had significantly higher percentage (24.7%) of household income of more than R6 000, compared to female-headed ones with 10.8%. Households headed by those aged from 35 to 44 years old had the highest percentage of household income of more than R6 000 with 23.7%. Thabo Mofutsanyane had the highest percentage (25.5%) of households with no income or earned less than R1 500, while Mangaung District had the highest percentage (21.9%) of households which earned more than R6 000.

Table 12: Household income by sex, age, and district

	No income or <R1500		R1501-R3000		R3001-R4500		R4501-R6000		>R6000	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	19.3	[16.4-22.5]	25.4	[22.9-28.1]	18.4	[16.1-21.0]	12.2	[10.3-14.4]	24.7	[21.5-28.3]
Female	22.9	[19.9-26.3]	42.3	[38.9-45.8]	15.1	[13.2-17.3]	8.8	[6.9-11.2]	10.8	[8.4-13.8]
Total	**21**	**[18.5-23.7]**	**33.2**	**[30.9-35.5]**	**16.9**	**[15.3-18.6]**	**10.6**	**[9.1-12.4]**	**18.3**	**[15.9-21.0]**
Age group										
18-24	35.6	[23.4-50.0]	30.1	[22.9-38.4]	8.7	[4.3-17.0]	15.7	[6.9-32.1]	9.9	[5.6-16.9]
25-34	33.2	[27.2-39.8]	23.7	[19.2-28.9]	15.5	[10.8-21.8]	11.7	[8.3-16.2]	15.8	[11.7-21.0]
35-44	27.6	[22.8-33.1]	23	[19.4-27.0]	14.1	[11.2-17.7]	11.6	[8.8-15.2]	23.7	[19.2-28.8]
45-54	26.3	[22.0-31.2]	27.4	[23.6-31.6]	15.1	[12.1-18.6]	10.2	[7.8-13.3]	21	[17.1-25.5]
55-64	16.2	[13.0-19.9]	41	[35.9-46.3]	17.4	[14.3-21.0]	8.1	[5.6-11.4]	17.4	[13.2-22.4]
65+	3	[1.8-5.0]	48.1	[44.1-52.0]	23.2	[19.7-27.2]	10.7	[8.2-14.0]	14.9	[11.9-18.6]
Total	**21**	**[18.5-23.7]**	**33.2**	**[30.9-35.5]**	**16.9**	**[15.3-18.6]**	**10.6**	**[9.1-12.4]**	**18.3**	**[15.9-21.0]**
District										
Fezile Dabi	17.4	[13.2-22.6]	31.2	[26.1-36.9]	22.2	[18.2-26.7]	12.6	[9.4-16.7]	16.6	[13.4-20.3]
Lejweleputswa	22.1	[17.9-26.9]	34	[29.6-38.7]	17	[13.5-21.3]	7.8	[5.1-11.6]	19.2	[13.8-26.0]
Mangaung	18.5	[13.6-24.8]	33.2	[29.0-37.8]	14.6	[12.1-17.4]	11.8	[8.9-15.6]	21.9	[17.0-27.7]
Thabo Mofutsanyane	25.5	[20.5-31.2]	34.4	[29.9-39.1]	15.3	[12.5-18.5]	10.4	[7.8-13.9]	14.5	[10.6-19.4]
Xhariep	16.9	[12.0-23.3]	29.6	[22.4-38.0]	20.6	[14.3-28.7]	11	[6.9-17.2]	21.8	[16.4-28.4]
Total	**21**	**[18.5-23.7]**	**33.2**	**[30.9-35.5]**	**16.9**	**[15.3-18.6]**	**10.6**	**[9.1-12.4]**	**18.3**	**[15.9-21.0]**

5.1.5 Access to social grants

Table 13 shows that the majority of household heads and members relied on social welfare grants (including old age grant) as their source of income with 36.7% and 42.6%, respectively. About a third (35.2%) of household heads reported salaries and wages as their source of income.

Table 13: Sources of income of household heads and members

	Household heads	Household members
Source of income	%	%
Social welfare grants (including old age grant)	36.7	42.6
Salaries and wages	35.2	16.5
Other	4.5	1.1

	Household heads	Household members
Net profit from business or professional practice/activities or commercial farming	4.2	1.8
Regular allowances/remittances received from non- Household members	2.7	0.8
Alimony, maintenance, and similar allowances from a divorced spouse, family members, etc., living elsewhere	1.6	0.5
Regular receipts from pension from previous employment and pension from annuity funds	1.1	1.0
Interest received and/or accrued on deposits, loans, savings certificates	0.7	0.0
Income from letting of fixed property	0.5	0.2
Income from small-scale farming	0.4	0.3
Income from share trading	0.1	0.1
Royalties	0.1	0.0
Dividends on shares (e.g., unit trusts)	0.0	0.0

Further breakdown of social welfare grants as source of income of household heads and members by sex, age, and district is explored in Table 14. Significantly, more female household heads (50.2%) relied on social welfare grants as a source of income compared to their male counterparts, with only 21.5% reporting social welfare grants as their source of income. A similar scenario is noticed at household members' level as there were significantly more females (48.4%) who relied on social welfare grants as source of income compared to their male counterparts with only 35.9%. Lejweleputswa District had the highest proportion of household heads (45.5%) and household members (52.4%) who relied on social welfare grants as their source of income.

Table 14: Social welfare grants as source of income of household heads and members by sex, age, and district

	Household heads who had social welfare grants as source of income			Household members who had social welfare grants as source of income		
Variable	**%**	**95% CI**	**n**	**%**	**95% CI**	**n**
Sex						
Male	21.5	[17.4-26.2]	1,566	35.9	[34.5-37.3]	4,463
Female	50.2	[43.2-57.1]	1,342	48.4	[47.1-49.7]	5,320
Total	**36.7**	**[31.8-41.8]**	**2,908**	**42.7**	**[41.7-43.7]**	**9,783**
Age group						
0-14	-	-	-	51.4	[49.5-53.3]	2,666
18-24 (15-24 for HH Members)	16.7	[8.9-29.0]	130	32.2	[30.0-34.5]	1,673
25-34	30.5	[23.5-38.6]	401	32.3	[30.0-34.8]	1,429
35-44	27.3	[21.5-34.1]	578	28.2	[25.7-30.9]	1,170

	Household heads who had social welfare grants as source of income			Household members who had social welfare grants as source of income		
Variable	**%**	**95% CI**	**n**	**%**	**95% CI**	**N**
45-54	31.9	[26.6-37.6]	618	30.6	[27.8-33.6]	970
55-64	57	[50.5-63.3]	574	55.4	[52.0-58.8]	817
65+	89.9	[86.1-92.7]	607	87.3	[84.7-89.6]	719
Total	**36.7**	**[31.8-41.8]**	**2,908**	**43.2**	**[42.2-44.2]**	**9,444**
District						
Fezile Dabi	39.1	[28.1-51.2]	547	51.5	[49.2-53.7]	1,862
Lejweleputswa	46.1	[35.4-57.1]	578	52.4	[50.2-54.5]	2,026
Mangaung	28.3	[20.8-37.3]	731	34.7	[32.7-36.7]	2,249
Thabo Mofutsanyane	40.4	[31.2-50.3]	605	38.6	[36.6-40.6]	2,281
Xhariep	27.3	[18.9-37.7]	447	36.4	[33.9-39.0]	1,378
Total	**36.7**	**[31.8-41.8]**	**2,908**	**42.7**	**[41.7-43.7]**	**9,796**

Figure 6 shows that Masilonyana, Nala, Ngwathe, and Tswelopele local municipalities fell under the highest band (52.0% to 62.2%) of household members who had social welfare grants as a source of income. Dihlabeng and Kopanong local municipalities recorded least percentages of household members who had social welfare grants as source of income as they were under the least band of 26.8% to 30.2%.

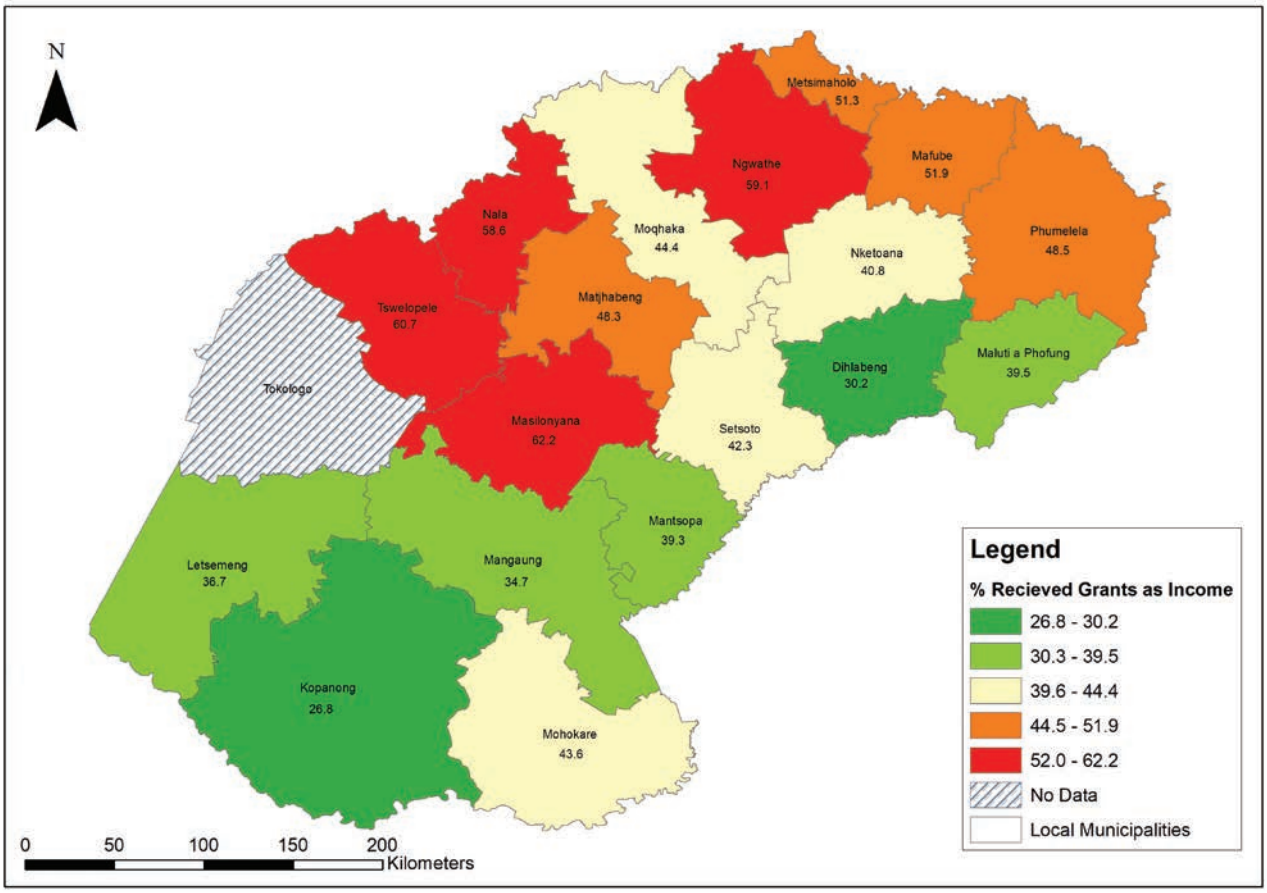


Figure 6: *Social welfare grants as source of income of household members by local municipality*

Table 15 shows household heads and members reported to be receiving a social grant(s) during the 12 months preceding the survey disaggregated by sex, age, and district. Similar trends were noticed among those who reported social welfare grants as their source of income. The majority of elderly household heads (90.3%) and members (87.8%) received social grants in the last 12 months prior to the survey. More than half (58.7%) of children aged 14 and younger received social grants in a year preceding the survey. Lejweleputswa District had the highest percentage of household heads (46.0%) and members (54.0%) who had received social grants during the 12 months preceding the survey.

Table 15: Household heads and members reported receiving any social grant(s) during 12 months prior to survey by sex, age, and district

	Household heads received social welfare grants a year prior survey			Household members received social welfare grants a year prior survey		
Variable	**%**	**95% CI**	**n**	**%**	**95% CI**	**n**
Sex						
Male	22.3	[18.4-26.9]	1,567	39.4	[38.0-40.9]	4,459
Female	51.1	[44.4-57.9]	1,339	51.6	[50.3-53.0]	5,316
Total	**37.6**	**[32.9-42.5]**	**2,906**	**46.1**	**[45.1-47.1]**	**9,775**
Age group						
0-14	-	-	-	58.7	[56.8-60.6]	2,660
18-24 (15 -24 for HH Members)	23	[14.8-33.8]	131	35.2	[33.0-37.5]	1,672
25-34	29.4	[23.2-36.5]	400	33.5	[31.1-36.0]	1,430
35-44	24.6	[18.8-31.5]	578	28.6	[26.0-31.2]	1,166
45-54	35.8	[30.5-41.5]	616	33.8	[30.9-36.9]	969
55-64	57.6	[51.3-63.7]	574	56.1	[52.6-59.4]	817
65+	90.3	[86.2-93.3]	607	87.8	[85.2-90.0]	719
Total	**37.6**	**[32.9-42.5]**	**2,906**	**46.4**	**[45.4-47.4]**	**9,433**
District						
Fezile Dabi	41.1	[30.1-53.1]	548	52.2	47.2-57.1	1,873
Lejweleputswa	46	[35.3-57.1]	577	54.0	48.3-59.5	2,022
Mangaung	30.8	[23.4-39.3]	729	39.7	35.4-44.1	2,253
Thabo Mofutsanyane	39.2	[30.3-48.9]	605	43.1	38.6-47.7	2,280
Xhariep	26.2	[20.1-33.4]	447	39.4	33.8-45.4	1,382
Total	**37.6**	**[32.9-42.5]**	**2,906**	**46.1**	**43.6-48.7**	**9,810**

*CI: Confidence Interval: Subtotals for the Province are not always equal due to non-response or missing data.

In terms of grant type, the dominant grant type for household heads was the old age grant which accounted for 38.0% (Table 16). Social relief distress was recorded at 36.5% and 22.5% for household heads and members, respectively. Child support grant constituted 25.7% and 51.6% for household heads and members, respectively.

Table 16: Social grant type received by household heads and members during 12 months prior to survey

Grant type	Household heads (%)	Household members (%)
Old age	38.0	20.9
Social relief destress	36.5	22.5
Child support	25.7	51.6
Disability	6.8	5.1
Care dependency	0.7	1.8
Foster care	0.5	1.0
Grant-in-aid	0.3	0.1
War veterans	0.0	0.0

Table 17 shows household heads and members reported receiving social relief during the 12 months prior to survey. One quarter (19%) of household heads reported receiving social relief during the 12 months prior to the survey, while 19.9% of household members were reported to have received social relief. Those aged 25 to 34 years old had the highest proportion of household heads (30.2%) and members (30.5%) who received social relief during the 12 months prior to the survey. Xhariep had the lowest percentage of (18.0%) household heads who received social relief during a year prior to the survey, which was lower than a provincial average of 25.3%.

Table 17: Household heads and members reported receiving social relief during 12 months prior to survey by sex, age, and district

	Household heads received social relief a year prior survey			Household members received social relief a year prior survey		
	%	95% CI	n	%	95% CI	n
Sex						
Male	19.8	[16.4-23.7]	1,567	16.7	[15.6-17.8]	4 460
Female	23.7	[17.2-31.7]	776	22.6	[21.5-23.7]	5 324
Total	**19**	**[14.5-24.3]**	**1 583**	**19.9**	**[19.1-20.7]**	**9 784**
Age group						
0-14	-	-	-	11.1	[10.0-12.4]	2 658
18-24 (15 -24 for HH Members)	26.7	[16.0-41.0]	131	24.9	[22.9-27.0]	1 673
25-34	30.2	[23.6-37.8]	399	30.5	[28.1-32.9]	1 431
35-44	21.8	[17.0-27.4]	579	23.4	[21.1-25.9]	1 171
45-54	29.3	[24.1-35.1]	618	26.1	[23.4-28.9]	971
55-64	23.3	[18.1-29.5]	574	19.8	[17.2-22.7]	817
65+	13.9	[9.1-20.5]	607	11.8	[9.7-14.4]	719
Total	**25.3**	**[22.1-28.7]**	**2 908**	**20.4**	**[19.6-21.2]**	**9 440**

	Household heads received social relief a year prior survey			Household members received social relief a year prior survey		
	%	95% CI	n	%	95% CI	n
District						
Fezile Dabi	27.1	[19.5-36.4]	547	24.9	20.5-29.8	1 870
Lejweleputswa	30.2	[24.2-37.0]	578	29.0	21.2-38.3	2 024
Mangaung	20.3	[14.9-27.1]	730	16.9	14.3-19.9	2 247
Thabo Mofutsanyane	27.8	[22.4-33.9]	606	17.6	15.3-20.2	2 289
Xhariep	18	[12.3-25.5]	447	12.8	8.8-18.3	1 376
Total	**25.3**	**[22.1-28.7]**	**2 908**	**21.1**	**18.6-23.8**	**9 806**

*CI: Confidence Interval: Subtotals or averages for the Province are not always equal given the non-response or missing data.

Figure 7 shows that Dihlabeng, Letsemeng, Kopanong, Mohokare, and Tswelopele local municipalities were under the lowest band of 10.5% to 11.9% of household members who received social relief during the year preceding the survey. Masilonyana local municipality fell under the highest band of 23.9% to 54.0%.

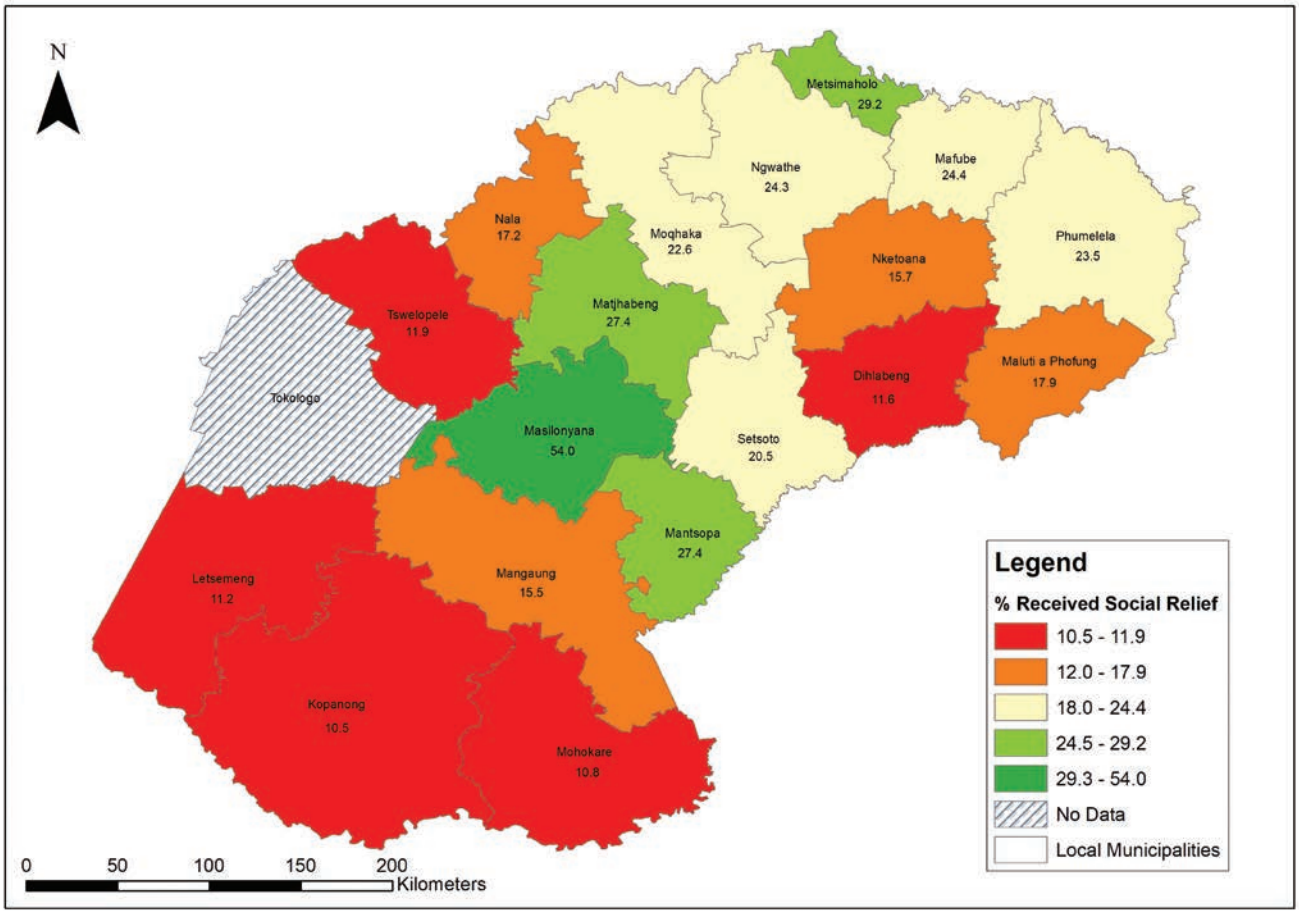


Figure 7: *Household members who received any social relief during 12 months prior to survey by local municipality*

The COVID-19 social relief grant was the dominant social relief type of grant for both household heads and members, with 65.5% and 50.3%, respectively (Table 18). Cash was the second most dominant grant, with 55.8% of household heads and 64.0% of household members reported having received it. Food accounted for around 3.5% and 1.9%of household heads and members, respectively.

Table 18: Social relief type received by household heads and members during 12 months prior to survey

Social Relief Type	Household heads (%)	Household members (%)
COVID-19	65.5	50.3
Cash	55.8	64.0
Food	3.5	1.9
Blankets	0.0	0.1
Clothes	0.0	0.1
Other	0.0	0.1

Further breakdown of the COVID-19 grant received by household members indicates that 51.5% of female members received this social relief grant compared to 49.7% of their counterparts (Table 19). Those aged 25 to 34 years old had the highest proportion, with 68.3%, followed by those aged 35 to 44 years old, with 64.5%. Mangaung District had the highest percentage (81.8%) of household members who received COVID-19 social relief grant during the 12 months prior to the survey. Lejweleputswa District had the lowest proportion of household members who received COVID-19 social relief grant, with 23.4%.

Table 19: Household members reported receiving COVID-19 grant during 12 months prior to survey by sex, age and district

	Yes		No		Total
Variable	**%**	**95% CI**	**%**	**95% CI**	**n**
Sex					
Male	49.7	[46.1-53.2]	50.3	[46.8-53.9]	763
Female	51.5	[48.7-54.3]	48.5	[45.7-51.3]	1,226
Total	**50.8**	**[48.6-53.0]**	**49.2**	**[47.0-51.4]**	**1,989**
Age group					
0-14	2.3	[1.1-4.8]	97.7	[95.2-98.9]	304
15-24	59.4	[54.7-64.0]	40.6	[36.0-45.3]	424
25-34	68.3	[63.8-72.5]	31.7	[27.5-36.2]	445
35-44	64.5	[58.7-69.9]	35.5	[30.1-41.3]	279
45-54	62.6	[56.5-68.3]	37.4	[31.7-43.5]	254
55-64	46.7	[39.3-54.3]	53.3	[45.7-60.7]	167
65+	9.9	[5.2-17.9]	90.1	[82.1-94.8]	91
Total	**50.4**	**[48.1-52.6]**	**49.6**	**[47.4-51.9]**	**1,964**

	Yes		No		Total
Variable	**%**	**95% CI**	**%**	**95% CI**	**N**
District					
Fezile Dabi	40.3	26.1-56.3	58.2	43.7-73.9	470
Lejweleputswa	23.4	14.1-35.5	76.6	[73.0-79.8]	585
Mangaung	81.8	[77.5-85.5]	18.2	[14.5-22.5]	358
Thabo Mofutsanyane	66.4	[61.8-70.8]	33.6	[29.2-38.2]	426
Xhariep	65.4	[57.6-72.4]	34.6	[27.6-42.4]	156
Total	**50.3**	**41.1-59.5**	**49.7**	**40.5-58.9**	**1 995**

*CI: Confidence Interval: Subtotals or averages for the Province are not always equal given the non-response or missing data.

5.1.6 Discussion

It is always important to give the context of the demographic characteristics of the current study population in relation to other recent nationally representative surveys. For those aged 20 years and older, 5.2% of household members did not have any form of schooling compared to the 2.6% in 2020, while 23.1% had matric education compared to 36.3% in 2020 (Stats SA, 2021).

The unemployment rate for household heads and members who were economically active from the current study was 54.0% and 68.7%, which is higher than the provincial official unemployment rate from the third quarter of the Quarterly Labour Force Survey in 2021, which was 38.1% (QLFS, 2021). This is probably because the survey was also able to capture people who are unemployed but not entirely looking for work.

According to the General Household Survey, a larger percentage of households received grants compared to salaries as a source of income in Free State Province (60.2% versus 49.0%) in 2020. A similar pattern is noticed in the current study as the majority (36.7%) of household heads and 42.6% of household members relied on social welfare grants (including old age grant) as their source of income, followed by those who relied on salaries with 35.2% and 16.5% for household heads and members, respectively. The provincial average of 37.6% of household members reported receiving social grants is in line with the Free State average for the household population of 38.9% and 39.1% in 2016 and 2020, respectively (SADHS, 2016; Stats SA, 2021). In terms of grant type, the child support grant was the most common type of grant, with 51.6% of household members receiving this grant. Although this was also the case in 2016, the percentage of the household population that received child grants in this province was lower, at 26.2% (SADHS, 2016). Unsurprisingly, children and the elderly were more likely than other age groups to receive any type of grants. In terms of the COVID-19 grant, 50.8% of household members were reported as having received this grant in Free State in the current study. This is higher than the provincial average of 4.8% of individuals who accessed the COVID-19 grants in 2020 (Stats SA, 2021). The reason behind this might be that the grant was being gradually rolled out as the pandemic was progressing. In addition, for 2020 statistics, only those aged 18 years and older were counted, whereas all household members were included in the current study.

5.2 Dwellings and Services

5.2.1 Housing types

Findings from the Free State Province show that the most common dwelling type occupied by households was described as a formal dwelling/house or brick/concrete block structure on a separate stand or yard or on a farm (77.1%) (Table 20). The second most common dwelling type was an informal dwelling/shack not in a backyard (8.2%). About 4.3% of the households reported living in informal dwellings/shacks in the backyard and 0.3% highlighted dwelling in a room/apartment on a property or an apartment in a larger dwelling, servants' quarters/granny.

Table 20: Types of dwellings occupied by households

Dwelling type (n=1559)	Number (n)	Percentage (%)
Formal dwelling/ House or brick/concrete block structure on a separate stand or yard or on a farm	2,243	77.1
Informal dwelling/Shack not in backyard	244	8.2
Formal dwelling /House/ Flat/Room in backyard	171	5.8
Informal dwelling/Shack in backyard	119	4.3
Flat or apartment in a block of flats	69	2.4
Traditional dwelling/Hut/Structure made of traditional materials	44	1.7
Room/Apartment on a property or an apartment in a larger dwelling, servants quarters/granny	9	0.3
Other	6	0.2

5.3 Access to Water Service

5.3.1 Households main source of drinking water

Table 21 shows that the predominant source of drinking water in the Free State Province was tap water in the yard, making up 53.8 % of all water sources (Table 21). Tap water in dwelling/house were the second most common drinking water source for households. Only 34.5% of the households had access to public/ communal tap (Table 21). Boreholes accounted for 1.7% of all water sources. About 0.4% of the household's main source of drinking water was from water vendors and none sourced their drinking water from spring or stagnant water/dam/pool (Table 21).

Table 21: Main source of drinking water

Main source of drinking water (n= 1585)	Number (n)	Percentage (%)
Piped (tap) water in the yard	1,561	53.8
Piped (tap) water in dwelling/house	994	34.5
Public/communal tap	82	3.0
Borehole in yard	72	2.3
Water-carrier/tanker	74	2.1
Borehole outside yard	60	1.7
Neighbours tap	38	1.6
Water vendor (charge involved)	12	0.4
Other	10	0.4
Flowing water/stream/river	3	0.1
Spring	1	0.0
Stagnant water/dam/pool	2	0.0

Table 22 shows the main source of drinking water by the sex of household head and district. There is almost an equal distribution between both genders. Lejweleputswa District (44.1%) had the highest proportion of households using tap water inside dwelling/house as the main source of drinking water, followed by Fezile Dabi District (41.9%) and Mangaung District (63%) had the highest proportion of households using tap water in the yard, closely followed by Thabo Mofutsanyane District (60.2%), while Lejweleputswa District (49.3%) had the least. Fezile Dabi District (3.8%) had the highest proportion of the households using drinking water from the public/communal taps, followed by Thabo Mofutsanyane (3.4%).

Nearly 92% of households reported that they were supplied with water by the municipality (Figure 8). Moreover, 4.4% were not supplied with water by the scheme.

Table 22: Households main source of water by sex of household head and districts

		Household head sex		Districts				
		Male	Female	Xhariep	Lejwele-putswa	Thabo Mofutsan-yane	Fezile Dabi	Mangaung
Piped (tap) water in dwelling/ house	%	32.6	36.8	26.7	44.1	26.9	41.9	30.1
	95% CI	[27.8-37.8]	[31.8-42.0]	[20.5-33.9]	[36.2-52.3]	[18.9-36.8]	[34.0-50.3]	[20.8-41.5]
Piped (tap) water in yard	%	53.3	54.4	58.4	49.3	60.2	35.4	63
	95% CI	[48.0-58.6]	[49.1-59.5]	[48.6-67.6]	[41.5-57.3]	[50.5-69.1]	[28.9-42.4]	[51.9-72.9]
Borehole in yard	%	4	0.4	4.5	2.3	0.7	5.8	1.3
	95% CI	[2.2-7.3]	[0.1-1.1]	[2.0-9.7]	[0.4-12.9]	[0.3-1.9]	[2.2-14.5]	[0.4-4.4]
Neighbours tap	%	1.7	1.3	1.2	1.5	2.6	0.2	1.5
	95% CI	[0.9-3.3]	[0.7-2.5]	[0.6-2.6]	[0.4-4.7]	[1.2-5.5]	[0.0-1.3]	[0.6-3.8]
Public/ communal tap	%	2.8	3.2	2	1.7	3.4	3.8	3.3
	95% CI	[1.5-5.3]	[1.6-6.2]	[0.5-7.0]	[0.4-6.5]	[1.2-9.3]	[0.8-16.6]	[0.8-12.2]
Water-carrier/ tanker	%	2	2.2	2.7	0	3.6	4.7	0.6
	95% CI	[1.1-3.6]	[0.9-5.5]	[0.5-13.0]		[1.0-12.0]	[2.2-10.0]	[0.1-3.9]
Water vendor (charge involved)	%	0.3	0.6	0.2	0.6	0.2	1.1	0.2
	95% CI	[0.1-0.9]	[0.2-1.3]	[0.0-1.1]	[0.2-1.8]	[0.0-1.1]	[0.3-3.5]	[0.0-1.3]
Borehole outside yard	%	2.6	0.6	3.7	0.5	1.1	6.3	0
	95% CI	[1.4-5.1]	[0.3-1.4]	[1.4-9.4]	[0.1-3.2]	[0.3-3.8]	[2.7-14.0]	
Flowing water/ stream/ river	%	0.1	0.1	0.2	0	0.3	0	0
	95% CI	[0.0-0.6]	[0.0-0.6]	[0.0-1.2]		[0.1-1.2]		
Stagnant water/ dam/ pool	%	0	0	0.3	0	0	0	0
	95% CI	[0.0-0.1]	[0.0-0.1]	[0.0-2.2]				
Spring	%	0.1	0	0	0	0.1	0	0
	95% CI	[0.0-0.5]				[0.0-0.9]		
Other	%	0.4	0.4	0.2	0.1	0.8	0.8	0
	95% CI	[0.1-1.4]	[0.2-1.0]	[0.0-1.1]	[0.0-1.0]	[0.2-2.7]	[0.3-1.9]	

*CI: Confidence Interval: Subtotals or averages for the Province are not always equal given the non-response or missing data

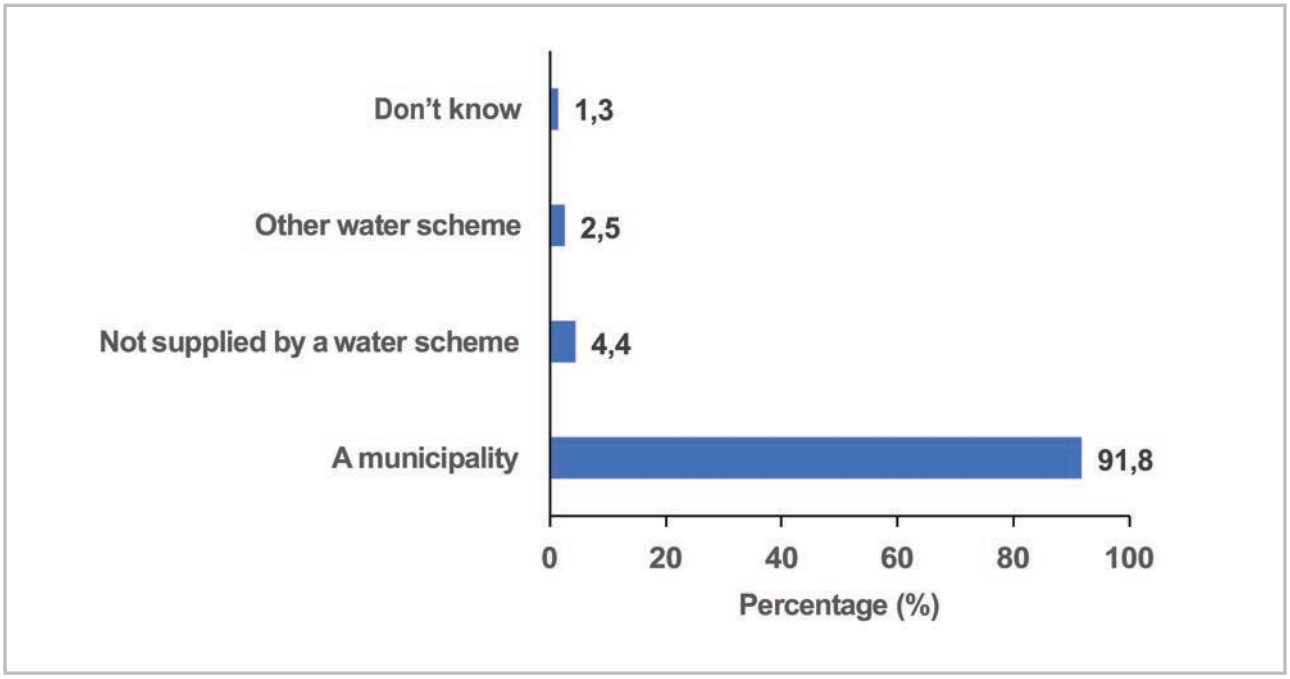


Figure 8: *Water supplier*

5.3.2 Payment for water services

Of those households that reported the municipality as the supplier of their main source of drinking water, about only 31.9% of households paid for it (Figure 9). A comparison of the payment of water services by the district showed that Fezile Dabi District had the highest proportion of the households that paid for their water services (36.4%), closely followed by Lejweleputswa District (36.1%) while Xhariep District (76.4%) had the highest proportion of those who did not pay (Table 23). The findings also highlighted that more male-headed households (34.3%) pay for water services than female-headed households 29%.

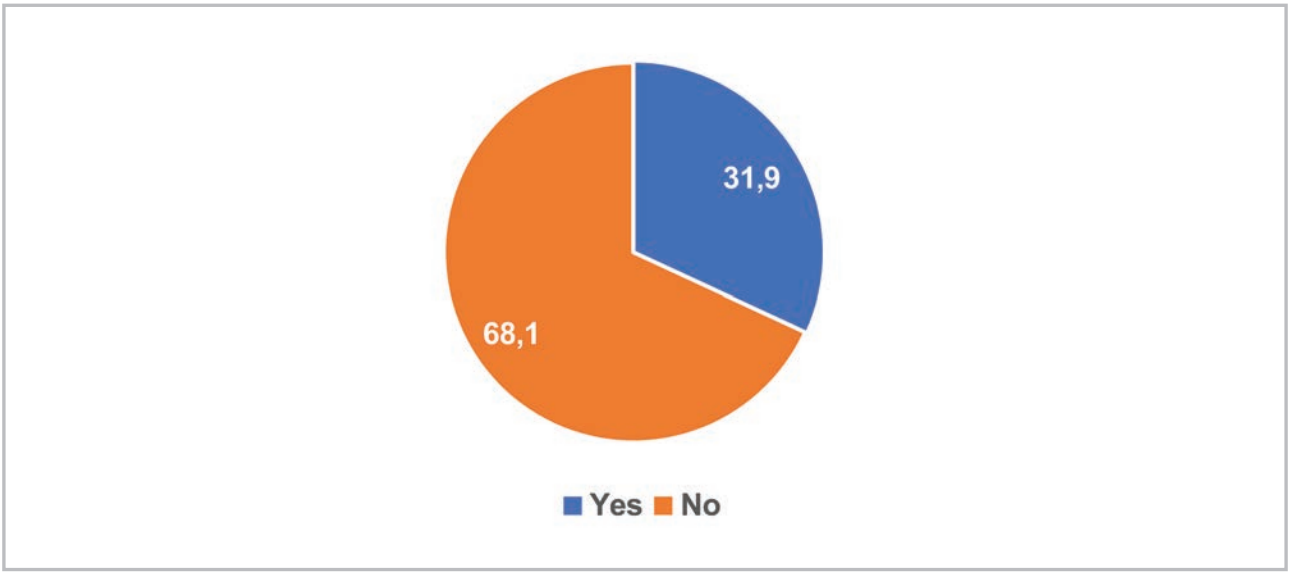


Figure 9: *Payment of water services (n=2896)*

Table 23: Payment of water services by district and household head sex

	Yes		No	
	%	95% CI	%	95% CI
Household head sex				
Male	34.3	[29.1-40.0]	65.7	[60.0-70.9]
Female	29	[24.0-34.7]	71	[65.3-76.0]
District				
Xhariep	23.6	[18.3-29.9]	76.4	[70.1-81.7]
Lejweleputswa	36.1	[26.3-47.3]	63.9	[52.7-73.7]
Thabo Mofutsanyane	25.3	[16.7-36.3]	74.7	[63.7-83.3]
Fezile Dabi	36.4	[26.4-47.9]	63.6	[52.1-73.6]
Mangaung	33.5	[24.6-43.8]	66.5	[56.2-75.4]

5.4 Sanitation and Hygiene

Table 24 shows the types of toilet facilities used by the Free State Province households. Flush toilet connected to a public sewerage system were the most common toilet facility used by the households, accounting for 68.6% of all toilet types (Table 24). About 5.7% used pit latrine/toilet with a ventilation pipe, with 0.1% using chemical toilets.

Table 24: Type of toilet facility used by households

Type of toilet facility (n=1 559)	Number (n)	Percentage (%)
Flush toilet connected to a public sewerage system	2,053	68.6
Pit latrine/toilet without ventilation pipe	485	18.1
Pit latrine/toilet with a ventilation pipe	163	5.7
Bucket toilet (collected by municipality)	64	2.7
Flush toilet connected to a septic or conservancy tank	50	1.9
Open defecation (e.g., no facilities, field, bush)	47	1.8
Bucket toilet (emptied by household)	15	0.7
Other	9	0.3
Pour flush toilet connected to a septic tank or (septage pit)	8	0.3
Chemical toilet	2	0.1

Lejweleputswa District (79%) had the highest proportion of households using flush toilets connected to a public sewerage system, followed by Xhariep District (73.5%) (Table 25). The highest proportion of households practicing open defecation was in Lejweleputswa District (4.4%). Mangaung District (9%) had the highest proportion of households using pit latrine/toilet with ventilation pipe, while Thabo Mofutsanyane District had the highest proportion of pit latrine/toilet without ventilation pipe (28.4%). There was a high number of female-headed households (70.7%) using distribution using flush toilet connected to a public sewerage system than male headed households (66.9%).

Table 25: Type of toilet facility used by the households by sex of the household head and district

		Household head sex		District				
		Male	Female	Xhariep	Lejwele-putswa	Thabo Mofutsan-yane	Fezile Dabi	Mangaung
Flush toilet connected to a public sewerage system	%	66.9	70.7	70.4	79	54.9	73.5	69.7
	95% CI	[58.6-74.2]	[62.2-77.9]	[56.0-81.6]	[60.6-90.3]	[38.2-70.5]	[57.2-85.2]	[54.6-81.4]
Flush toilet connected to a septic or conservancy tank	%	2	1.7	4.6	0.4	3.5	2.2	0.6
	95% CI	[1.2-3.2]	[1.0-3.0]	[1.8-11.1]	[0.1-1.6]	[1.9-6.4]	[1.2-4.2]	[0.2-1.9]
Pour flush toilet connected to a septic tank (or septage pit)	%	0.4	0.1	0.3	0.4	0.2	0.6	0
	95% CI	[0.2-0.9]	[0.0-0.7]	[0.1-1.3]	[0.1-1.5]	[0.0-1.2]	[0.2-1.9]	
Chemical toilet	%	0.1	0	0.2	0	0	0	0.2
	95% CI	[0.0-0.5]		[0.0-1.2]				[0.0-1.2]
Pit latrine/ toilet with a ventilation pipe	%	6.1	5.1	7.5	2.7	6.5	2.9	9
	95% CI	[4.3-8.6]	[3.5-7.4]	[3.6-15.2]	[1.0-7.6]	[3.7-11.2]	[1.2-6.8]	[5.5-14.4]
Pit latrine/ toilet without ventilation pipe	%	18.9	17	13.9	11.2	28.4	15.2	16.4
	95% CI	[13.9-25.3]	[11.8-23.9]	[7.3-24.8]	[4.5-25.2]	[16.8-43.9]	[7.3-28.8]	[9.0-27.9]
Bucket toilet (collected by municipality)	%	2.1	3.3	0	0.3	4.4	3.3	3.1
	95% CI	[1.1-4.1]	[1.7-6.3]		[0.0-1.9]	[1.5-12.1]	[0.8-12.5]	[1.2-8.3]
Bucket toilet (emptied by household)	%	0.3	1.2	0.2	0.8	1.1	0.6	0.5
	95% CI	[0.1-0.9]	[0.5-2.8]	[0.0-1.1]	[0.2-3.4]	[0.3-3.9]	[0.1-2.4]	[0.1-2.2]
Open defecation (e.g., no facilities, field, bush)	%	2.9	0.5	2.9	4.4	1	1	0.4
	95% CI	[1.3-6.3]	[0.2-1.2]	[1.4-6.3]	[1.3-13.6]	[0.3-3.2]	[0.4-2.6]	[0.1-2.5]
Other	%	0.3	0.4	0	0.8	0	0.6	0.2
	95% CI	[0.1-0.9]	[0.1-1.2]		[0.3-2.0]		[0.1-2.6]	[0.0-1.3]

*CI: Confidence Interval: Subtotals or averages for the Province are not always equal given the non-response or missing data

Types of toilet facilities used by households were further divided into 'improved' and 'unimproved' based on the WHO & UNICEF Joint Monitoring Programme (JMP) definition. Improved toilets include flushed or flushed to septic tanks, piped sewer systems, pit latrines, VIP latrines, and pit latrines with slabs. REf (WHO, 2017) Meanwhile, unimproved toilets consist of shared facilities or none (bush or field); flush toilets or pour-flush toilets that go elsewhere (not to septic tanks or pit latrines); pit latrines without slabs; bucket systems; and hanging toilets REf: (WHO and UNICEF, 2017). Most of the households in Free State Province used improved toilets, with Xhariep District having the highest proportion (96.9%) followed by Mangaung District (95.8%) (Figure 10).

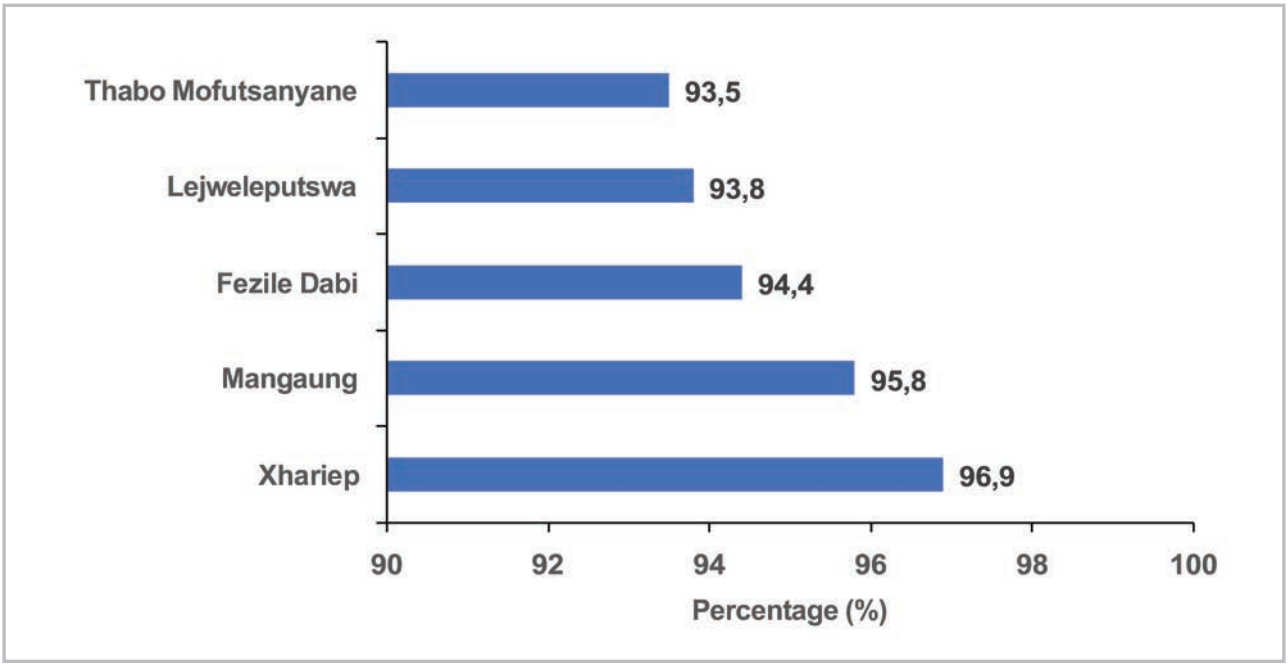


Figure 10: *Proportion of households paying for public sewerage (n=2701)*

Figure 11 shows that most households (77.6%) do not pay for sewage, and only 19.3% indicated that they pay for sewage, 3.1% reported that they do not know whether it is paid or not. When asked whether the households receive free sanitation as part of the South African Government's free basic services policy, about 65.2 % indicated they were not receiving free sanitation, only 30.7% of households reported to be receiving free sanitation services (Figure 12).

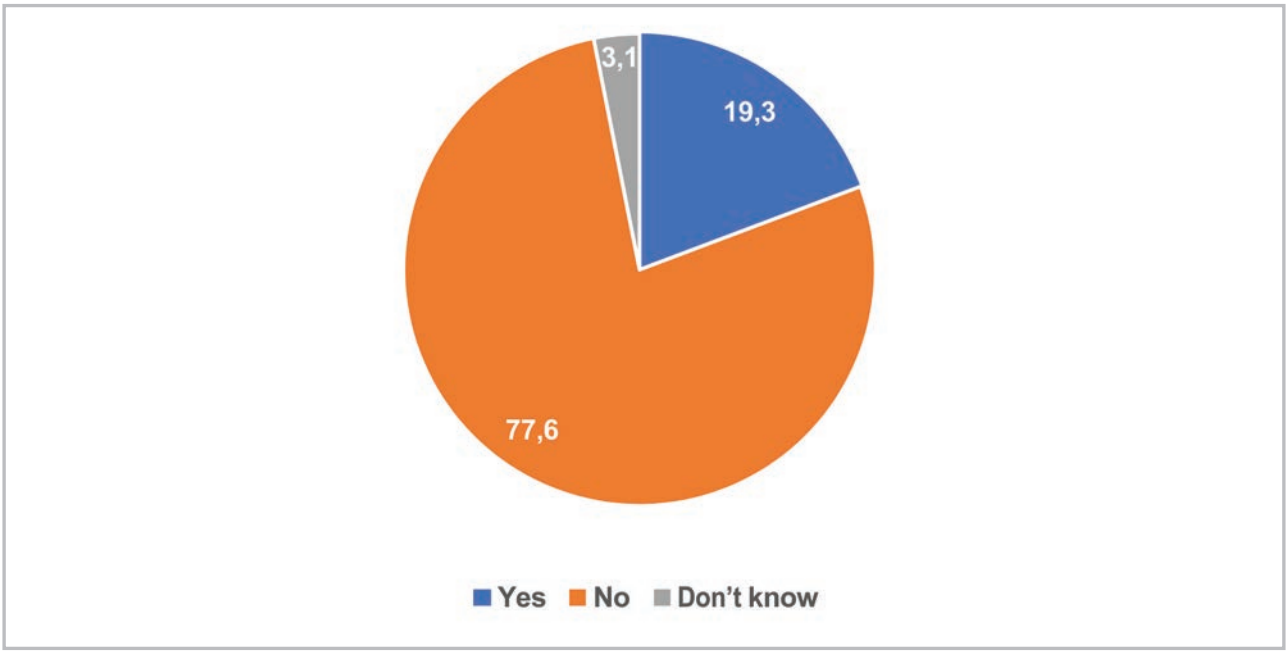


Figure 11: *Proportion of households paying for public sewerage (n=2701)*

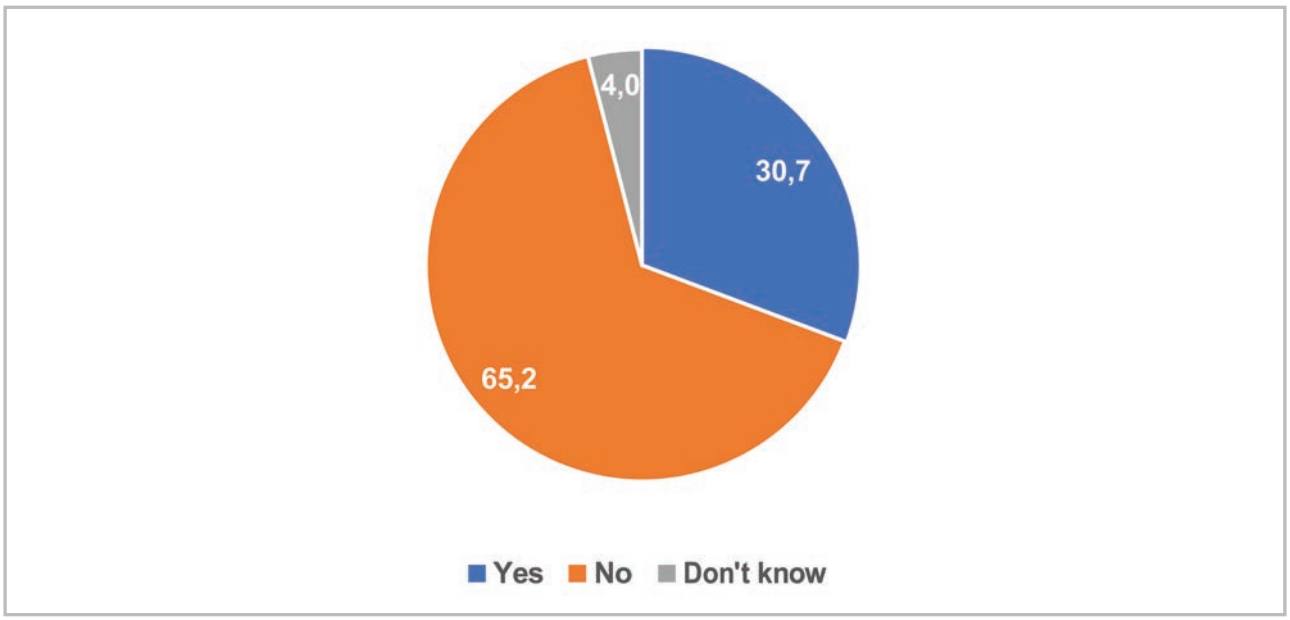


Figure 12: *Proportion of households receiving free sanitation services (n=2049)*

Most female-headed households (31.7%) indicated to have received free sanitation, whilst 65.8% of male-headed households did not receive free sanitation. Thabo Mofutsanyane (38.3%) district had the highest proportion of households receiving free sanitation services, while Lejweleputswa District (23.3 %) had the least of households receiving free sanitation (Table 26).

Table 26: Households receiving free sanitation by sex of the household head and district

	Yes		No		Don't know		Total (n)
	%	95% CI	%	95% CI	%	95% CI	
Household head sex							
Male	29.8	[25.5-34.5]	65.8	[61.4-69.9]	4.4	[2.9-6.6]	241
Female	31.7	[27.0-36.8]	64.7	[59.6-69.5]	3.6	[2.2-5.8]	257
District							
Xhariep	31.4	[23.3-40.9]	67.8	[58.3-76.0]	0.8	[0.3-2.2]	294
Lejweleputswa	23.3	[18.9-28.4]	74.4	[69.5-78.8]	2.3	[1.2-4.2]	
Thabo Mofutsanyane	38.3	[30.0-47.4]	57.4	[47.3-66.9]	4.3	[2.1-8.5]	114
Fezile Dabi	29.7	[24.6-35.4]	63.7	[57.8-69.2]	6.6	[4.5-9.7]	91
Mangaung	33	[23.1-44.6]	62.4	[52.6-71.3]	4.6	[1.7-11.7]	

5.4.1 Refuse removal

Table 27 shows rubbish disposal methods used by households in Free State Province. The majority of households have their refuse removed by local authority/private company at least once a week, 42.2%, followed by 18.3% of households who dump or leave rubbish anywhere (Table 27). Few households reported having rubbish removed by community members at least once a week (0.3%).

Table 27: Household rubbish disposal

Rubbish disposal method (n=1511)	Number (n)	Percentage (%)
Removed by local authority/private company at least once a week	1 222	42.2
Dump or leave rubbish anywhere	520	18.3
Own refuse dump	406	14.7
Removed by community members, contracted by municipality at least once a week	279	8.7
Communal refuse dump	162	5.8
Removed by local authority/private company less often than once a week	87	3.4
Removed by community members, contracted by municipality less than once a week	81	2.7
Communal container/central collection point	42	1.6
Other	34	1.2
Removed by community members, less often than once a week	29	1.0
Removed by community members at least once a week	9	0.3

Table 28 shows that a higher proportion of female-headed households have their disposal removed by local authority/private company at least once a week (45%). Xhariep District had the highest proportion of the households that uses their own refuse dump (20.1%), while Fezile Dabi District had the least households of who disposed their own refuse (8.5%). Thabo Mofutsanyane District (22.6%) had the highest proportion of households who dump or leave rubbish anywhere, while Fezile Dabi District (10.3%) had the least. More than half (57.8%) of the households indicated that they were not receiving free refuse removal services, whilst 39.7% of households received free refuse removal services (Figure 13).

Table 28: Households rubbish disposal methods by sex of the household head and district

		Household head sex		Districts				
		Male	Female	Xhariep	Lejwele-putswa	Thabo Mofutsan-yane	Fezile Dabi	Mangaung
Removed by local authority/ private company at least once a week	%	39.7	45	34.8	38.1	37.4	61.5	39.3
	95% CI	[33.8-45.9]	[38.3-51.9]	[26.2-44.4]	[27.6-49.9]	[24.5-52.5]	[48.1-73.4]	[30.8-48.5]
Removed by local authority/ private company less often than once a week	%	3.5	3.3	0.9	7.3	2.2	3.3	1.7
	95% CI	[2.2-5.7]	[2.0-5.3]	[0.4-1.9]	[3.5-14.6]	[0.9-5.0]	[1.6-6.8]	[0.8-3.6]
Removed by community members, contracted by municipality at least once a week	%	8.4	9.1	12	7.4	8.2	9.6	9.2
	95% CI	[6.4-10.9]	[7.0-11.7]	[7.4-18.9]	[4.6-11.6]	[5.1-13.0]	[5.9-15.1]	[5.5-15.2]
Removed by community members, contracted by municipality less than once a week	%	2.5	2.8	2.6	4.5	2.5	1.5	1.9
	95% CI	[1.5-4.1]	[1.9-4.3]	[1.2-5.3]	[2.3-8.5]	[1.1-5.8]	[0.7-3.2]	[0.8-4.1]
Removed by community members at least once a week	%	0.3	0.3	0.4	0.2	0.1	0.2	0.8
	95% CI	[0.1-1.1]	[0.1-0.8]	[0.1-1.4]	[0.0-1.1]	[0.0-1.0]	[0.0-1.2]	[0.2-3.3]
Removed by community members, less often than once a week	%	1.1	0.8	2	0.3	1.7	0.4	1.2
	95% CI	[0.6-2.3]	[0.4-1.6]	[0.6-6.5]	[0.1-1.1]	[0.6-4.6]	[0.1-1.7]	[0.3-4.2]
Communal refuse dump	%	6.6	4.9	6.7	8.8	5.2	2.6	5.7
	95% CI	[4.7-9.2]	[3.4-7.2]	[4.3-10.2]	[5.1-14.8]	[2.8-9.3]	[1.1-5.8]	[3.1-10.2]
Communal container/central collection point	%	2.2	0.9	0.4	1.3	0.4	0.9	4
	95% CI	[1.0-4.9]	[0.5-1.7]	[0.1-1.6]	[0.5-3.3]	[0.1-1.8]	[0.4-2.2]	[1.4-10.8]
Own refuse dump	%	15.9	13.4	20.1	8.9	19.1	8.5	18.8
	95% CI	[12.5-19.9]	[9.6-18.5]	[12.4-30.7]	[5.0-15.4]	[12.2-28.7]	[4.0-17.1]	[12.2-27.8]
Dump or leave rubbish anywhere	%	18.1	18.6	19.5	20.2	22.6	10.3	17.3
	95% CI	[14.4-22.5]	[14.0-24.4]	[12.5-29.3]	[13.3-29.5]	[13.3-35.6]	[4.9-20.1]	[11.7-24.9]
Other	%	1.7	0.7	0.8	3	0.6	1.3	0.2
	95% CI	[1.0-2.7]	[0.3-1.3]	[0.2-2.8]	[1.9-4.8]	[0.2-1.9]	[0.5-3.4]	[0.0-1.3]

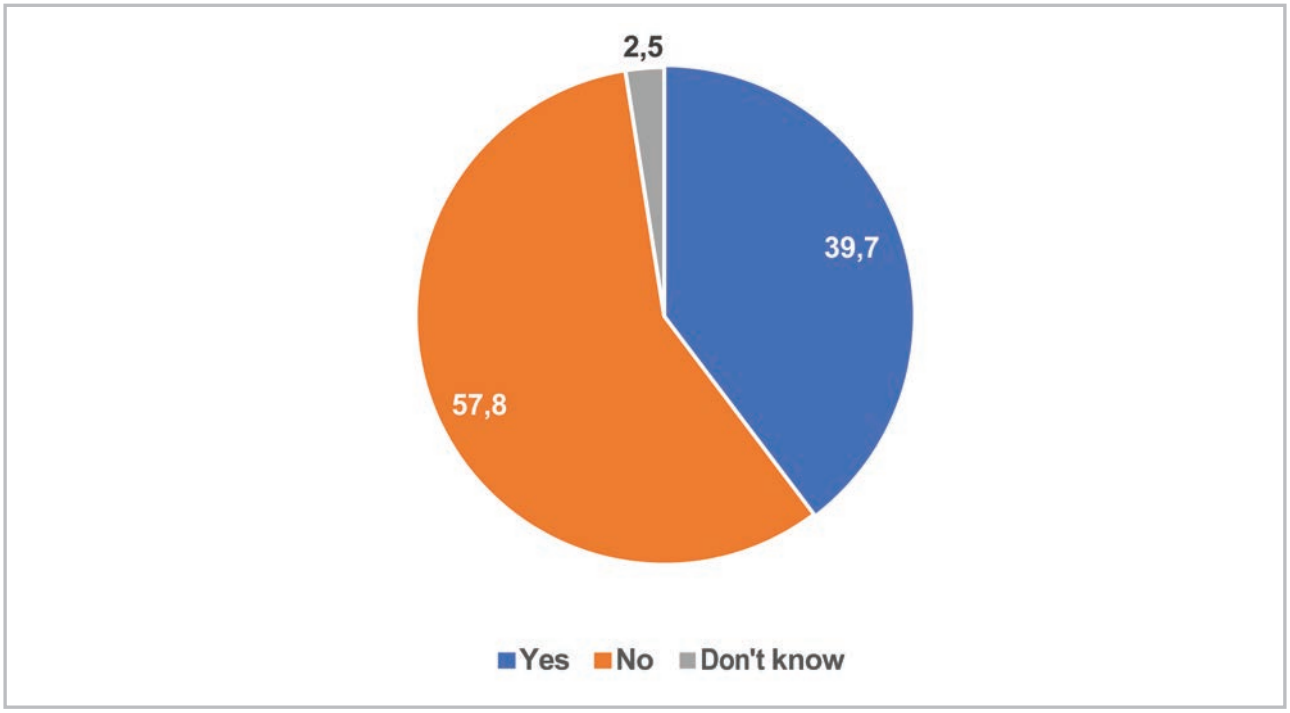


Figure 13: *Proportion of households receiving free refuse removal services (n=1,705)*

5.5 Energy

5.5.1 Access to electricity

Figure 14 shows that the majority of households in Free State indicated that they had access to electricity (89.6%). Table 29 shows that more female-headed household (91.3%) had access to electricity than male-headed households (88.1%). Mangaung District (92.3%) and Lejweleputswa District (89.5%) had the highest proportion of households with access to electricity, whilst Fezile Dabi (87%) and Xhariep (87.2%) districts had the lowest proportion of households with access to electricity.

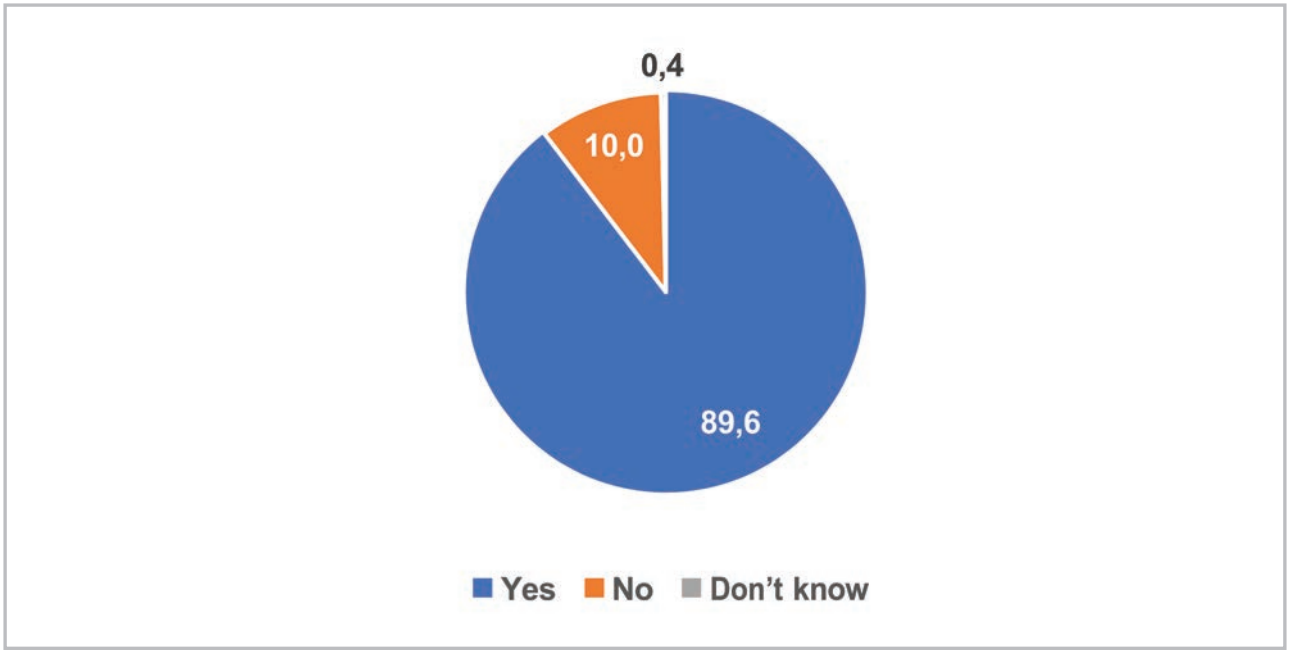


Figure 14: *Proportion of households with access to electricity (n=2 909)*

Table 29: Access to electricity by household sex and district

	Yes		No		Don't know	
	%	95% CI	%	95% CI	%	95% CI
Household head sex						
Male	88.1	[83.9-91.4]	11.4	[8.2-15.6]	0.5	[0.2-1.1]
Female	91.3	[86.7-94.4]	8.5	[5.3-13.1]	0.2	[0.1-0.7]
District						
Xhariep	87.2	[77.8-93.0]	12.7	[7.0-21.8]	0.1	[0.0-0.8]
Lejweleputswa	89.5	[79.3-95.0]	9.7	[4.3-20.3]	0.8	[0.3-2.3]
Thabo Mofutsanyane	89.3	[78.1-95.1]	10.3	[4.5-21.8]	0.4	[0.1-1.6]
Fezile Dabi	87	[76.4-93.3]	12.8	[6.6-23.5]	0.1	[0.0-1.0]
Mangaung	92.3	[85.6-96.0]	7.5	[3.8-14.3]	0.1	[0.0-1.0]

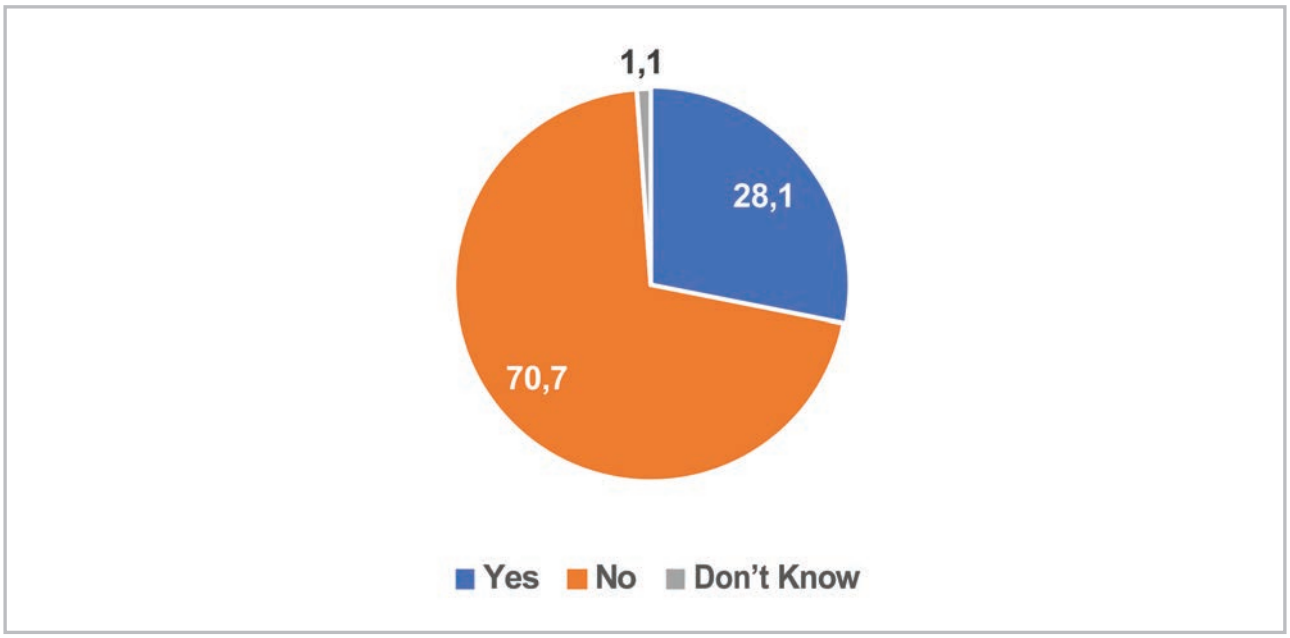


Figure 15: *Proportion of households receiving free electricity (n=2605)*

Figure 15 shows that only 89.6 % of the households in Free State Province indicated that they were receiving free electricity as part of the Free Basic Electricity Programme (FBE). Under this programme, qualifying households receive 50 kWh per month.

Table 30 shows households receiving free electricity disaggregated by sex of the household head and district. More female-headed households (33.6%) reported to receive free electricity than male-headed households (23.3%). Xhariep District had the highest proportion of households who were not receiving free electricity (74.4%), followed by Mangaung District (73.5%), while Fezile Dabi District had the highest proportion of households who were receiving free electricity by district least (33.1%).

Table 30: Households receiving free electricity by sex of the household head and district

	Yes		No		Don't know	
	%	95% CI	%	95% CI	%	95% CI
Household head sex						
Male	23.3	[19.7-27.4]	74.8	[70.6-78.5]	2	[0.9-4.2]
Female	33.6	[28.8-38.7]	66.2	[61.1-71.0]	0.2	[0.1-0.8]
District						
Xhariep	25.1	[18.7-32.8]	74.4	[66.6-80.9]	0.5	[0.2-1.5]
Lejweleputswa	26.1	[18.5-35.5]	73	[64.0-80.4]	0.9	[0.3-3.1]
Thabo Mofutsanyane	31.2	[23.5-40.0]	68.5	[59.5-76.2]	0.3	[0.1-1.3]
Fezile Dabi	33.1	[23.2-44.8]	65.9	[54.5-75.7]	1	[0.4-2.6]
Mangaung	24.1	[19.5-29.4]	73.5	[67.8-78.5]	2.4	[0.7-8.4]

5.5.2 Energy sources for cooking, lighting, water heating, and space heating

Energy sources were categorized into cooking, lighting, water heating, and space heating (Table 31). The results show that electricity from the mains (99.1%) was the main energy source for lighting for most of the households in Free State Province. This was followed by gas (4.8%) which was the second most used energy source for cooking. Other sources of energy, such as coal, animal dung, and gas, were the main source of energy for less than 5% of the households. Paraffin (13.6%) was mainly used for space heating by Free State Province households. Table 35 shows that Lejweleputswa District (96%) had the highest proportion of households whose main source of energy for cooking was electricity from the mains, closely followed by Mangaung District (94.4%). Fezile Dabi District (7.3%) had the highest proportion of households whose main source of energy for cooking was gas, while Thabo Mofutsanyane District (2.6%) used wood as their main source of energy for cooking. There was almost an equal distribution between male- (92.1%) and female-headed households (92.5%) who used electricity from mains as the source of energy for cooking (Table 31).

Table 31: Household main source of energy for cooking, lighting, water heating, and space heating

	Cooking	Lighting	Water heating	Space heating
	%	%	%	%
Electricity from mains	92.3	99.1	93.3	48.6
Other source of electricity (Generator)	0.6	0.5	0.4	0.3
Gas	4.8	0.1	1.0	4.7
Paraffin	1.0	0.1	1.0	13.6
Wood	0.9		1.0	7.0
Coal	0.3		0.1	1.6
Solar energy	0.0	0.0	0.6	0.0
Other	0.0		0.1	

	Cooking	Lighting	Water heating	Space heating
	%	%	%	%
Candles		0.2		
None			2.7	24.1
Solar energy			0.7	0.1

Table 32: Source of energy for cooking by sex of the household head and district

		Household head sex		District				
		Male	Female	Xhariep	Lejwele-putswa	Thabo Mofutsan-yane	Fezile Dabi	Mangaung
Electricity from mains	%	92.1	92.5	94	96	88.9	88.8	94.4
	95% CI	[90.0-93.8]	[90.0-94.5]	[90.9-96.0]	[92.9-97.8]	[84.0-92.5]	[85.2-91.6]	[91.5-96.4]
Other source of electricity (e.g., generator, etc.)	%	0.5	0.6	0.4	0.3	0.2	1.4	0.6
	95% CI	[0.2-1.2]	[0.3-1.3]	[0.1-1.6]	[0.1-1.3]	[0.0-1.3]	[0.7-2.9]	[0.1-2.4]
Gas	%	5.9	3.5	3.2	3.2	6.2	7.3	3.6
	95% CI	[4.5-7.8]	[2.2-5.6]	[1.9-5.1]	[1.6-6.4]	[3.6-10.3]	[4.9-10.8]	[2.0-6.4]
Paraffin	%	0.7	1.4	1.3	0.5	1.4	1	1
	95% CI	[0.3-1.3]	[0.7-2.6]	[0.6-2.8]	[0.2-1.4]	[0.6-3.1]	[0.4-2.6]	[0.3-3.4]
Wood	%	0.4	1.6	0.8	0	2.6	0.6	0.4
	95% CI	[0.1-0.9]	[0.9-2.9]	[0.2-2.5]		[1.4-4.7]	[0.1-2.5]	[0.1-1.4]
Coal	%	0.4	0.3	0	0	0.8	0.7	0
	95% CI	[0.1-1.0]	[0.1-1.0]			[0.2-2.5]	[0.2-2.2]	
Solar energy	%	0	0	0.4	0	0	0	0
	95% CI	[0.0-0.2]		[0.1-1.6]				
Other	%	0.1	0	0	0	0	0.2	0
	95% CI	[0.0-0.5]					[0.0-1.4]	

Table 33 shows that electricity from the mains was the most common energy source for water heating in the Free State Province households, accounting for 97.6% of energy sources used for water heating in Lejweleputswa District (Table 33). None were reported to be using gas for water heating as the source of energy in Xhariep District. And only a few households reported to be using solar energy (less than 1%) as their main energy source for water heating among Free State Province households. There was almost an equal distribution between male (93.7%) and female (92.7%) headed households who used electricity from mains as the source of energy for water heating (Table 33).

Table 33: Source of energy for water heating by sex of the household head and district

		Household head sex		District				
		Male	Female	Xhariep	Lejwele-putswa	Thabo Mofutsan-yane	Fezile Dabi	Mangaung
Electricity from mains	%	93.7	92.7	95.9	97.6	88	92.6	94.7
	95% CI	[91.5-95.4]	[89.8-94.8]	[93.5-97.5]	[95.9-98.6]	[81.6-92.3]	[88.0-95.5]	[90.9-96.9]
Other source of electricity (e.g., generator, etc.)	%	0.5	0.4	0.5	0.7	0.4	0.5	0.2
	95% CI	[0.2-1.0]	[0.2-1.0]	[0.2-1.6]	[0.3-1.7]	[0.1-1.5]	[0.2-1.6]	[0.0-1.4]
Gas	%	1.5	0.4	0	0.5	1.4	1.4	0.8
	95% CI	[0.8-2.6]	[0.2-1.2]		[0.1-2.1]	[0.6-3.2]	[0.5-3.5]	[0.3-2.1]
Paraffin	%	0.8	1.2	1.3	0.2	1	0.9	1.7
	95% CI	[0.4-1.5]	[0.7-2.2]	[0.6-3.1]	[0.0-1.1]	[0.5-2.3]	[0.3-2.2]	[0.8-3.8]
Wood	%	0.7	1.3	1	0.2	2.6	0.7	0.2
	95% CI	[0.3-1.5]	[0.7-2.3]	[0.4-2.7]	[0.0-1.2]	[1.5-4.4]	[0.2-2.0]	[0.0-1.5]
Coal	%	0	0.2	0	0	0.4	0	0
	95% CI		[0.1-0.9]			[0.1-1.5]		
Solar energy	%	0.7	0.4	0.9	0.7	0	0.7	0.9
	95% CI	[0.3-1.9]	[0.1-1.1]	[0.3-2.6]	[0.2-2.0]		[0.2-2.2]	[0.2-4.0]
Other	%	0.1	0	0	0.2	0	0	0
	95% CI	[0.0-0.6]			[0.0-1.4]			
None	%	2.1	3.3	0.4	0	6.2	3.2	1.5
	95% CI	[1.0-4.2]	[1.8-6.3]	[0.1-1.4]		[2.6-14.2]	[1.3-7.9]	[0.4-5.7]

Table 34 shows that the predominant energy source for space heating was electricity from the mains, with Mangaung District being the highest (64.9%). Nearly one-third (33.2%) of the households did not use anything for space heating in Lejweleputswa District. Wood was mainly used by 15% of Fezile Dabi District for space heating. Male-headed households (50.1%) had the highest proportion of households using electricity from the mains, than female-headed households (46.9%).

Table 34: Main source of energy for space heating by sex of the household head and district

		Household head sex		District				
		Male	Female	Xhariep	Lejwele-putswa	Thabo Mofutsan-yane	Fezile Dabi	Mangaung
Electricity from mains	%	50.1	46.9	60.8	32.5	53.4	35.4	64.9
	95% CI	[44.9-55.2]	[41.5-52.4]	[51.4-69.4]	[27.6-37.9]	[43.8-62.8]	[30.5-40.6]	[54.7-73.8]
Other source of electricity (e.g., generator, etc.)	%	0.2	0.3	0.2	0.3	0.2	0.2	0.4
	95% CI	[0.1-0.8]	[0.1-0.9]	[0.0-1.1]	[0.0-1.8]	[0.0-1.2]	[0.0-1.3]	[0.1-1.4]
Gas	%	5.9	3.5	3.2	6.4	2.7	8.9	2.8
	95% CI	[4.3-8.0]	[2.4-4.9]	[1.6-6.0]	[3.5-11.5]	[1.5-5.0]	[6.6-12.0]	[1.6-4.9]
Paraffin	%	8.1	5.8	5.5	6.5	8	15	1.6
	95% CI	[5.9-11.0]	[4.2-8.1]	[3.0-9.8]	[3.6-11.3]	[5.4-11.8]	[9.5-22.9]	[0.7-3.7]
Wood	%	8.1	5.8	5.5	6.5	8	15	1.6
	95% CI	[5.9-11.0]	[4.2-8.1]	[3.0-9.8]	[3.6-11.3]	[5.4-11.8]	[9.5-22.9]	[0.7-3.7]
Coal	%	1.9	1.4	0	0.3	2.6	5	0
	95% CI	[1.0-3.3]	[0.6-3.0]		[0.1-1.3]	[0.8-8.0]	[3.1-7.8]	
Solar energy	%	0	0	0.4	0	0	0	0
	95% CI	[0.0-0.2]		[0.1-1.5]				
None	%	22.7	25.8	18	33.2	23	29.1	14.7
	95% CI	[18.5-27.4]	[21.2-31.0]	[10.1-30.1]	[27.3-39.8]	[15.0-33.4]	[22.9-36.3]	[7.7-26.4]

5.6 Indigent Households

In response to the question' Is this household registered on the indigent register with a local municipality?' 52% of the households responded 'yes' (Figure 16). About 2.6% did not know if the household was registered or not.

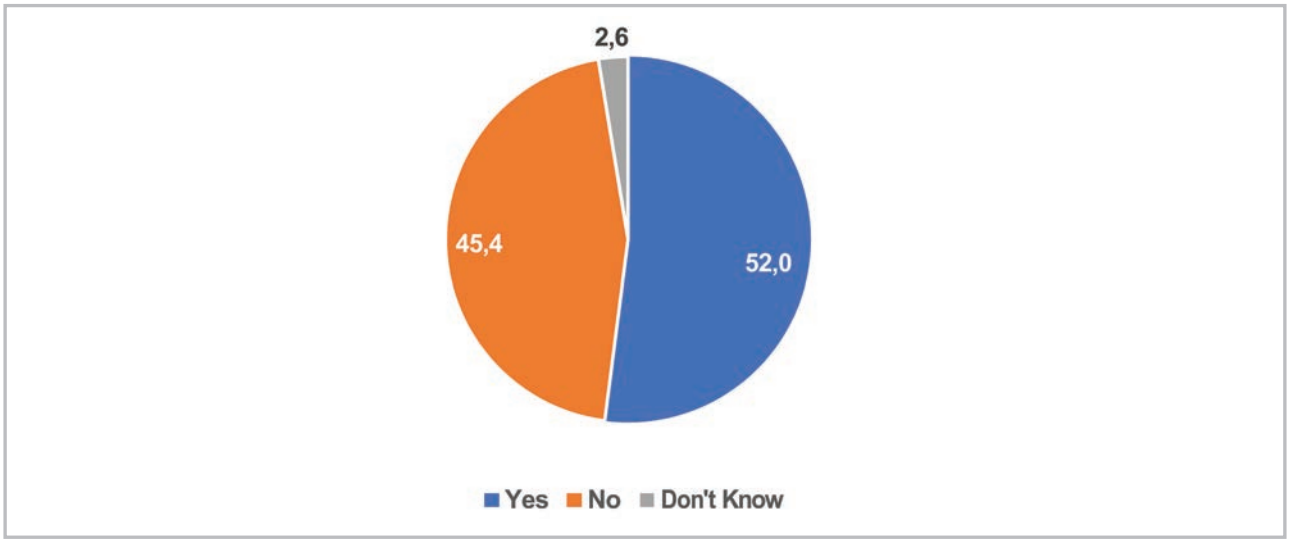


Figure 16: *Proportion of the household registered as indigent (n=2909)*

A higher proportion of female-headed households (57.4%) were registered as indigent households (Table 35). Mangaung District (61.2%) had the highest proportion of households that indicated that they were registered as indigent households, followed by Xhariep District (56.5%). Lejweleputswa District had the lowest proportion of households registered as indigent (43.6%).

Table 35: Households registered as indigent by sex of the household head and district

	Yes		No		Don't know	
	%	95% CI	%	95% CI	%	95% CI
Household head sex						
Male	47.5	[41.5-53.5]	50	[44.1-55.8]	2.5	[1.6-4.0]
Female	57.4	[52.1-62.4]	40	[35.1-45.1]	2.7	[1.6-4.5]
District						
Xhariep	56.5	[44.4-67.9]	41.5	[30.4-53.5]	2	[0.7-5.5]
Lejweleputswa	43.6	[34.2-53.5]	54.8	[45.6-63.7]	1.6	[0.6-4.1]
Thabo Mofutsanyane	55.4	[47.3-63.2]	41.6	[34.0-49.5]	3.1	[1.8-5.1]
Fezile Dabi	44.1	[33.2-55.6]	52.5	[42.3-62.5]	3.4	[1.8-6.3]
Mangaung	61.2	[48.1-72.8]	36.1	[24.6-49.6]	2.7	[0.8-8.6]

6 Agriculture

6.1 Agriculture and Production Systems Households

This section focuses on the food availability dimension of food security, which tries to unpack how food is produced within the province by various households. Many households in the African context rely on agriculture as the primary source of food, hence they engage in crop and livestock production to provide food for their households. This section characterises land ownership and access, and agriculture production trends across the different districts.

Activity	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Land preparation (maize)												
Planting (maize)												
Weeding (maize)												
Harvesting (maize)												
Land preparation (Vegetables)												
Planting (Vegetables)												
Weeding (Vegetables)												
Harvesting (vegetables)												
Off-farm Employment (CWP)												
Livestock sales												

Figure 17: *Seasonal calendar*

Findings from the HEA focus group discussions indicate that agricultural production and value chains have a critical role in household food and nutrition security. Figure 17 depicts a seasonal calendar in Free State Province. The rain season (September to February) is characterised by land preparation, planting, and weeding. Much of the rural life in the zone is still determined by agricultural seasons, although this has been ameliorated by employment, mining, and social grants, which are year-round contributors to people's livelihoods. Livelihoods information is organised temporally by consumption year, which begins with the start of the main dry harvest and runs through to just before the next year's main dry harvest. The main dry harvest begins in May, so the consumption year begins that month and runs up until the end of the following April. The livelihood strategies presented in this document apply to a particular year, one that is neither very good nor bad but is 'typical', or occurs frequently.

The main season for farming begins with land preparation in spring, followed by ploughing and planting, depending on the timing of the rains. Weeding (a period of intense activity and one in which work opportunities increase) takes place from December to April, with the dry harvest (another period for employment) beginning in April. The two main crops grown during this period are maize and groundnuts.

Wild foods are collected in all but a few months, while fruit is harvested and brewed from January to March.

6.1.1 Household access to land

In South Africa, there is a dual system in terms of land rights i.e., statutory law vested in the Constitution and customary law vested mostly in patrilineal tribal traditions and customs (Toulmin, 2008).

Overall, access to land by households in the Free State Province is extremely high (see Fig 18). Both Lejelweputswa and Fezile Dabi districts are the two districts in the province with the highest percentage of households who have access to land, with 89,7% and 86.5%, respectively (Figure 17). The district with the least number of households with access to land is Mangaung, sitting at 50%.

Xhariep and Thabo Mufutsayane districts have almost a similar number of households who have access to land, sitting at 68% and 61%, respectively. It should be noted that a large portion of land in Xhariep District is privately owned. Agricultural activities are so intensive in the Xhariep District, they constitute 21% of the main land use in the area. Agriculture and livestock farming is widespread across the entire district. Game, sheep, and ostrich farming dominates the agricultural landscape.

Agriculture is also a very crucial sector in the Thabo Mafutsayane District. It is not only important for food security, but it also contributes to extensive employment in the area. About 90% of the cherry fruits in South Africa are produced in this district. Other deciduous and tropical fruits are produced in the region as well. Maize is also very prominent in Thabo Mafutsayane District.

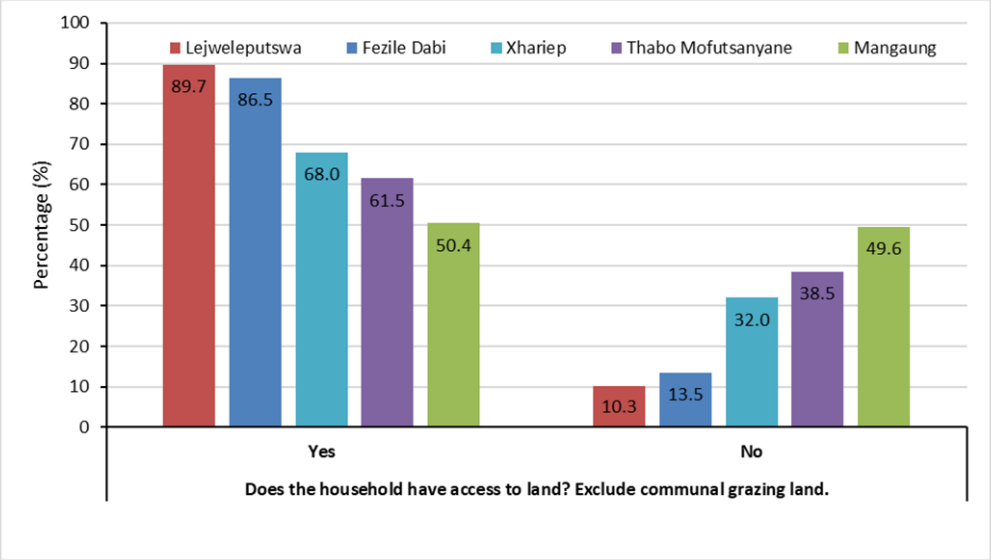


Figure 18: *Household access to land in the Free State Province*

Disaggregated by gender, both female- and male-headed households were, on average, having access to land; however, this is more pronounced among males in Xhariep and Fezile Dabi districts, with 58% of the males having access to the land. The higher number of females having access to land are in Thabo Mofutsanyane and Mangaung districts, with 52%.

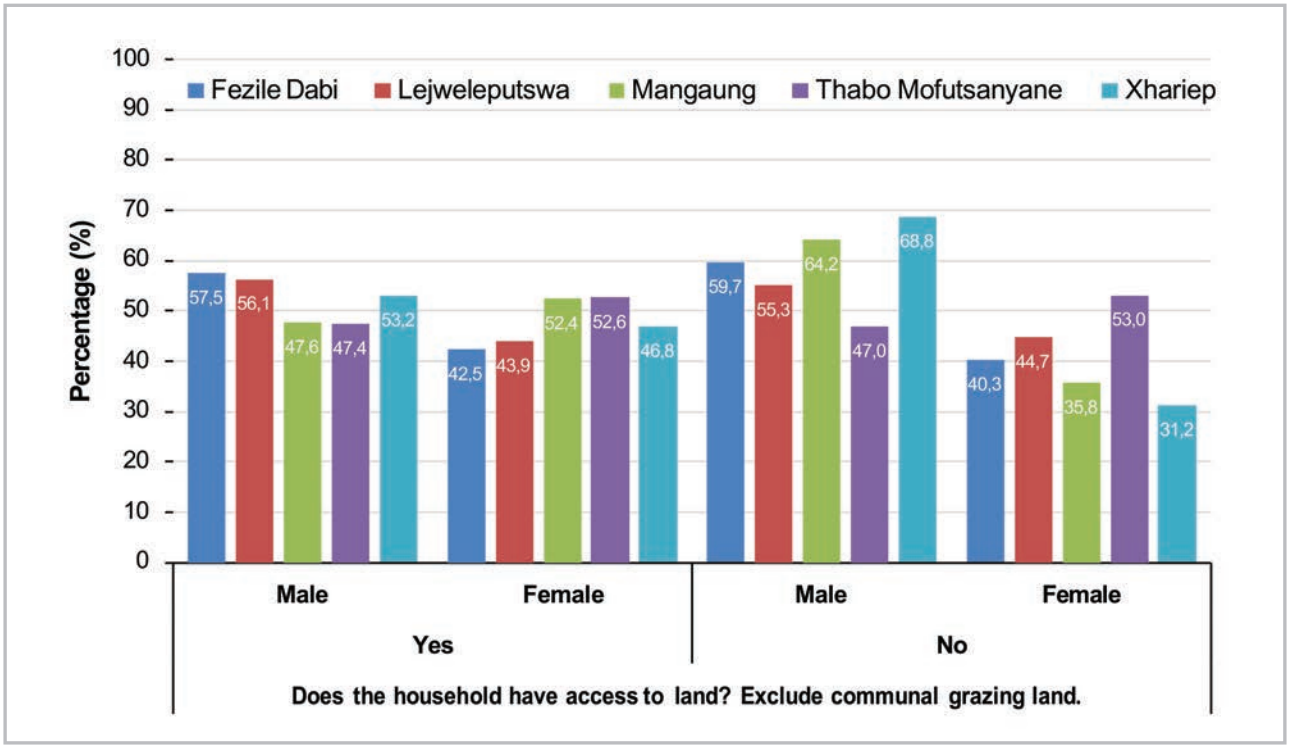


Figure 19: *Land access disaggregated according to household head sex in the Free State Province*

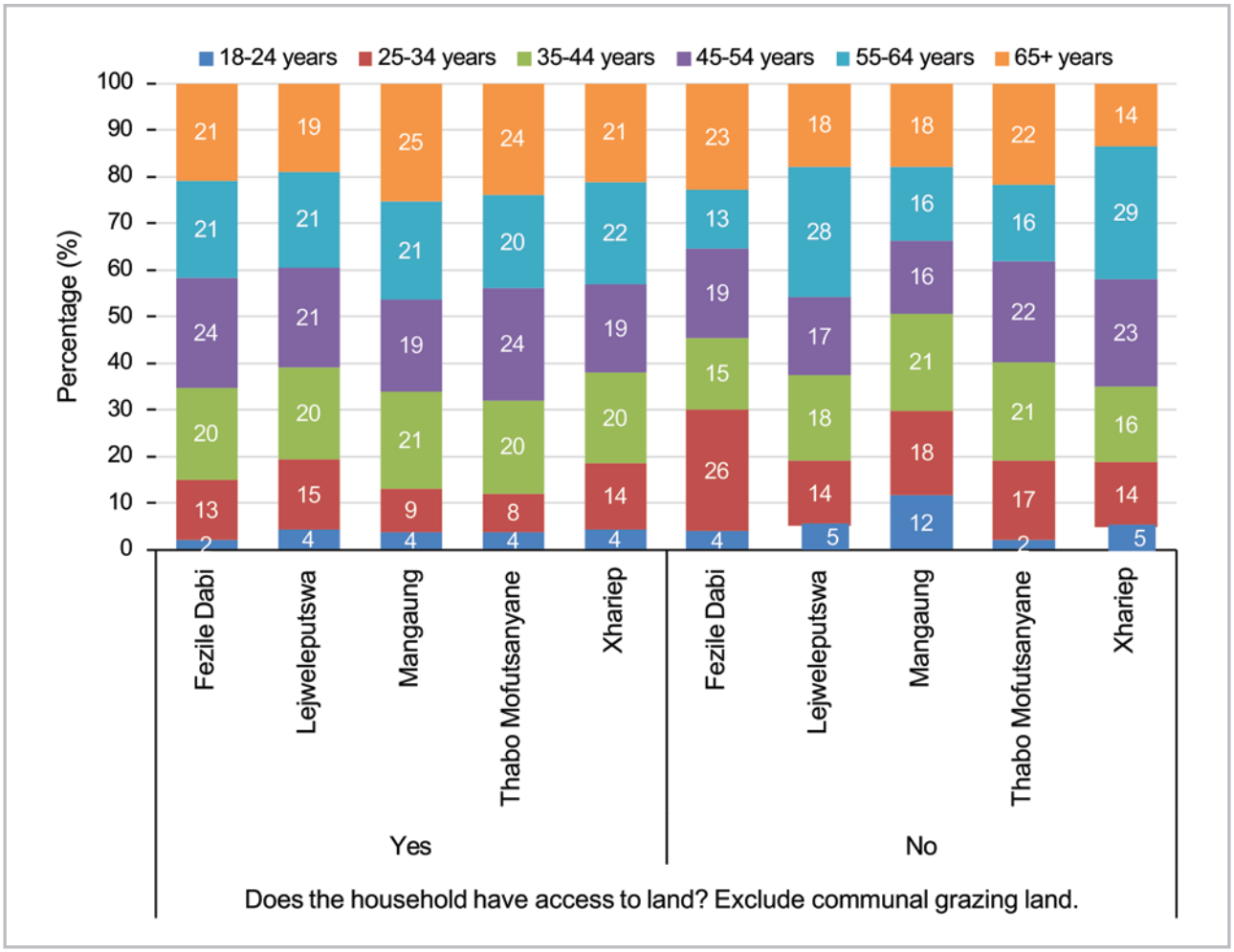


Figure 20: *Access to land disaggregated according to age*

Land access varied disproportionately according to the different age categories, as shown in Figure 19. Nearly, all the respondents in the 18-24 years age category have extremely limited access to land across the five districts. It should be noted that as is expected in a well-functioning society, we expected low levels of child/youth-headed households to have access to land, hence the extremely low levels of the youth with access to land. As expected, access to land increased with an increase in age, hence the age group between 25-44 years have the highest percentage of access to land.

6.1.2 Land tenure system

Results from the household survey show that of the land that they have access to, most of it is owned by the households (Figure 21), with households in both Magaung and Thabo Mofutsanyane districts at the forefront, with 98% and 96%, respectively. However there is a small percentage of households who reside on land which is rented. Fezile Dabi reported that 14% of the land they are residing on is rented. In all the districts, almost all the households have access to land, which is less than 500m^2. This result indicates that the majority of the reported land owned is merely for residential purposes and not for agriculture production purposes (Figure 21). Ownership of the land in this context is a small area for dwelling, with extremely limited backyard farming or gardening.

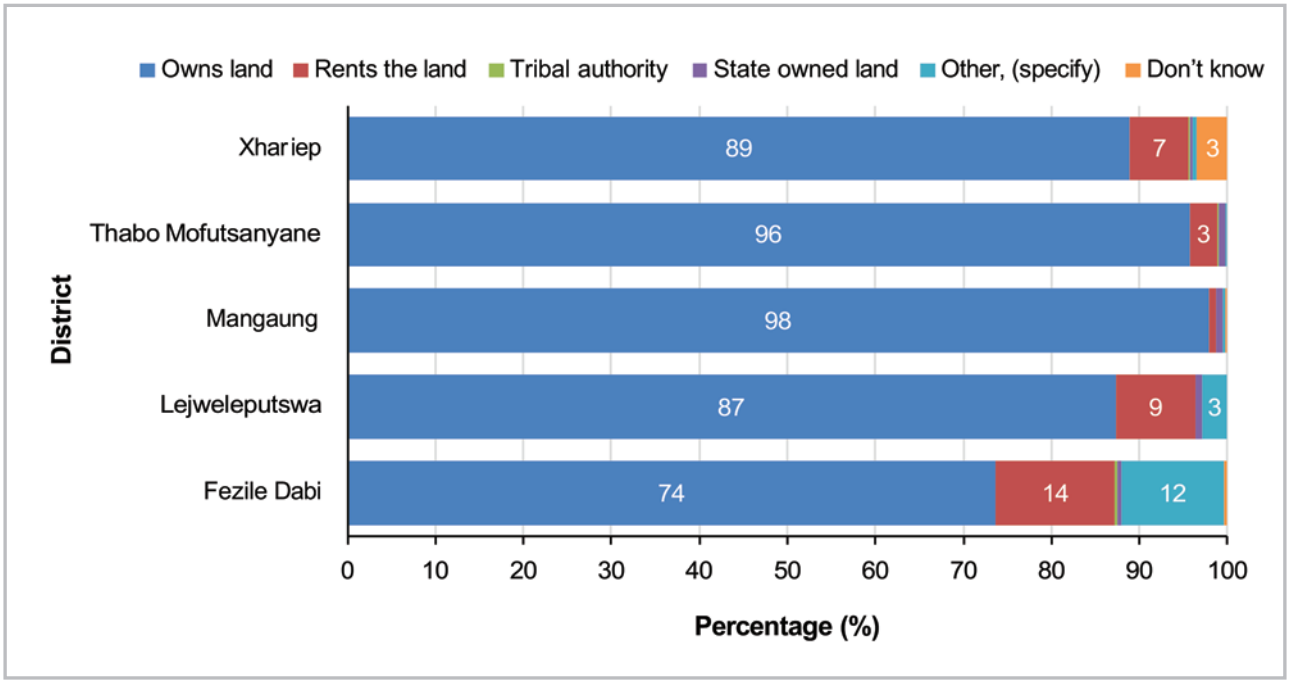


Figure 21: *Land tenure in the Free State Province*

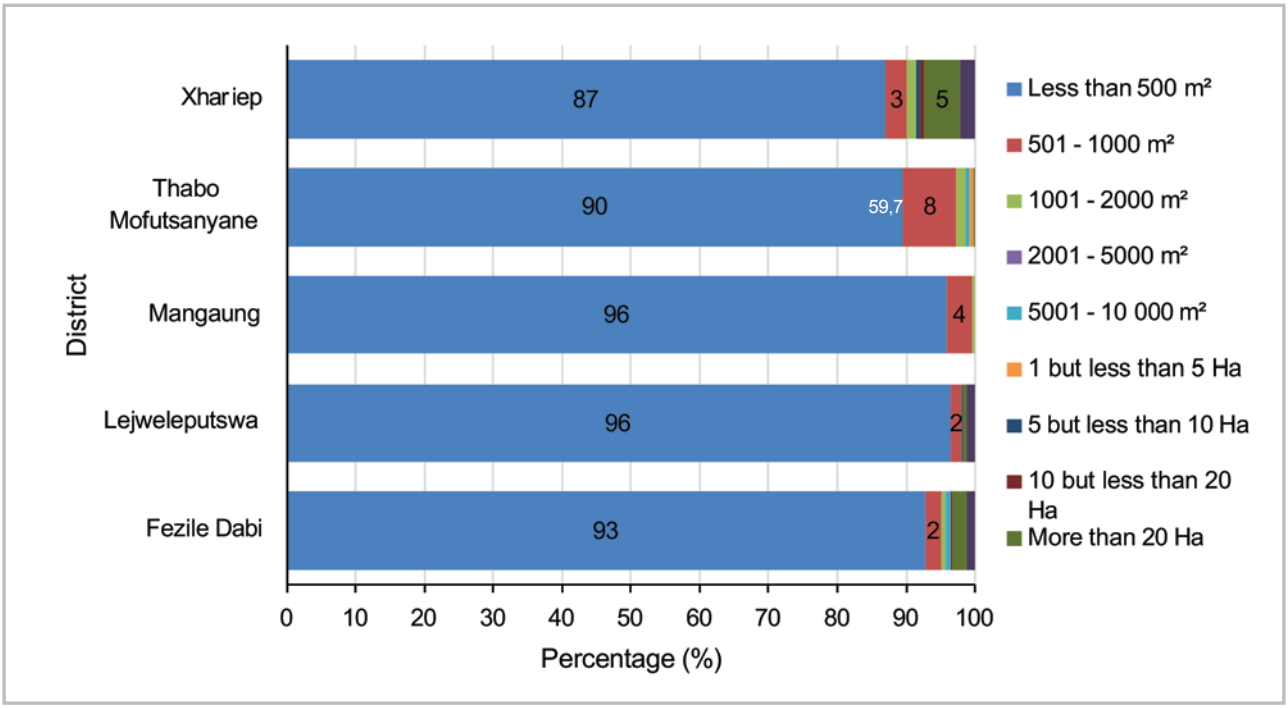


Figure 22: *The approximated agricultural land size accessed by households in the Free State Province*

6.1.3 Use of land for food production or other agricultural products

Within the province, the number of households who use the land for food and agricultural production is extremely low. Both Fezile Dabi and Lejweleputsa districts have 32% of their households with access to land which they use for agricultural purposes (Figure 23). To note a higher percentage (above 86% in all municipalities) of households have reported that their yards are less than 500m^2, hence the low level of households practising agriculture. Therefore, the land that was regarded as 'owned' was primarily meant for residential purposes with no adequate opportunities for backyard farming. The low level of involvement of the households in agricultural activities on their land might be influenced by the high concentration of commercial farms and mines in the province.

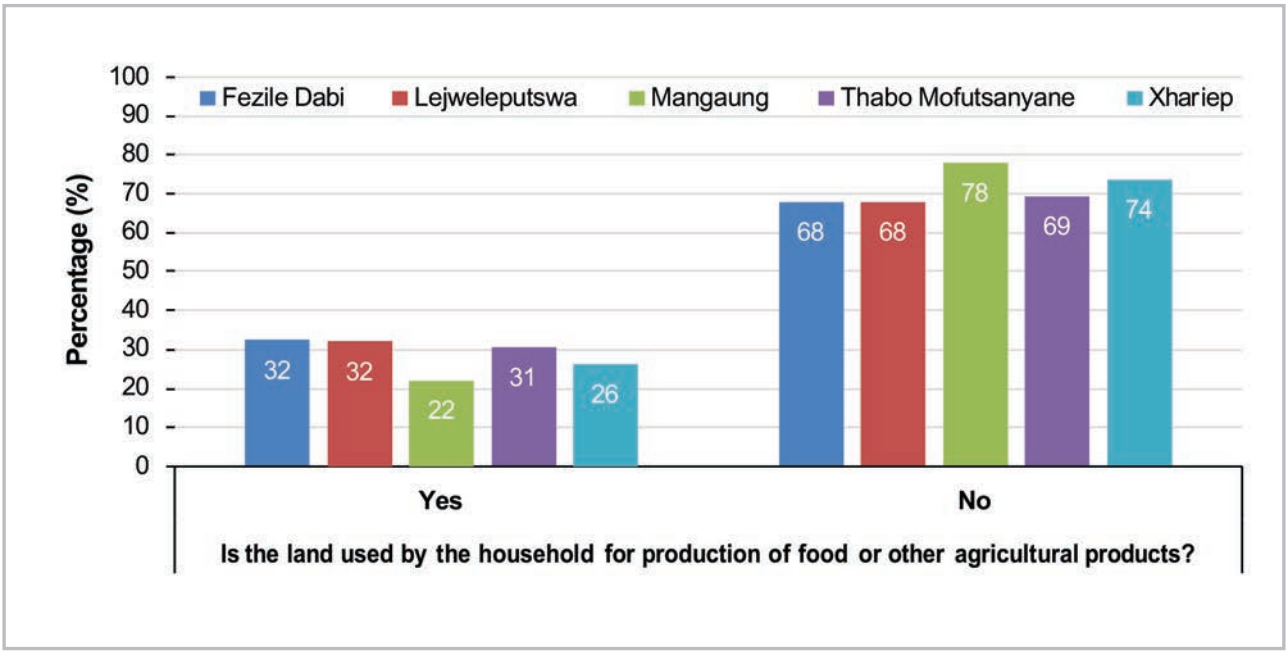


Figure 23: *Land use for food and other agricultural production in the Free State Province*

6.1.4 Crop and livestock production

Households in the Free State Province were practising livestock production at an extremely lower rate compared to food and crop production. Xhariep District is the only district with a slightly higher percentage of livestock production (Figure 24). This is largely because the district is well known for livestock farming. The low level of participation by households in livestock production in the Free State Province can be attributed to the high proportion of commercial farms and mining activities in the area, which forms part of the alternative livelihood activities.

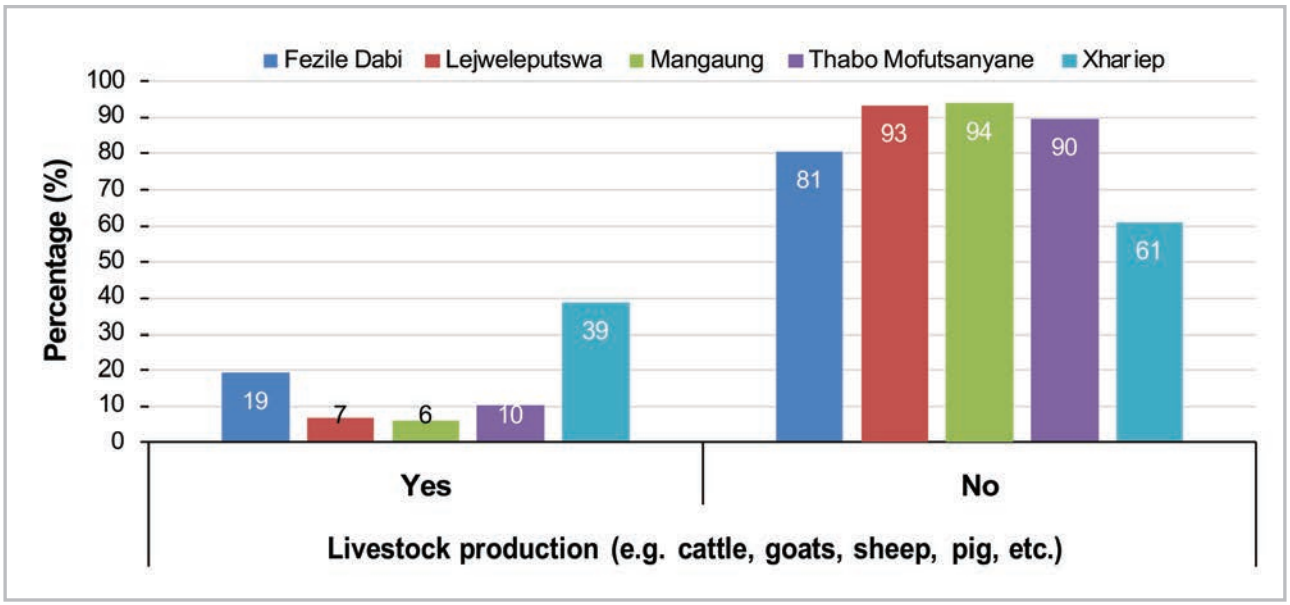


Figure 24: *Livestock production by district in the Free State Province*

Generally, poultry production is practised by a fairly average number of households in the Free State Province. The results indicated that 22% of the households in Fezile Dabi District were involved in poultry production. The least level of poultry production was reported in Lejweleputswa District, with 7% of the households engaged in poultry production (Figure 25). The low level of poultry production might be ascribed to the high concentration of mining activities and commercial farming activities that do not prioritise poultry farming.

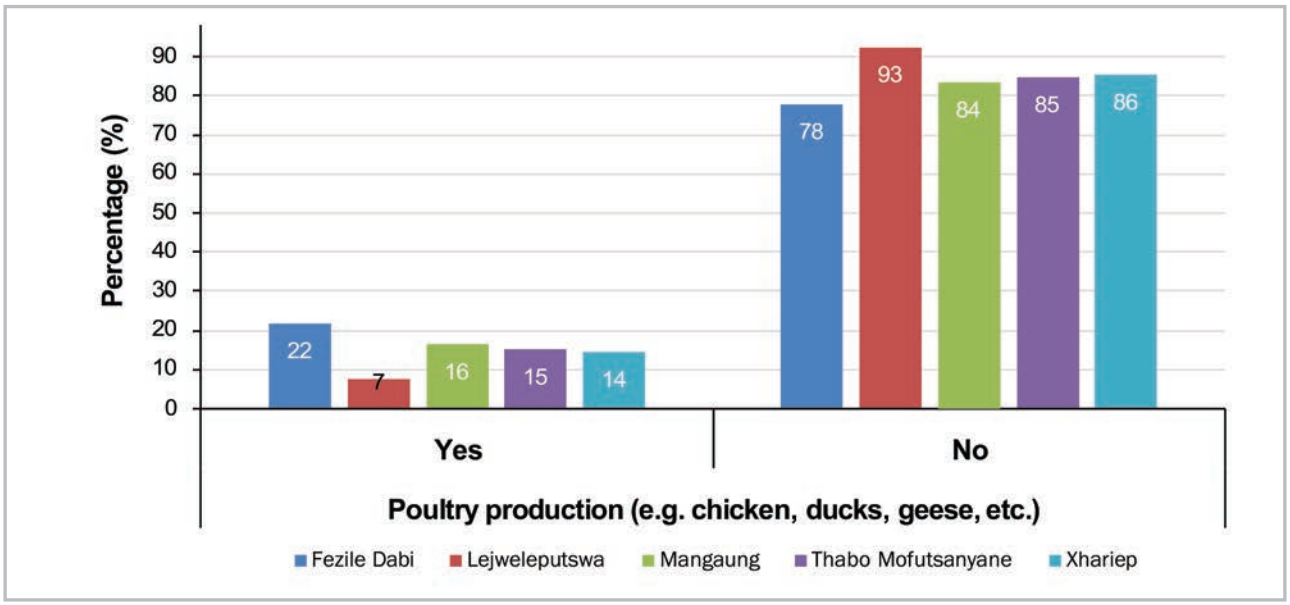


***Figure** 25: Poultry production by district in the Free State Province*

Households in the Free State Province reported an extremely low percentage of engagement in grain crop production, with Mangaung and Thabo Mofutsanyane districts reporting to have some fairly low level of engagement in crop production, pegged at 18% and 16%, respectively (Figure 26). Such low levels of grain production can be attributed to the fact that most of the households have smaller yards (less than 500m^2). Free State Province is well known for its high production of high value crops and maize since it is part of the Vaal Maize Triangle (which is characterised by climate which is conducive for maize and high value crop production). However, the households have not been extensively practising production of such crops. The other reason could be the abundance/ availability of such crops at cheaper prices since the commercial farms report high yields of such products.

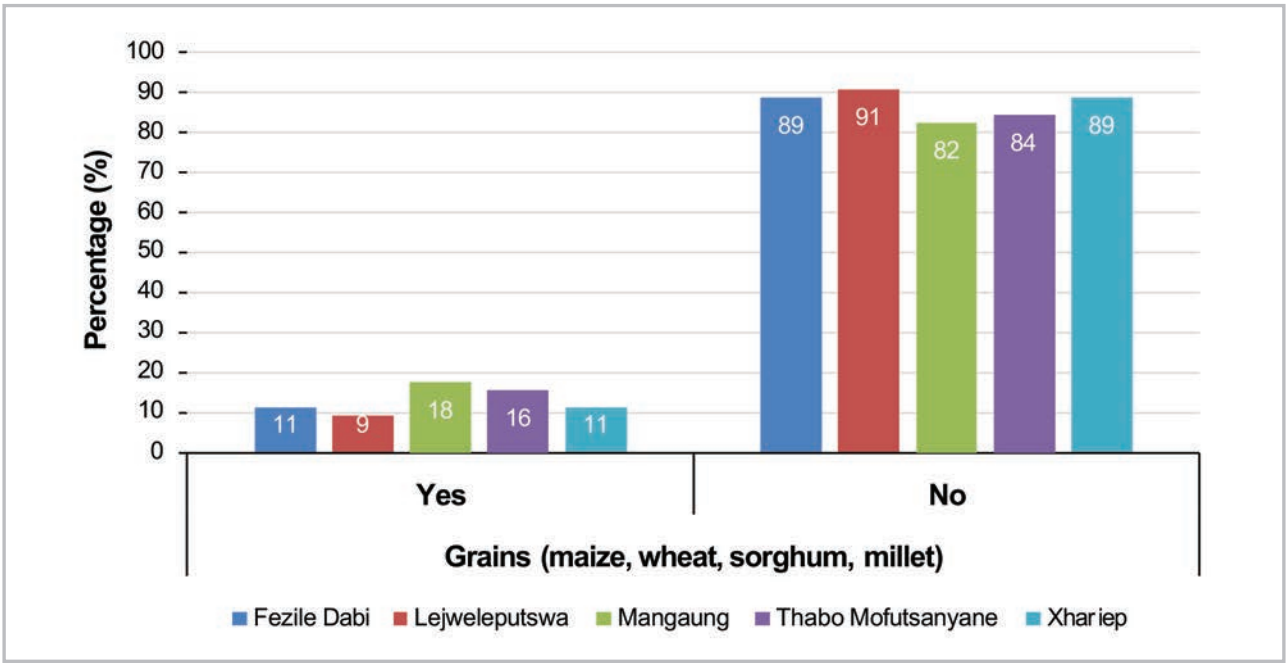


Figure 26: *Household involvement in crop production in the Free State Province*

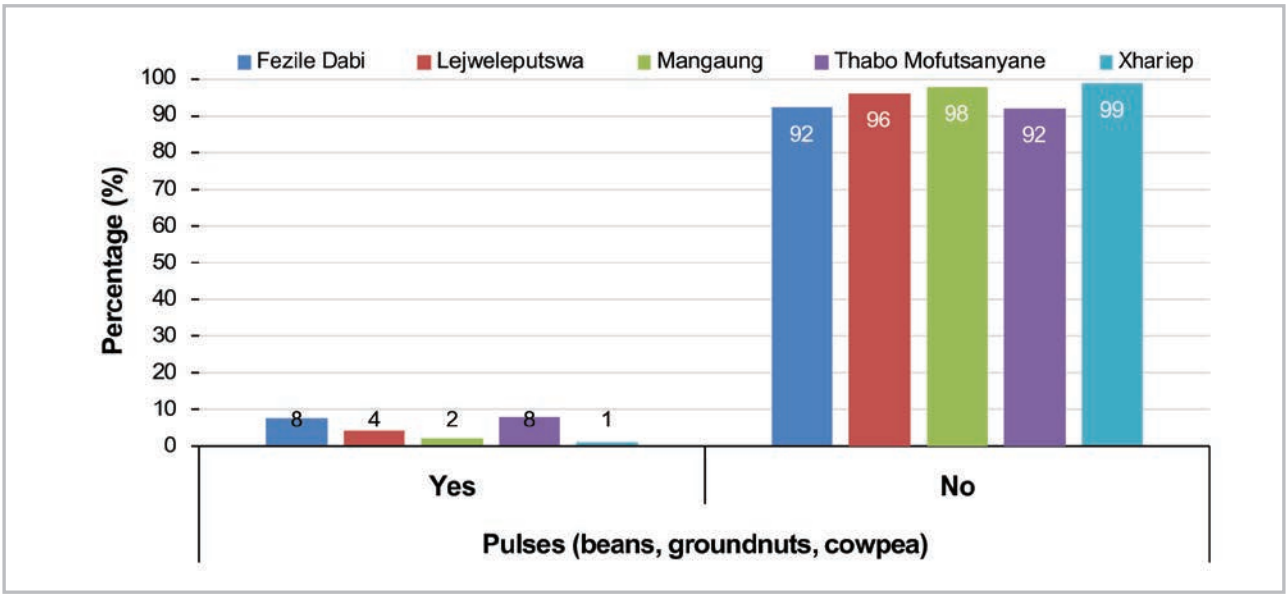


Figure 27: *Pulses Production by district in the Free State Province*

The production of pulses was reported to be the least practised by most households in Free State Province within all five districts (Figure 27). More than 90% of the households in the district do not produce pulses.

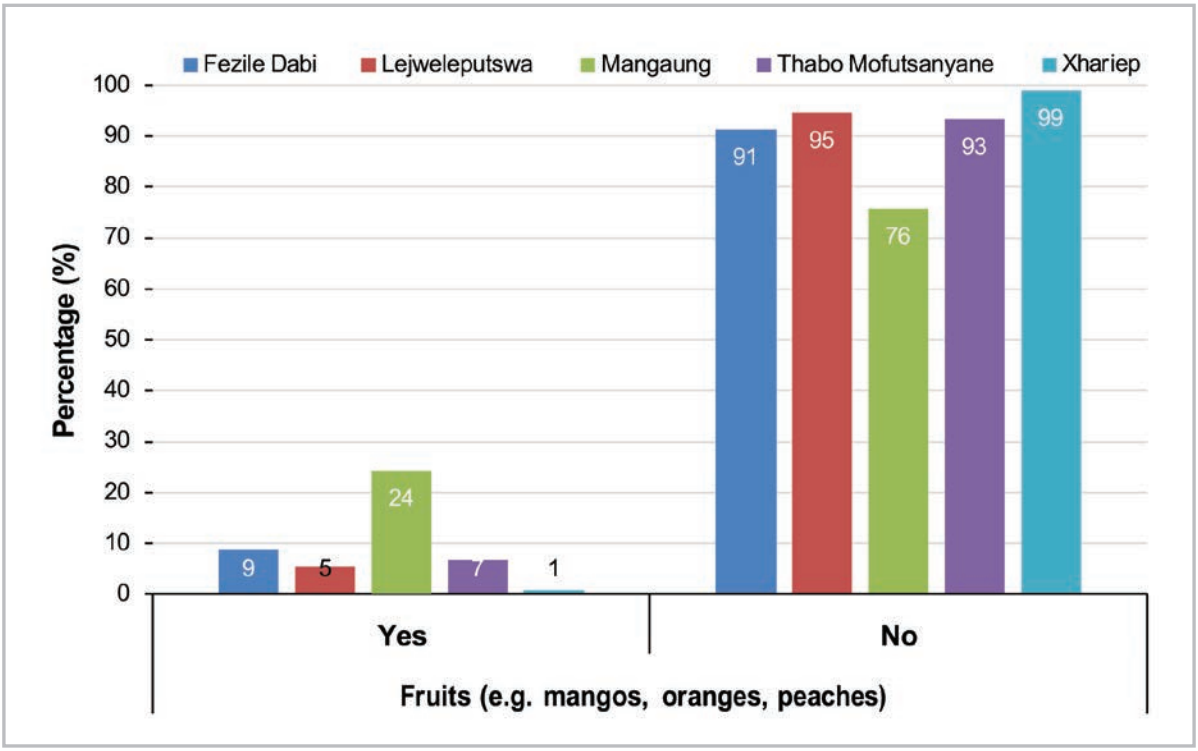


Figure 28: *Household fruit production in Free State Province*

Fruit production was reported to be extremely low in all the districts in the Free State Province. The highest engagement in fruit production has been at most 24% in Mangaung District. The province is popularly known for producing tropical and deciduous fruits.

6.1.5 Major crops grown

Crop production plays a major role in supplementing food availability among the rural households in the province. Both qualitative and quantitative data shows that maize, beans, potatoes, and vegetables are the major crops grown in the open-access livelihood zones of the province. Hence agricultural extension services for both livestock and crops are mostly demanded by the majority of the households.

6.2 Wealth Breakdown, Food, and Income Sources

Wealth breakdown is the process by which people within a livelihood zone are grouped together using local definitions of wealth and the quantification of their assets. The wealth breakdowns are used to identify the poorest households or those that are most vulnerable to projected shocks. Criteria was generated by communities thus provide locally relevant sources of information on vulnerability. The level of division depended on how the community viewed their society, and the purpose of the analysis. The wealth group, in this case, is a group of households within the same community who share similar capacities to exploit the different food and income options within a particular livelihood zone. It disaggregated the population into common 'access' groups, which allowed researchers to see important differences in households' vulnerabilities to different shocks and to estimate the number of people who may be affected by different economic changes.

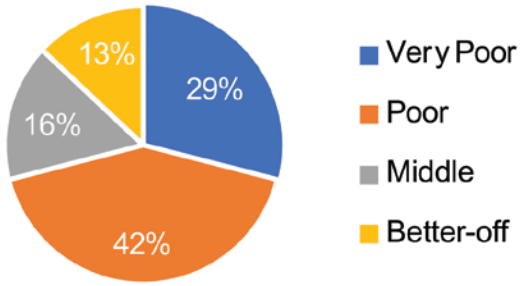
The analysis showed that geography plays a critical role in determining a household's options for obtaining food and income in a society. However, it is not the only factor that determines the pattern of livelihood. While geography tends to define a household's options for obtaining food and income, the ability to exploit those options and to survive in a crisis is determined largely by wealth. In other words, what people have by way of land, capital, and livestock, together with their educational status and access to political and social networks, determines the ways in which they are able to get food and cash, as well as the ways in which they will respond to sudden or long-term change.

This section provides an analysis of wealth, food, and income sources in the three livelihood zones in the province. The analysis focused on factors that determine how well-off community members might be based on prevailing livelihood assets. The wealth breakdown is the analysis which entails grouping households based on wealth and assets. The investigation of differences between households is central to building a meaningful analysis of food security and vulnerability to different hazards. Results emerging from the HEA focus group discussions indicate that most of the households in Free State Province are 'poor' and 'very poor'. This result is a cause for concern with regards to government interventions that need to be tailor-made for this province.

6.2.1 Free State Open Access Cattle and Crops Livelihood Zone (ZAOCC) of Thaba Nchu District

Wealth in this area is determined by four factors:

1. Employment, a product of education, and good social connections;
2. Ownership of a business, such as a spaza shop or bakkie or taxi;
3. Land holding; and
4. Household livestock ownership.



Category	Item	Wealth Group (typical value in brackets)			
		'Very poor'	'Poor'	'Middle'	'Better off'
Hh Size		8-10 (9)	6-8 (7)	4-6 (5)	3-5 (4)
Land (Ha)	Owned	3	3	3	3
	Cultivated	0.5	0.5	0.5	0.5
Livestock (head)	Cattle	4 (2-6)	6-8 (7)	10-30 (20)	28-46 (37)
	Goats	1-3 (2)	1-3 (2)	4-6 (5)	10-16 (13)
Income	Main	Grants	Grants	Formal employ	Formal employ

Figure 29: *Wealth breakdown in ZAOCC Livelihood Zone*

Land holdings increase with wealth but not as exponentially as the factors listed above (3ha across the wealth groups). The wealthiest households, described as the 'better-off', are those with permanent work, a salary, and have business opportunities. They have an average annual income of R350,001 compared to the R52,472 of the 'very poor' households. Households that have lower-paying or less permanent formal employment and some business opportunities with an average annual income of R142,243 are referred to as the 'middle'. Those who depend primarily on grants are described as the 'poor' and 'very poor'; collectively, they are about 70% of households. These 'very poor' and 'poor' supplement their grant income with casual labour, self-employment and, in very small quantities, crops and livestock.

'Better-off' households are able to develop slightly more land and produce crops for sale, using savings from their other income sources to afford inputs (including labour). Similarly, they derive a small cash benefit from

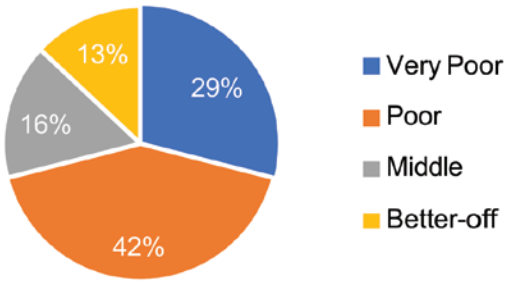
their animals. 'Middle' households also sell crops and livestock or livestock products. During the COVID-19 lockdown restrictions, the 'poor' and 'very poor' households are the ones who suffered the most impacts of food insecurity.

Livestock holdings also increase substantially with wealth. Cattle are considered more as determinants of wealth; wealthier households do keep them, while they may not keep any small stock -although on average, they do keep more goats than poorer households.

6.2.2 Cold highlands Open Access Livestock (ZACHO) of Thabo Mofutsanyane District

Wealth in this livelihood zone is determined primarily by three factors:

1. Employment, a product education and good social connections;
2. Ownership of a business, such as a spaza shop or bakkie or taxi; and
3. Livestock ownership, especially cattle.



Category	Item	Wealth Group (typical value in brackets)			
		'Very poor'	'Poor'	'Middle'	'Better off'
Hh Size		7-9 (8)	5-7 (6)	4-6 (5)	3-5 (4)
Land (Ha)	Owned	0.1	0.1	0.7	1
	Cultivated	0.1	0.1	0.4	1
Livestock (head)	Cattle	1-3 (2)	3-5 (4)	10-18 (14)	30-40 (35)
	Goats	2-4 (3)	4-10 (7)	20-30 (25)	30-40 (35)
Income	Main	Grants	Grants	Formal employ	Formal employ
	Annual (R)	32 410	41 029	169 363	303 861

Figure 30: *Wealth breakdown in ZACHO of Thaba District*

Land holdings increase with wealth but not as exponentially as the factors listed above (0.1ha for the poorest against 1ha for the wealthiest). Since farming in this zone is important and requires resources and capital, the amounts of land owned and cultivated vary with wealth. 'Better-off' households lever their fixed incomes and assets to develop more land and cultivate farms that are eight times larger than those of 'very poor' households.

The wealthiest households, described as the 'better-off', are those with permanent work, a salary, and have business opportunities. They have an average annual income of R303,410 compared to less than R5,000 per month of the 'very poor' households who struggle to meet their daily food and non-food needs (Figure 30). The results indicate income disparities among the 'poor' and 'better-off' households in the livelihood zone.

Households that have lower- paying or less permanent formal employment and some business opportunities with an average annual income of R169,363 are referred to as the 'middle'. Those who depend primarily on grants are described as the 'poor' and 'very poor'; collectively, they are about 71% of households. These 'very poor' and 'poor' supplement their grant income with casual labour, self-employment and, in very small quantities, crops and livestock.

'Better-off' households are able to develop slightly more land and produce crops for sale, using savings from their other income sources to afford inputs (including labour). Similarly, they derive a small cash benefit from their animals. 'Middle' households also sell crops and livestock or livestock products. During the COVID-19 lockdown restrictions, the 'poor' and 'very poor' households are the ones who suffer the most impacts of food insecurity.

During interviews, key informants in the villages tended to use larger household sizes compared with those from other surveys such as the census. This was possibly due to key informants referring to family units rather than the stricter definition of household. These family units will certainly share some resources, including grants such as pensions and child grants, cultivated land (shared in terms of labour required and production), or the proceeds from casual labour. They are, therefore, used in the ensuing calculations on sources of food and income - these can be scaled to the appropriate household size from the census..

6.2.3 Source of food in ZAOCC Zone of Thaba Nchu District

Sources of food are expressed in terms of contribution to the minimum human food energy needs, which is 8,800 kJ/person/day. Wealthier households may consume considerably more than this, for example 12,144 kJ/person/day, which is 138% of minimum food needs. Some of this consumption may be wasted, for example when food is thrown away or incompletely eaten. Even the poorest households may consume slightly more than the minimum requirement, for example 111%, or 9,768 kJ/person/day. Crop production contributed to 2% and 3% of the food sources for the 'very poor' and 'poor' wealth groups. Food purchases contributed about 91% and 90% of the food needs for the 'very poor' and 'poor' households. Despite the good rainfall and fertile soils, purchases still made up a significant portion of people's sources of food. The contribution to food energy from non-staple food purchases increased steadily from 41% to 56% across the wealth groups (Figure 31). The 'very poor' and 'poor' households also accessed food from payment in kind from the 'betteroff' wealth groups. The 'very poor' and 'poor' households could hardly cover their basic food and livelihoods needs in normal times, leaving little financial ability to invest in their children's needs, such as education. About 90% and 91% of the 'very poor' and 'poor' households' food needs were drastically affected by COVID-19 restrictions, leaving them vulnerable to food insecurity.

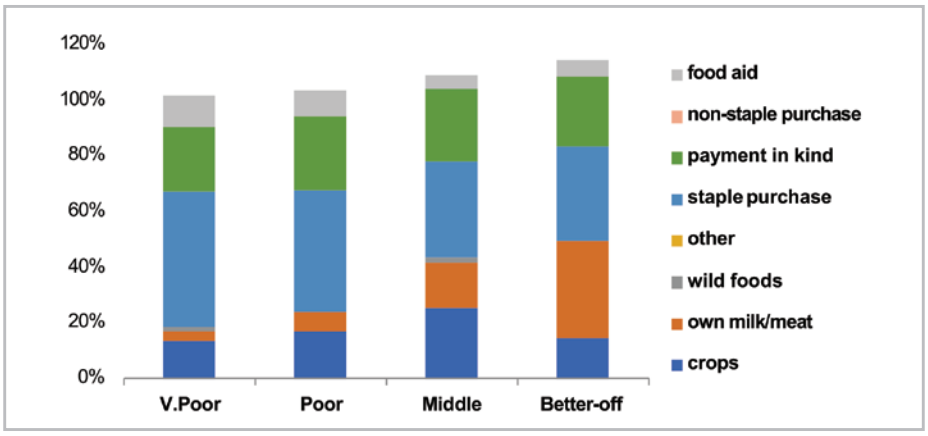


Figure 31: *Sources of food in ZAOCC (Expressed as percentage of minimum average food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

Wealthier households have the capital for inputs and hired labour, ensuring their crops are planted and weeded in time, as well as being protected from pests.

'Middle' and 'better-off' households obtained a tiny proportion of their needs from their livestock; this was usually from cow milk and occasional slaughter for meat. Dairy production in this zone is not commensurate with herd sizes and livestock ownership. In general, a fraction of lactating cows (about 1 in 8) is milked for consumption.

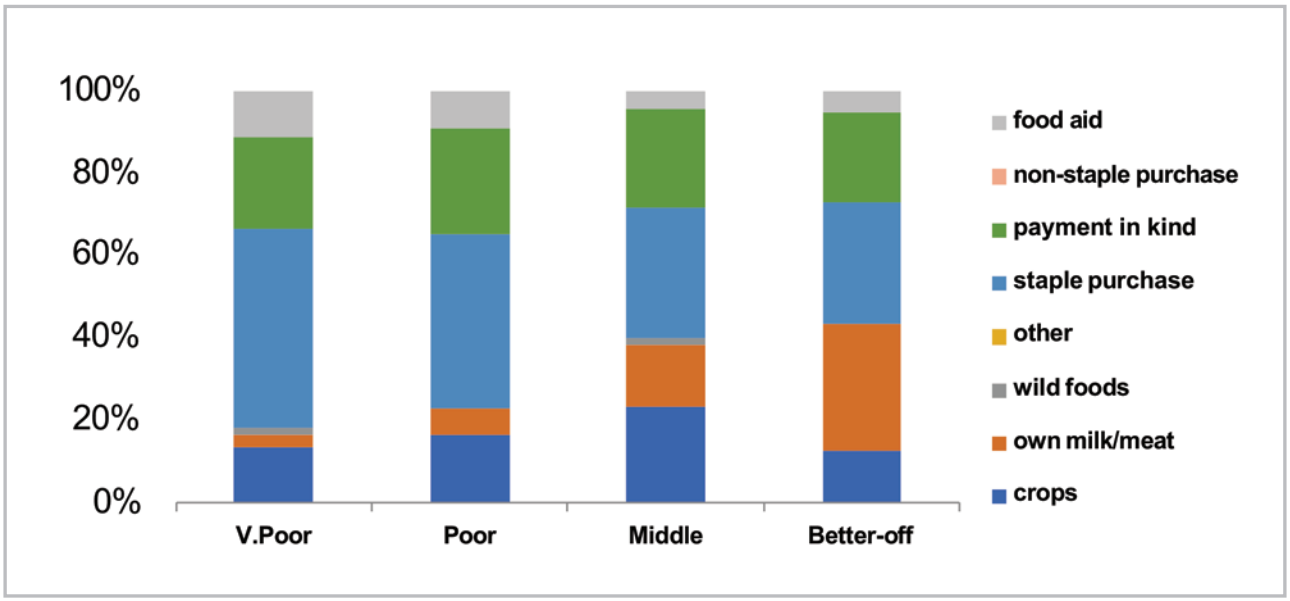


Figure 32: *Sources of food in ZAOCC (expressed as percentage of overall total food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

The poorest households' children received additional food from school lunches, which is the official food assistance. Wealthier households tend to send their children to fee-paying schools that do not offer meals.

6.2.4 Gender analysis of who produces/generates Food in ZAOCC of Thaba Nchu District

Policy makers recognize that youths and women represent a vast human resource potential in development, with its own specific problems, concerns, needs, and aspirations. They need to be promoted to ensure their participation is equitable and equal in all development programmes. Gender and social status play an important role in determining access to food and cash, and responses to shocks and change. Poor female-headed households with little land may work for better-off households to get money to buy food; the 'better-off' may use profits from agriculture and employment as capital to engage in trade and business enterprises. In the event of a crisis and the COVID-19 lockdowns, 'poor' and 'better-off' households were affected differently. The 'poor' households lost opportunities to hire out their labour and obtain income for their daily needs, whereas the 'better-off' households managed to use their savings to cushion their households from food insecurity. Therefore, different wealth groups warrant separate examination for relevant policy options to improve their household welfare.

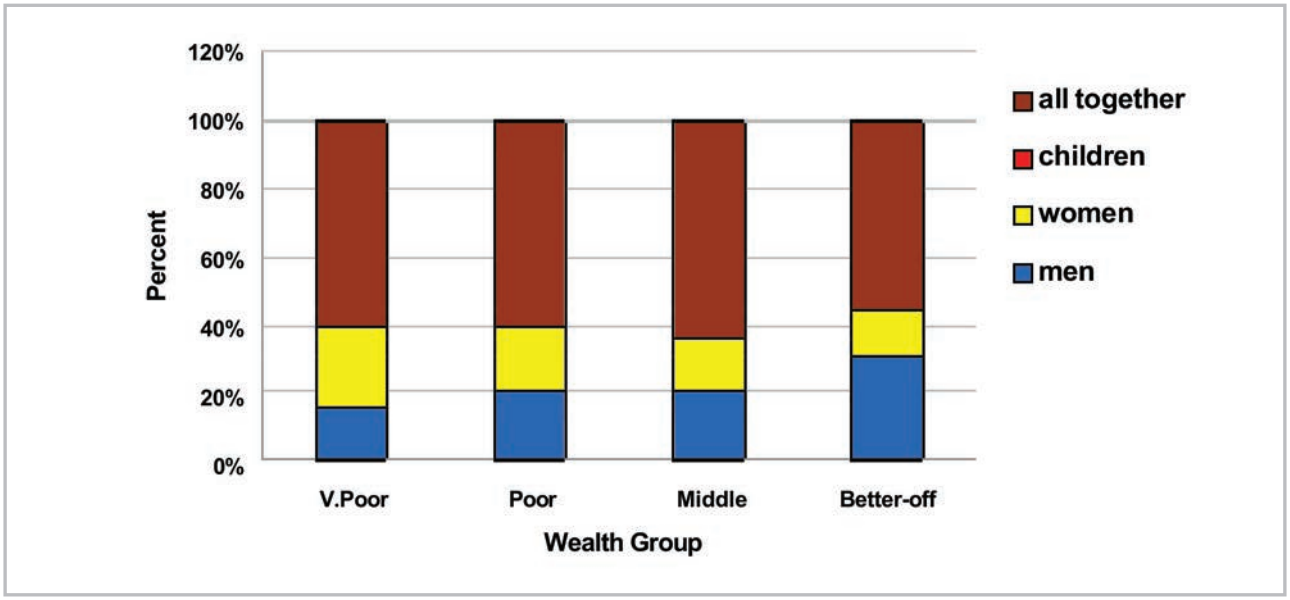


Figure 33: *Gender breakdown of who produces food in the zone for each wealth group in ZAOCC (Source: HEA, Qualitative Output)*

The results indicated that men and women altogether contributed significantly to generate food. This was about 60 percent across all wealth groups. Women appear to contribute significantly to the production of food among all wealth groups, ranging from 15% among 'better-off' and 25% among 'very poor' households. However, there are still challenges and emerging issues relating to gender mainstreaming and youth participation in development. These include HIV and AIDS, poor youth participation in the development agenda, gender-based violence (GBV), increased environmental degradation, climate change, and high levels of poverty. Women still face many challenges, including the burden of care, which takes away much of their time for productive work. They also have poor access to extension services, information, inputs, and markets. Hence addressing the gender gap in development, including agriculture could raise the scale of economic activities, crop production, boost agricultural yield, raise overall GDP and lift a significant proportion of people out of poverty. Further, there has been a general inadequacy among all the gender structures at all levels to maintain a collective and sustained response to gender and youth empowerment issues.

6.2.5 Sources of cash income in ZAOCC Zone of Thaba Nchu District

Cash incomes varied considerably across wealth groups, with the 'better-off' earning R350,001 per annum, seven times as much as the 'very poor', who earned only R52,472 per annum. Figure 33 below shows this distribution - it must be noted that the bars in the figure are not quartiles, they represent wealth groups and wealth groups are not distributed evenly (see Wealth Breakdown, above).

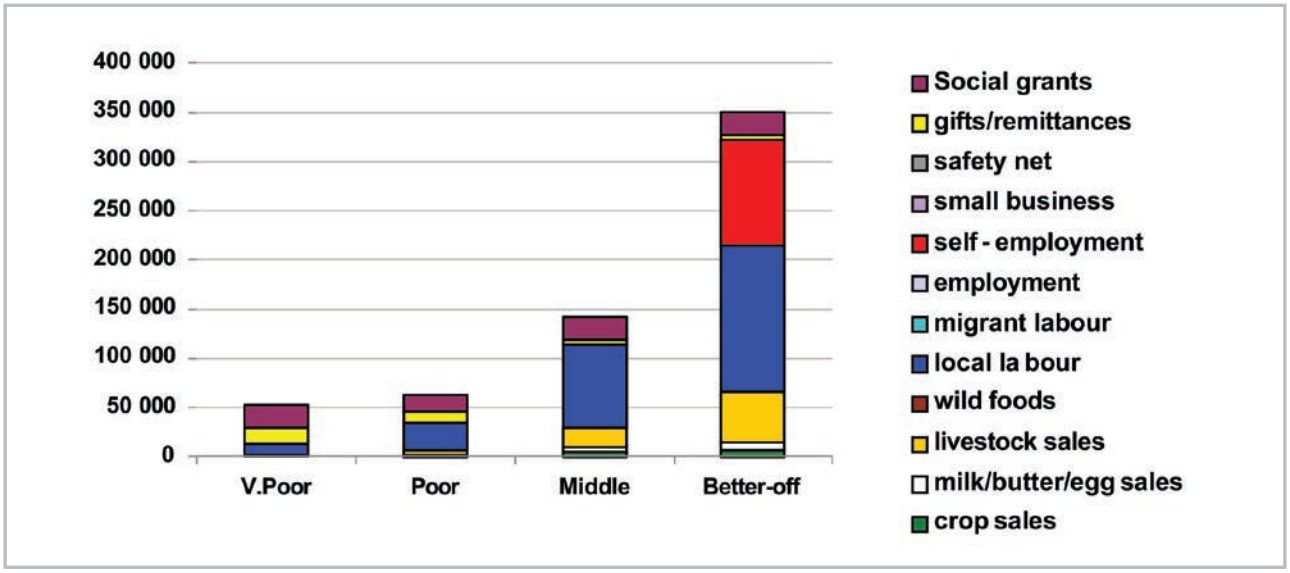


Figure 34: *Sources of annual cash income by wealth group in ZAOCC (Source: HEA, Qualitative Output)*

The main sources of cash incomes in the zone are: employment -for the 'middle' and 'better-off' -and cash grants for the 'poor' and 'very poor'. This is in keeping with most surveys that ask for the main livelihood source.

However, the point of this enquiry was to gain an understanding of how all livelihood sources come together to make up an income. This is essential because it enables practitioners to link a hazard (such as a price change) to outcomes and it enables other users to see potential areas of intervention. By dividing the value of each source by the total income, we can see these proportions, and this is presented in the graph in Figure 35 below.

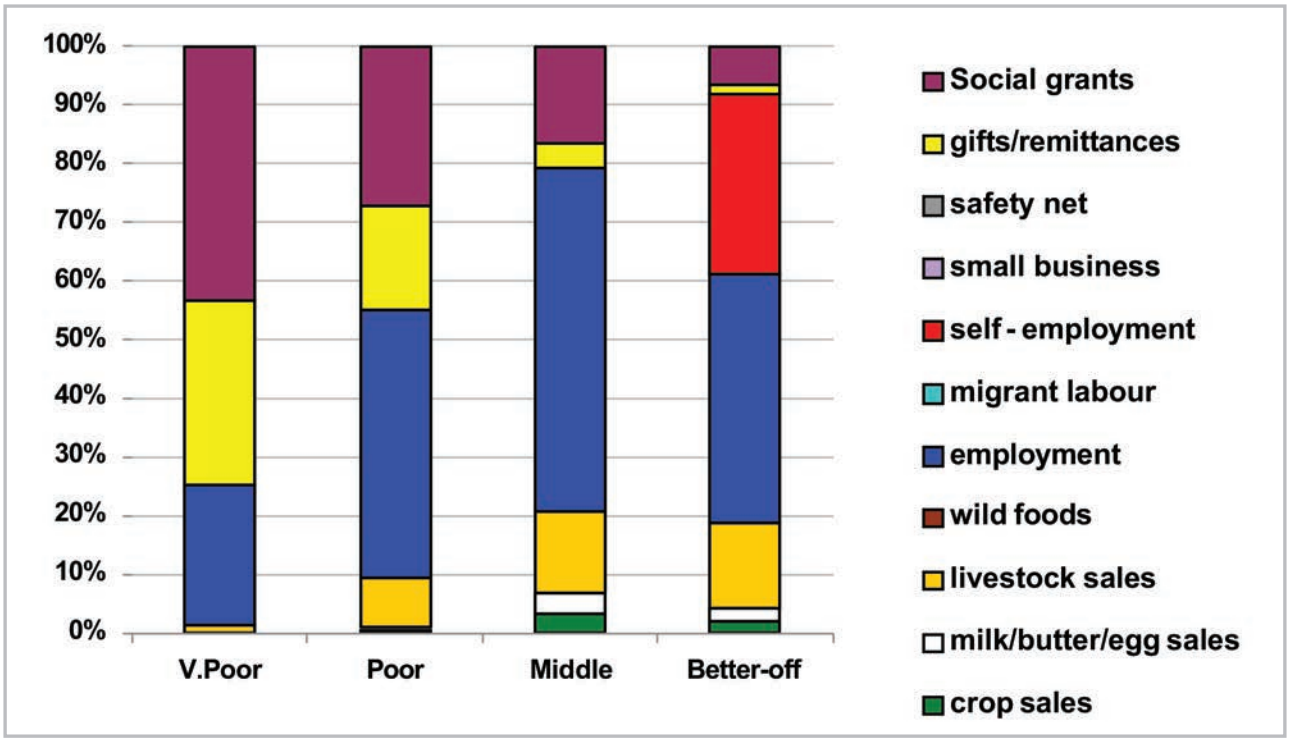


Figure 35: *Sources of annual cash income as a percentage of total, by wealth group in ZAOCC (Source: HEA, Qualitative Output)*

For the 'very poor' and 'poor', grants made up 42% and 26% of total cash income, respectively; the remainder was from casual labour and employment (mostly domestic work, agricultural piece work, construction jobs) and self- employment (collecting natural products for sale, weaving, making bricks, etc.). The 'poor' earn small amounts of income through livestock sales -usually goats and gifts/ remittances. This, coupled with a small income from the formal sector (R12,000 annually) was what distinguished their livelihoods from that of the 'very poor'. The analysis showed that poor households would lose up to 56 percent of their income sources due to COVID-19 lockdowns and any movement restrictions in the area. Income from casual labour would not be available during the pandemic lockdowns, leading to a worsening food security situation for the 'very poor' and 'poor' households who comprise most of the population in this area.

The 'middle' and 'better-off' gain their cash from a formal wage or salary for the better part of their income. Some 'middle' households may have a member that works seasonally on the commercial farms, but earnings typically amount to almost R126,000 per annum, while the 'better-off' earn around R168,000 per annum. 'Middle' and 'better- off' households also gain a little cash from grants (for example, pensions and fostering are not means-tested and the probability of a household having a pensioner in it is about one in two). The 'middle' and 'better-off' wealth groups also have employment opportunities and businesses which contribute to their improved livelihood and welfare. These well-off households were able to cushion their food availability and access even during lockdowns as they can buy in bulk and store during any unforeseen event or crisis.

The earnings from livestock products are very low for the 'very poor' and 'poor' households, which is lost productivity. The number of cows that are milked compared with those likely to be lactating is low, and this is due to a few factors: lack of economic incentives for milking, lack of time by the cattle-owners (because they are full-time employed), and minimal herd management.

6.2.6 Sources of food in ZACHO of Thabo Mofutsanyane District

Purchases were the largest source of people's food, contributing about 76% to 74% of minimum food energy needs (Figure 36). The contribution from staple food purchases decrease steadily as households get wealthier. The contribution from non-staple food purchases never increased with increasing wealth. Most households and all wealth groups also consume food from their own crop production, although the majority of the 'very poor', lack the labour and capital to produce any significant quantities of their own food.

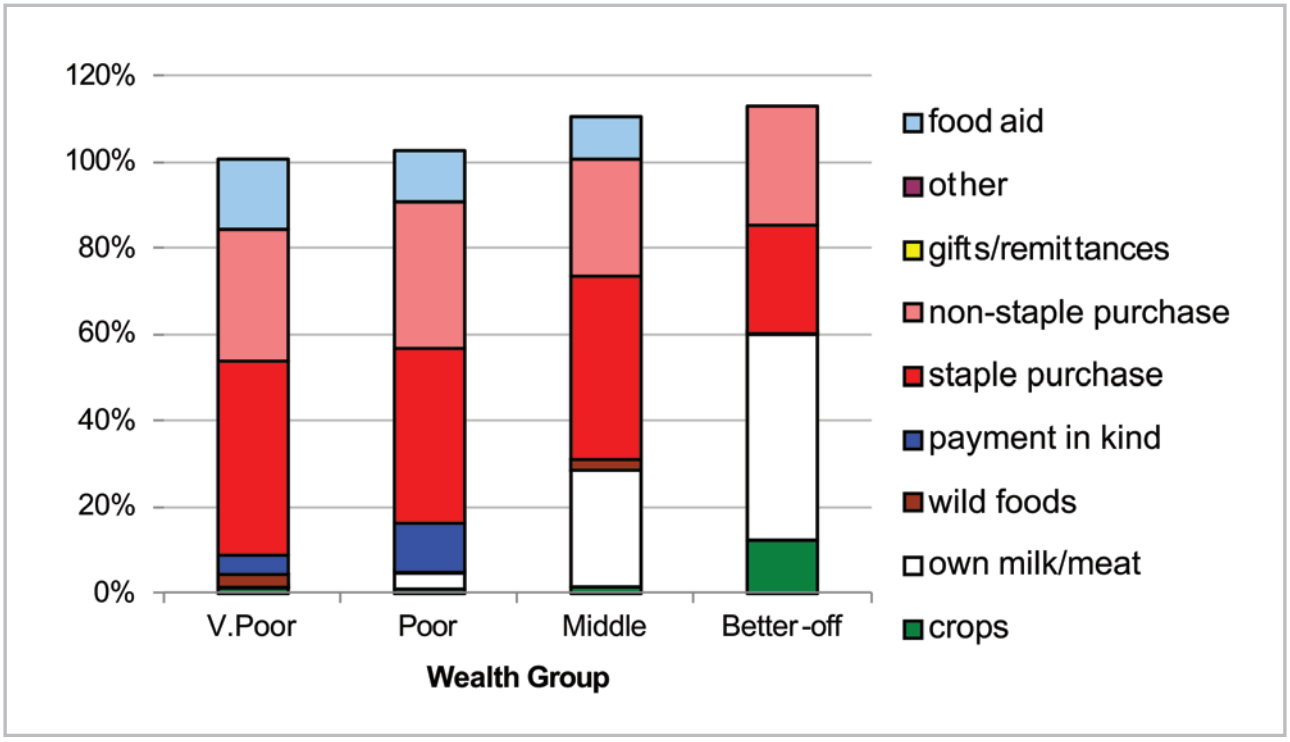


Figure 36: *Sources of food in ZACHO (expressed as percentage of minimum average food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

The 'better-off' and 'middle' class households have the highest contribution to their food energy from both staple and non-staple crops, at about 70% to 53% of their minimum needs, respectively. The analysis showed that about 76% and 74% of the food purchases which needed to be obtained on an almost daily basis from local markets were affected for the 'very poor' and 'poor' households, respectively, in this area during COVID-19 lockdowns. This has exacerbated the food insecurity level of the 'poor' and 'very poor' households in the area (Figure 37).

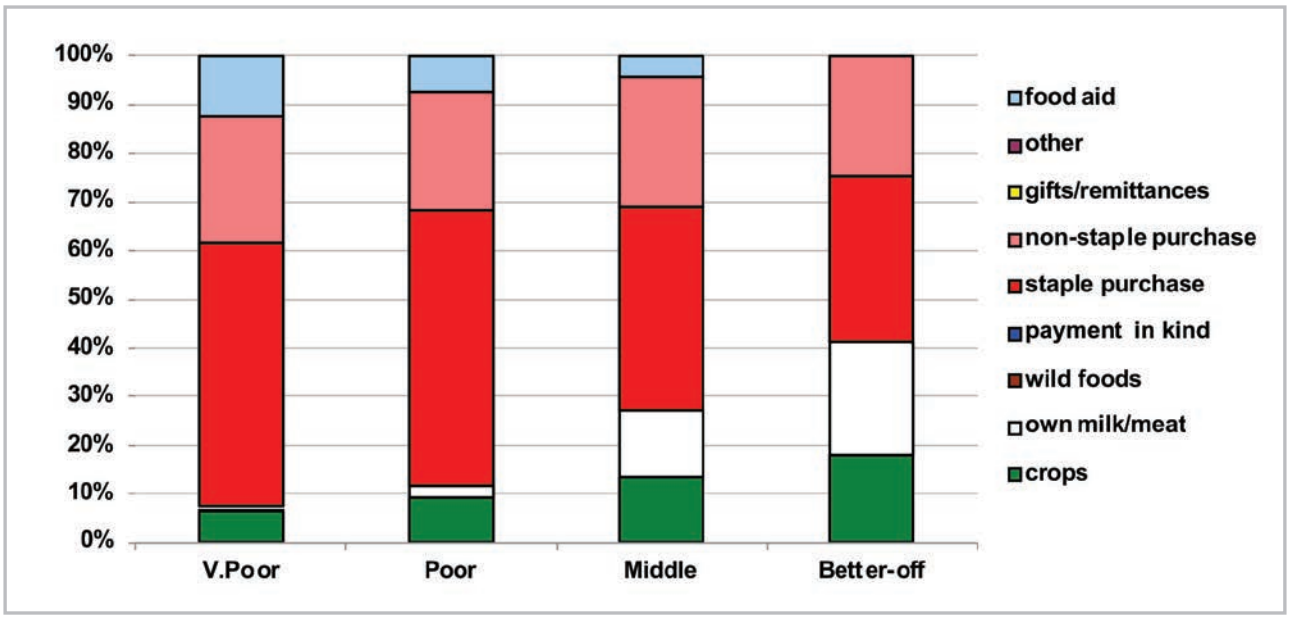


Figure 37: *Food Source as Contribution to the Total in ZACHO (Source: HEA, Qualitative Output)*

Only the 'middle' and 'better-off' households obtain substantial food from their livestock products; this is usually from cow milk and occasional slaughter for meat (the 'poor' obtain a small contribution from the meat of an occasional slaughter). Dairy production in this zone is not commensurate with herd sizes and livestock ownership. In general, a fraction of lactating cows (about 1:3 to 1:6) is milked for consumption.

The poorest households' children receive additional food from school lunches, which is the official food assistance. This food source for the poor households was also affected as school were closed during the COVID-19 lockdowns. Wealthier households tend to send their children to fee-paying schools that do not offer meals. All households may collect wild foods for consumption, but the quantities involved do not merit a significant contribution to food energy.

6.2.7 Gender breakdown of who produces food in ZACHO

Policy makers recognize the need for a participatory and inclusive approach to improving access to food and income in the communities. Hence, there is a need to promote and ensure the inclusion of the youths and women in food production. This is very critical to promote and ensure participation, equity, and equality in all development programmes.

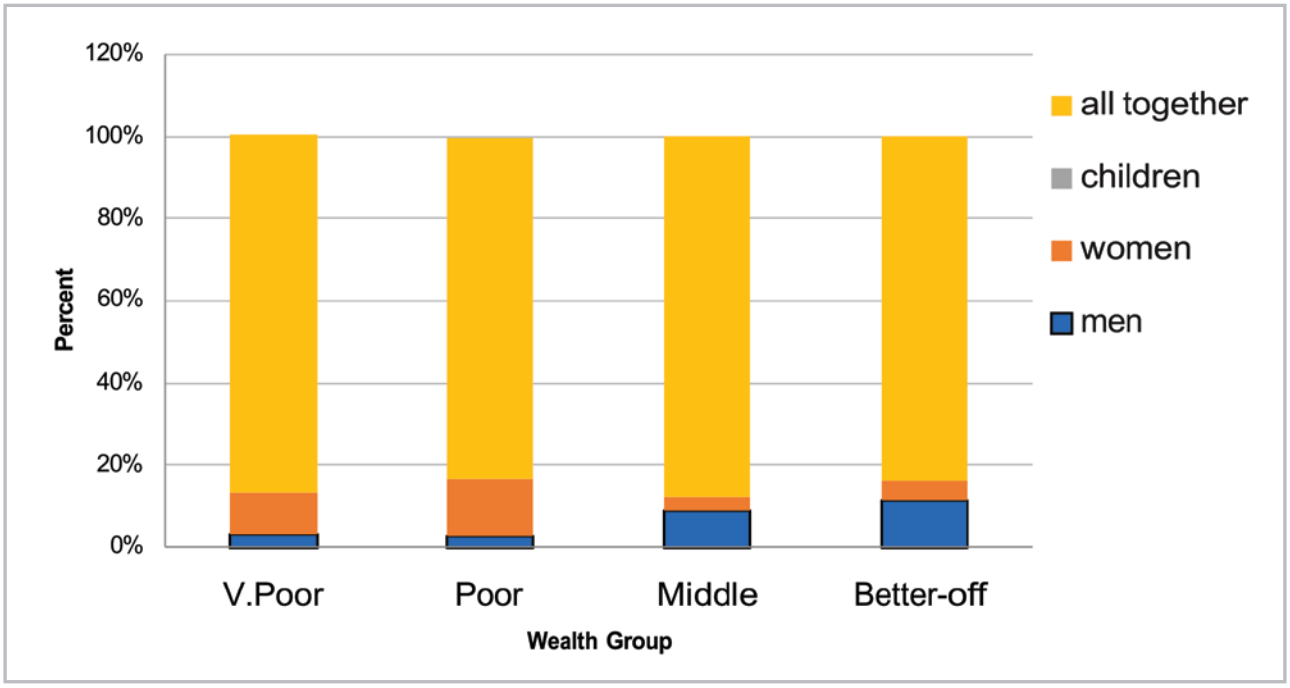


Figure 38: *Gender breakdown of who produces food in the zone for each wealth group in ZACHO (Source: HEA, Qualitative Output)*

The results indicated that young adults, men, and women altogether contribute significantly to generate food among the 'poor' and 'very poor' households in most districts and municipalities in this livelihood zone (Figure 38). Women appeared to contribute significantly to production of food among 'middle' and 'better-off' households. However, there are still challenges and emerging issues relating to gender mainstreaming and youth participation in development. These include HIV and AIDS, poor youth participation in the development agenda, gender-based violence (GBV), increased environmental degradation, climate change and high levels of poverty. Women still face many challenges, including the burden of care, which takes away much of their time for productive work. They also have poor access to extension services, information, inputs, and markets. Hence addressing the gender gap in development, including agriculture could raise scale of economic activities, crop production, boost agricultural yield, raise overall GDP and lift a significant proportion of people out of poverty.

6.2.8 Sources of Cash in ZACHO Zone of Thabo Mofutsanyane District

Cash incomes vary considerably across wealth groups, with the 'better-off' earning R303,861 per annum, more than ten times as much as the 'very poor', who earn R32,410 per annum. Figure 38 shows this distribution as the bars represent wealth groups and wealth groups.

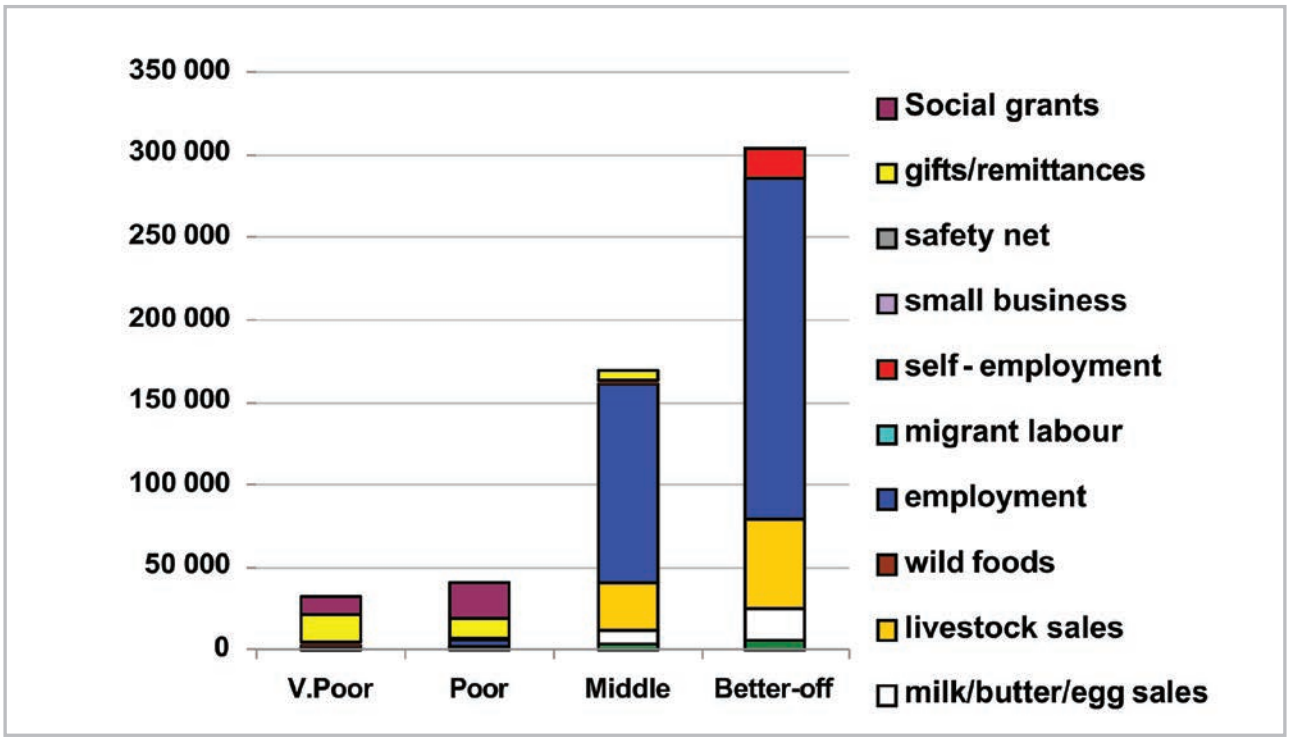


Figure 39: *Sources of annual cash income by wealth group in ZACHO (Source: HEA, Qualitative Output)*

The main sources of cash incomes in the zone are: formal employment - for the 'middle' and 'better off' - and cash grants for the 'poor' and 'very poor' (Figure 39). This is consistent with most surveys that assess livelihood strategies and their contribution to the main livelihood income source.

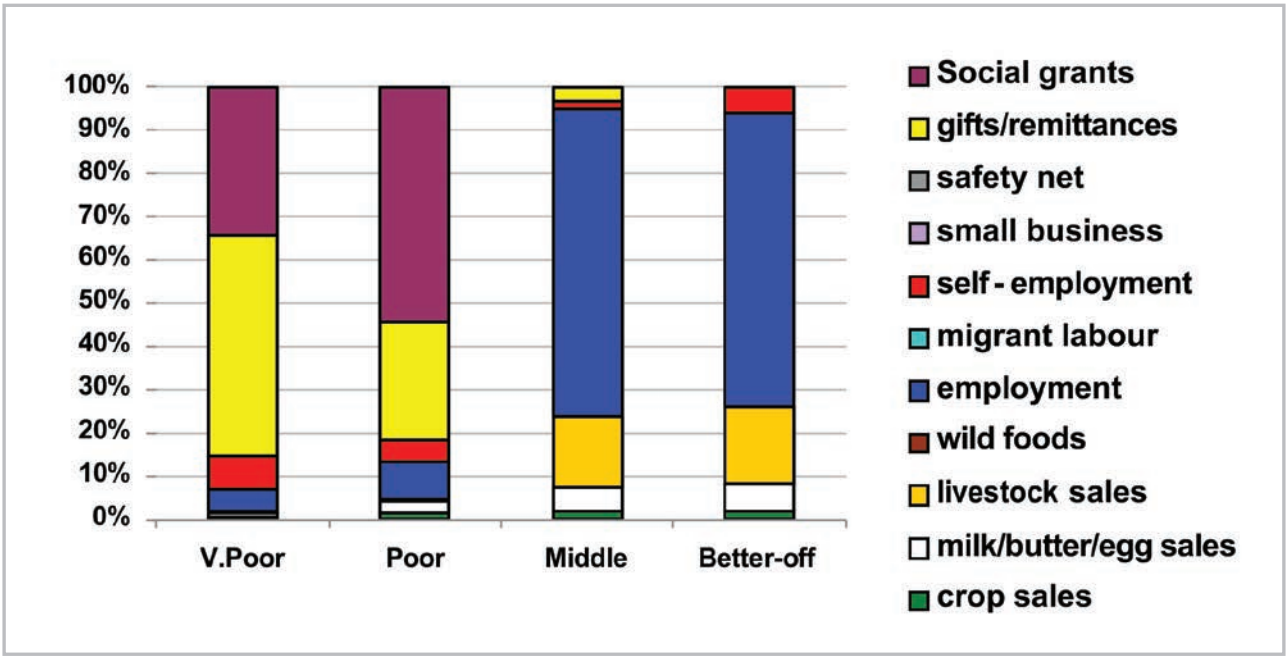


Figure 40: *Sources of annual cash income as a percentage of total, by wealth group in ZACHO (Source: HEA, Qualitative Output)*

However, the point of this enquiry was to gain an understanding of how all livelihood sources contribute to the main income of each wealth group in the sampled communities. This is important because it enables practitioners to link a hazard (such as a price change) to an income and it enables other users to see potential areas of intervention. By dividing the value of each source by the total income, we can see these proportions, and this is presented in the graph above.

For the 'very poor' and 'poor', grants make up 34% and 52% of total cash income, respectively; the remainder comes from casual labour (mostly domestic work, agricultural piece work, construction jobs, etc.) and self-employment (collecting natural products for sale, weaving, making bricks, etc.) (Figure 40). The 'poor', 'middle', and 'better-off' earn some of their cash from animal sales and from petty trading or a small business.

The 'middle' and 'better-off' gain their wealth from a formal wage or salary for the better part of their income. Some 'middle' households may have a member that works seasonally on the commercial farms, but earnings typically amount to almost R79,000 per annum, while the 'better-off' earn more. 'Middle' and 'better-off' households also gain a little cash from grants. The earnings from livestock products are nil, which is lost productivity. The number of cows that are milked compared with those likely to be lactating is low and this is due to several factors: lack of economic incentives for milking, lack of time by the cattle-owners (because they are full-time employed), and minimal herd management.

6.2.9 Hazards, vulnerabilities, and response strategies

Since households are dependent on markets for most of their food, they are most vulnerable to market shocks. These 'market shocks' may consist of escalating food prices, eroded grants (for example, when they are not adjusted to match consumer inflation) and job losses.

Droughts are frequent and have an impact on food production by reducing crops. However, unless food prices also rise simultaneously, households will manage crop losses by prioritising more cash for their food purchases. A severe drought can badly affect animal conditions and production, but the current low productivity means that it would only have an impact on 'better-off' households' asset bases.

Additional response strategies households may engage in under stress are switching expenditures, seeking more casual work (usually outside of the village) or selling off assets or belongings

6.3 Access to agriculture extension services, road infrastructure, and markets

Access to agricultural extension services, road infrastructure, and markets has The potential to improve household food security in the study area. This section highlights access to these services in the province.

6.3.1 Access to road infrastructure

Access to infrastructure such as roads is critical in enhancing food and nutrition security. Both females and males reported high levels of access to roads, with the 18-24 years age category having above 80% of access (Table 36). Across the five districts, road access was relatively good, with the highest (93%) being recorded in Xhariep District, whilst the least was reported in Fezile Dabi District (84%).

Table 36: Access to road infrastructure by households

Variable		Access to road infrastructure			
		No		Yes	
		N	Row N %	N	Row N %
Household		**98**	**13.6**	**665**	**86.4**
Sex of Household Head	Male	55	15	358	85
	Female	43	13	307	87
Household head age	18-24	2	13	13	87
	25-34	10	18	54	82
	35-44	16	13	99	87
	45-54	25	15	161	85
	55-64	22	14	147	86
	65+	22	11	180	89

Variable		Access to road infrastructure			
		No		Yes	
		N	Row N %	N	Row N %
Household		**98**	**13.6**	**665**	**86.4**
District	Fezile Dabi	24	16	135	84
	Lejweleputswa	27	15	143	85
	Mangaung	9	12	65	88
	Thabo Mofutsanyane	28	13	205	87
	Xhariep	10	7	117	93

6.3.2 Access to Markets

Within the Free State, both females and males had an equal share when it comes to access to the market, with both the sexes reporting above 88% access. Aggregated by district (Table 37), there is an ease of market access in the area, with Lejweleputswa having 96% access to the market. Access to the market is largely influenced by road networks, hence all the district households have reported having good access to the road infrastructure (Table 37).

Table 37: Access to market by households

Variable		Access to market			
		No		Yes	
		N	Row N %	N	Row N %
Household		**69**	**9.6**	**694**	**90.4**
Sex of Household Head	Male	45	11	371	89
	Female	24	8	323	92
Household head age	18-24	3	21	12	79
	25-34	3	3	61	97
	35-44	13	12	102	88
	45-54	15	9	170	91
	55-64	14	9	155	91
	65+	20	10	183	90
District	Fezile Dabi	16	9	144	91
	Lejweleputswa	6	4	164	96
	Mangaung	10	14	64	86
	Thabo Mofutsanyane	25	12	205	88
	Xhariep	12	9	117	91

6.3.3 Access to road Agricultural extension services

Access to agricultural extension services has been reported to be extremely low in the entire Free State Province (Figure 41). Crop production was reported to be extremely low in the previous sections and there is an extremely low percentage (1.7%) of households reporting to have received seedlings and fertilizers for free, and it does influence the low level of households' involvement in crop production. The situation is also exacerbated by the limited size of arable land as well as extensive commercial agriculture and mining activities within the province. Only about 1.3% of the households (Figure 41) have reported to have received support when it comes to dipping and vaccination services. Disaggregated by district, Xhariep District had the highest percentage (8%) of households with access to agricultural extension services (Table 38).

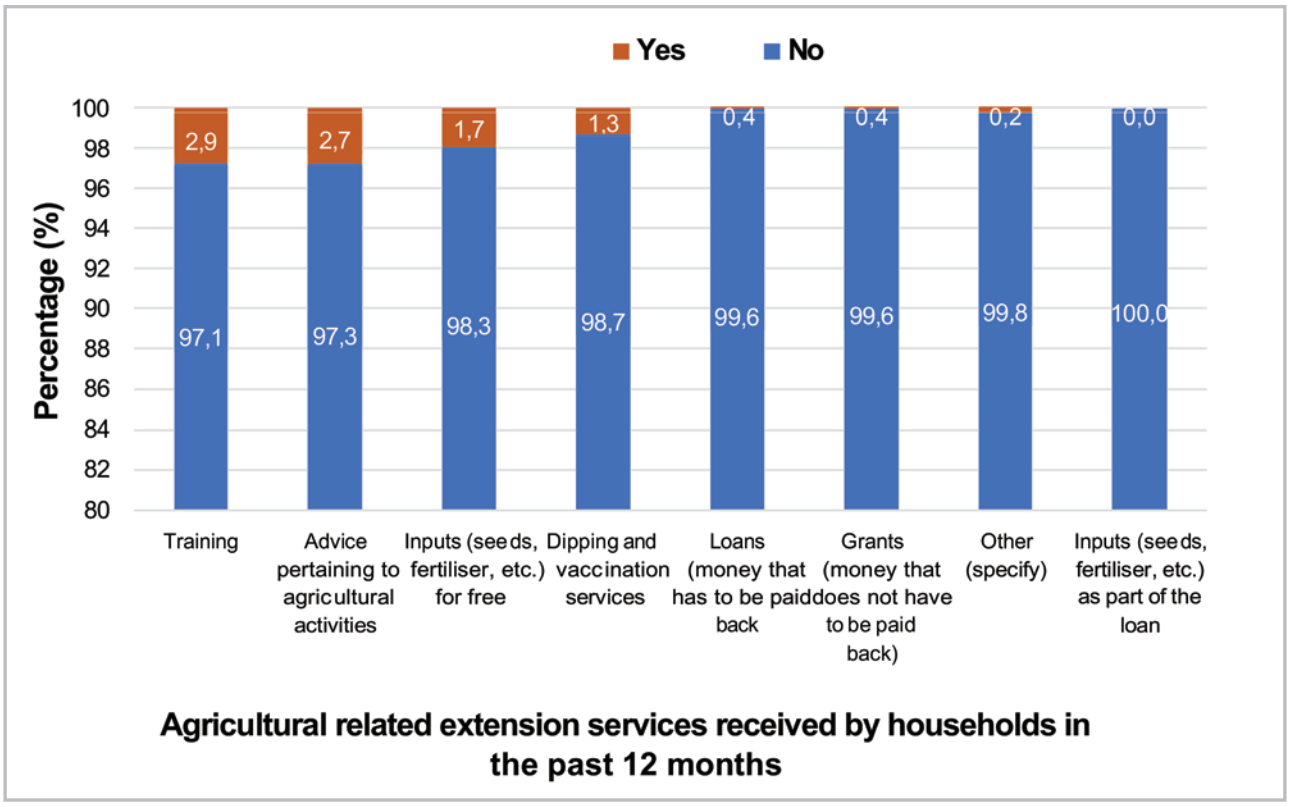


Figure 41: *Agricultural related extension services received by households in the past 12 months*

Table 38: Access to extension services by households

Variable		Access to extension services			
		No		Yes	
		N	Row N %	N	Row N %
Household		**687**	**96**	**29**	**4**
Sex of Household Head	Male	362	94	24	6
	Female	325	99	5	1
Household head age	18-24	14	100	0	0
	25-34	61	96	2	4
	35-44	102	96	5	4
	45-54	166	97	9	3
	55-64	152	94	8	6
	65+	180	97	5	3
District	Fezile Dabi	138	94	7	6
	Lejweleputswa	157	98	4	2
	Mangaung	69	98	1	2
	Thabo Mofutsanyane	208	96	7	4
	Xhariep	115	92	10	8

Discussion

Seasonal variation

The results depicted by the seasonal calendar developed from HEA focus group discussions in Free State Province indicate that the rain season starts from September, stretching over to February with pronounced farming activities of land preparation, planting, and weeding. However, the changing climatic conditions are shifting the planting dates as well as onset of rains within the province. Harvesting of crops and other activities such as gardening starts in March up to around June. Similar season characterisation has been reported in other studies, such as Phokele and Sylvester (2012). Previous studies in the Free State Province have reported that rainfall is highly seasonal, with 95% occurring between October and March (M'marete, 2003), often with a mid-season dry spell during critical periods of growth (FAO, 2009). Midsummer drought often leads to crop failure and low yields (Beukes et al., 1999). Average rainfall is about 800mm, but it often varies temporarily.

Access and land ownership

Generally, there was high levels of access to land reported within the Free State Province across all the districts. Results also indicated that there are high levels of crop production within the province with limited livestock production. These results mirror most of the previous studies that have described Free State Province as the 'Breadbasket' of South Africa. Most of the crops that are dominant include maize, wheat, sunflower, and soya beans.

7 Household Food and Nutrition Security Indicators

This section reports FNS as captured by the HFIAS, HHS, HDDS, and the FCS. These indicators are presented according to districts, sex, age, and other important variables. Correlation analyses are done to investigate the extent to which food security levels, as captured by the various indicators, vary across districts, demographics, and socio-economic characteristics of households.

7.1 Household Food Insecurity Access Scale

The Household Food Insecurity Access Scale (HFIAS) score measures the degree of food access challenges at the household level. It is calculated by adding the households' responses to nine questions asking about the frequency of certain behaviours that signify rising challenges in accessing food in a particular household (Coates et al., 2007). The higher scores indicate more food access challenges, while low scores indicate less food access challenges. The lower bound of the score is 0, while the upper bound is 27. The average HFIAS score for Free State was 9.2, with a range of 0 to 27.

Interpreting this continuous score in terms of its food security implications is not straight forward, necessitating the need to generate categorical indicators of food insecurity (Coates et al., 2007). However, when the HFIAS score is used to categorise households into four levels of food (in)security status (i.e., food secure, mildly food insecure, moderately food insecure, and severely food insecure), the picture becomes less rosy. The food secure category are those households that do not experience food access conditions, and rarely worry about not having enough food. Households in the mildly food insecure category worry about not having enough food sometimes or often, are unable to eat preferred foods, and rarely eat some foods considered undesirable. These households have not cut back on food quantities, and have not experienced most severe access food challenges such as running out of food, going to bed hungry, or going the whole day and night without eating. A moderately food insecure household frequently consumes food that is of low quality, and/or sometimes or often eats undesirable foods, and/or rarely or sometimes reduces quantities of food consumed (i.e., reducing the size of meals or number of meals). A severely food insecure household not only cuts back on meal size or a number of meals often, but also experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating). The cut-off was as follows: food secure if HFIAS is less than or equal to 1, mildly food insecure if HFIAS is between 2 and 8, moderately food insecure if HFIAS is between 9 and 17, and severely food insecure if HFIAS is greater than or equal to 18.

Figure 42 presents the proportion of the prevalence of food insecurity among the sampled households. The overall results showed that most of the households (68.4%) in the Free State Province experienced food insecurity, with only 31.6% found to be food secure. This suggest that households in the province are generally experiencing difficulties in terms of food access. Figure 42 shows that 21.6% of the households were severely food insecure, 27.4% of the surveyed households were moderately food insecure, and 19.4% of the households were mildly food insecure. Overall, the findings of this study slightly differ from the findings of the GHS 2020, which found more proportions of food secure households than the food insecure ones. However, this household food security situation is not strange bearing in mind that the data was collected during the years of the COVID19 pandemic, which may have severely impacted on households' purchasing power and thus increased the proportions of food insecure households. The results are in line with most of the food security findings, which generally indicate that a significant proportion of households' experience food access challenges in South Africa. For example, in 2016, SAVAC commissioned a study on livelihoods, food, and nutrition security in which more households were found to be food insecure than those that were food secure (Ngidi et al., 2016).

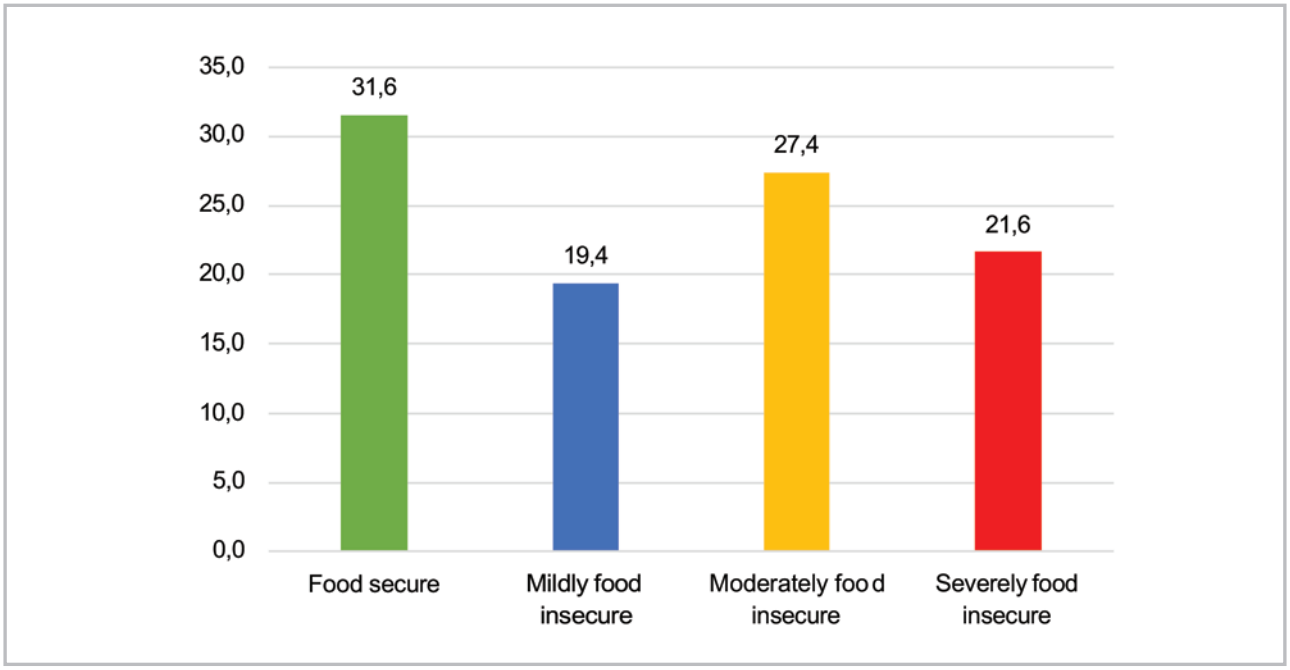


Figure 42: *The categorized food security situation, using HFIAS*

Table 39 and Figure 43 show that the food security status of households was found to be varied by sex and age of household head, as well as by district. The results show that male-headed households were slightly more food secure than female-headed households, with 34% of the male-headed households found to be food secure, compared to only 28% of female-headed households. Similarly, Negesse et al. (2020) also found that the severity of food insecurity among female-headed households in Ethiopia was higher as compared with their men counterparts. In any category of the HFIAS but moderately food insecure, female-headed households experienced slightly higher levels of food insecurity. Severe food insecurity was experienced by 20% of the male-headed households compared to 24% of the female-headed households that fell within the same category. Approximately 28% and 27% of male- headed and female-headed households experienced moderate food insecurity, respectively. About 18% and 21% of male-headed and female-headed households experienced mild food insecurity, respectively.

Table 39: District level and gendered food security situation as determined by HFIAS

		Food secure		Mildly food insecure		Moderately food insecure		Severely food insecure	
		N	Row N %	N	Row N %	N	Row N %	N	Row N %
Sex of the Household Head	Male	505	34	280	18	382	28	290	20
	Female	348	28	245	21	344	27	308	24
Household head age	18-24	44	41	21	23	18	17	19	19
	25-34	127	34	64	16	90	27	80	23
	35-44	162	31	104	20	149	30	105	19
	45-54	169	28	101	18	157	28	145	25
	55-64	137	27	113	21	157	30	129	23
	65+	192	36	112	20	146	26	107	19

		Food secure		Mildly food insecure		Moderately food insecure		Severely food insecure	
		N	Row N %	N	Row N %	N	Row N %	N	Row N %
District	Fezile Dabi	135	28	106	21	147	30	113	21
	Lejweleputswa	138	25	98	16	202	34	145	25
	Mangaung	200	38	107	21	117	23	89	18
	Thabo Mofutsanyane	180	32	111	20	144	25	129	23
	Xhariep	205	41	104	18	116	20	123	21

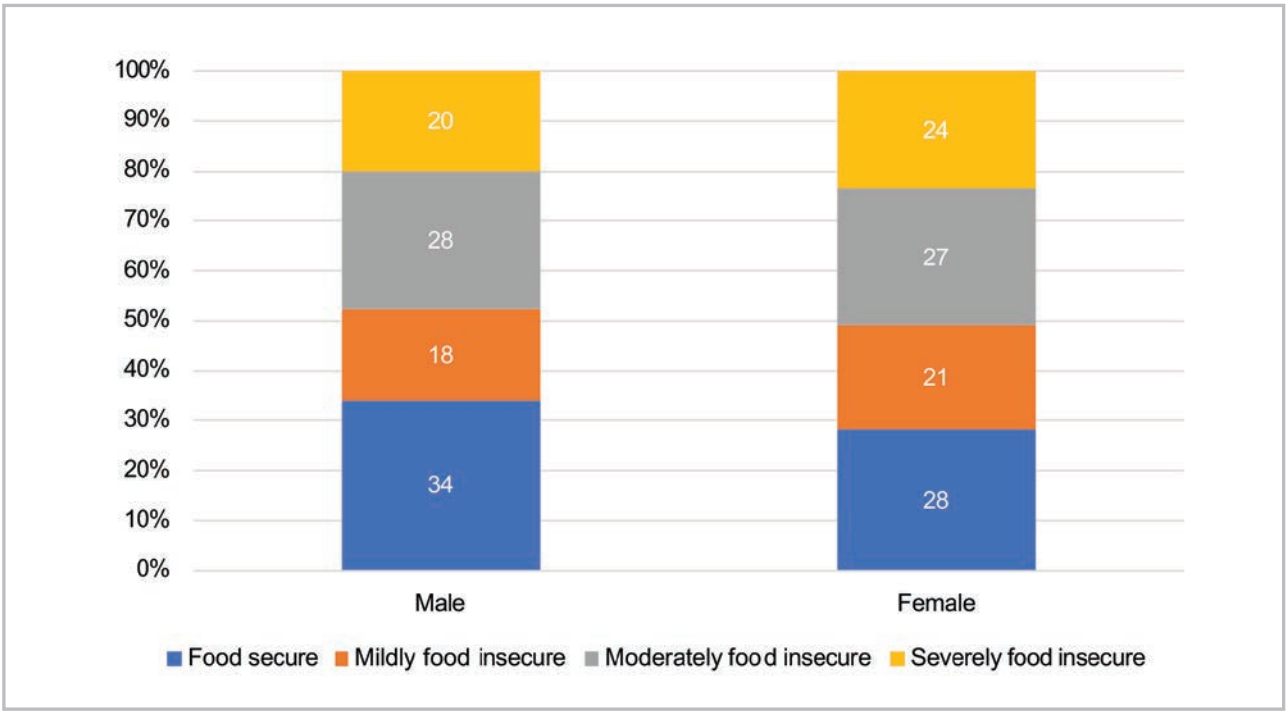


Figure 43: *Food security status by sex of household head*

Table 39 and Figure 44 show that households headed by the 18-24 years age group had the highest proportion of households (41%) who were food secure. They were followed by those households headed by the 65+ years age group, with 36% of the households headed by this age group found to be food secure. The least food secure age group was found to be the 55-64 years age group. This same group was found to be the second most severely food insecure age group, with 23% of the households headed by this age group found to be severely food insecure. The most severely food insecure age group was found to be in the 45-54 age group, with 25% of the households in the age group being severely food insecure.

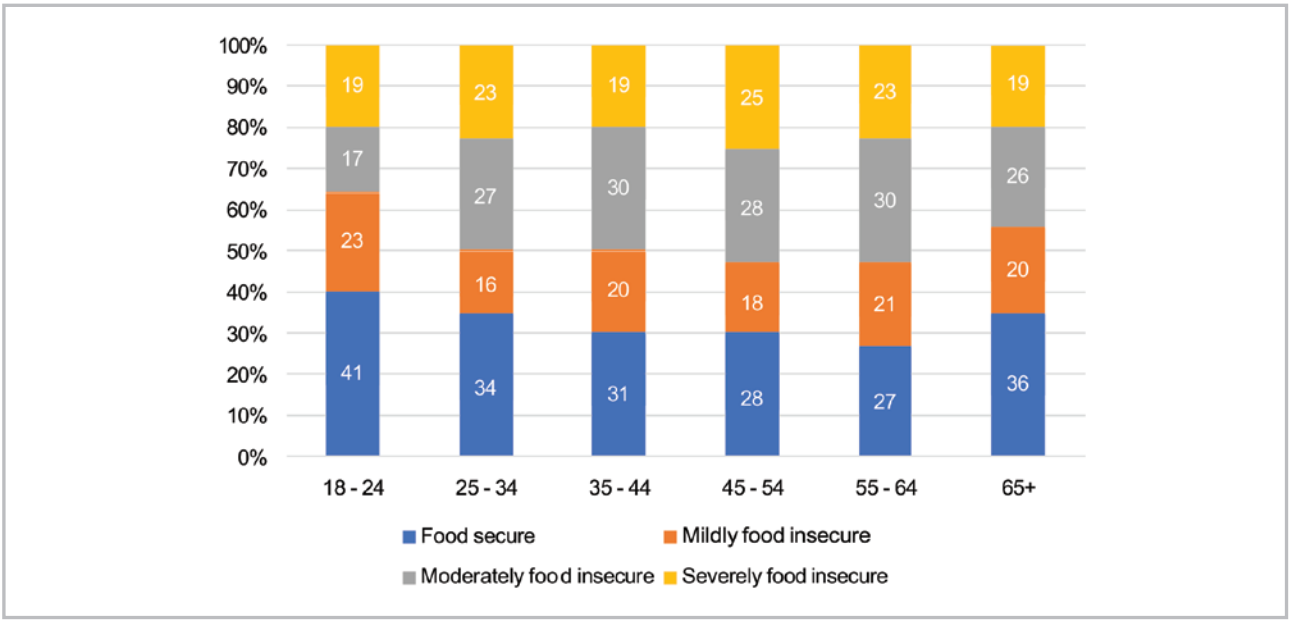
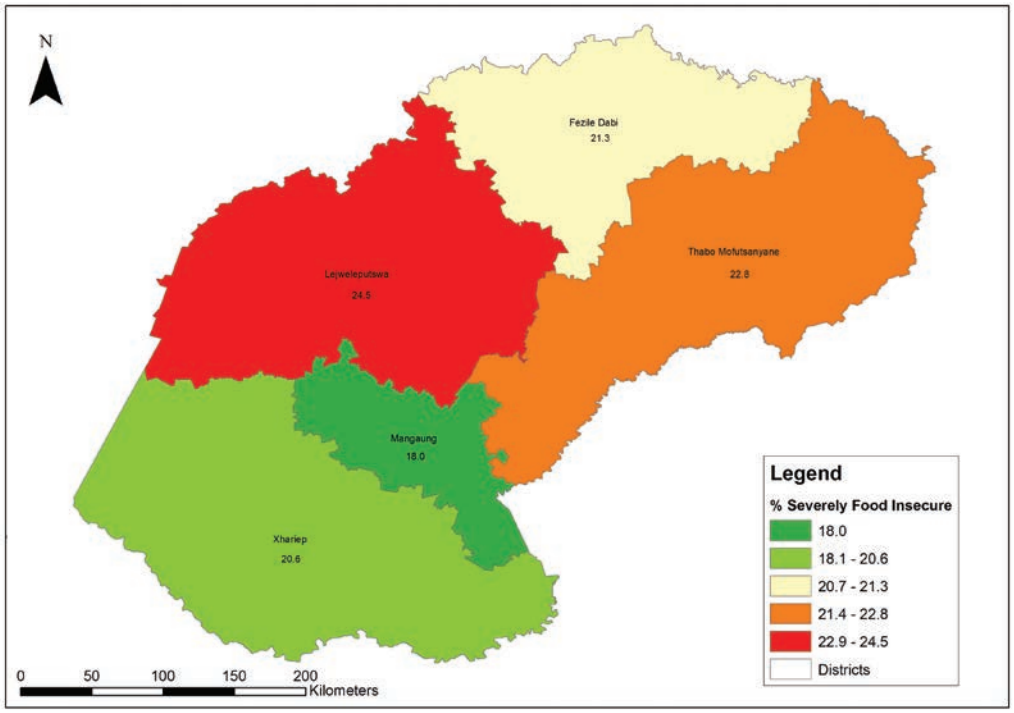


Figure 44: *Food security status by age group of household head*

Table 43 and Figure 45 show that the Xhariep District had the highest proportion of households that were food secure (41%), followed by Mangaung District, with 38% of the households that were found to be food secure. The least food secure district was found to be Lejweleputswa, with 25% of the households found to be food secure. The Lejweleputswa District also had the highest proportion of households experiencing severe food insecurity. About 25% of the households in Lejweleputswa District were severely food insecure. This was followed by households from Thabo Mofutsanyane District, 23% of the households were severely food insecure. About 21% of the households in Fezile Dabi and Xhariep districts also experienced severe food insecurity, while another 18% of the severely food insecure households were from Mangaung District. Moderate food insecurity was largely experienced by households from Lejweleputswa District, where 34% of the households were moderately food insecure. This was followed by households from Fezile Dabi District, where 30% of the households were reported to have experienced moderate food insecurity. Mild food insecurity was largely experienced by households from Fezile Dabi and Mangaung districts, where 21% of the households from each district experienced mild food insecurity.



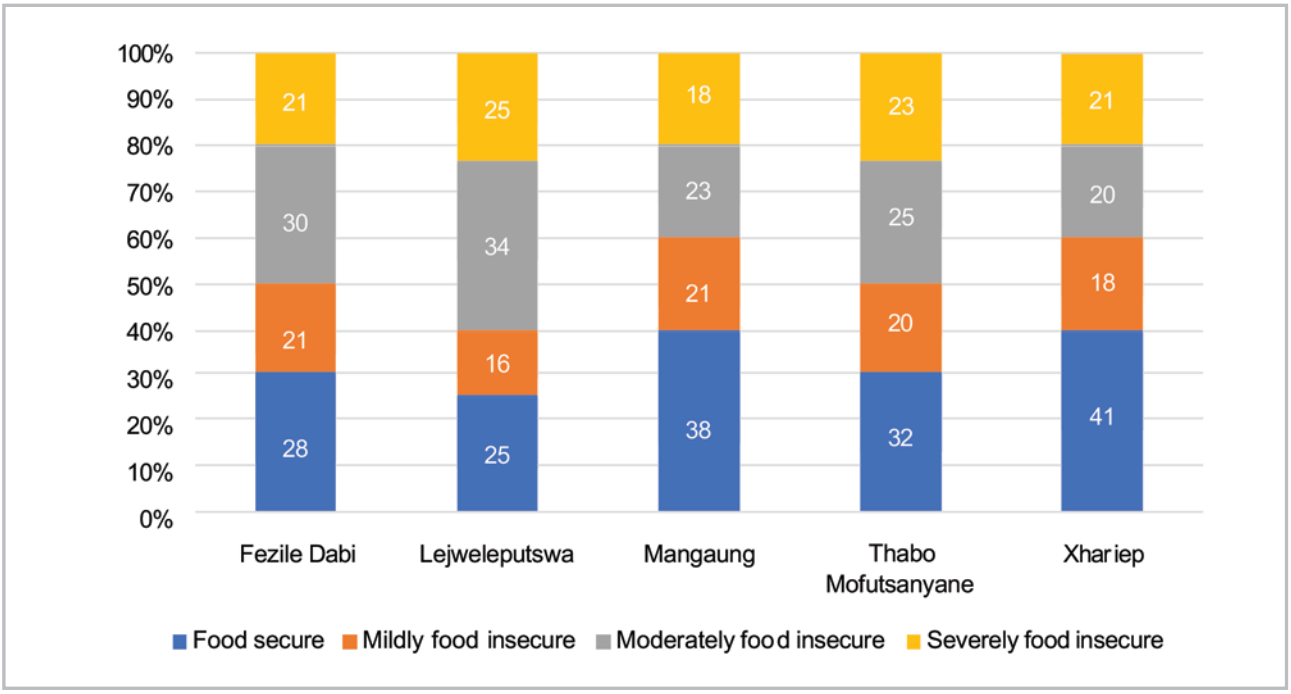


Figure 45: *Food security status by district*

7.2 Household Hunger Scale

The Household Hunger Scale (HHS) is a household food deprivation scale that is derived from selected HFIAS questions for use mainly in situations of high food insecurity levels. Figure 46 presents the results of the HHS scale, showing that most of the sampled households experienced little to no hunger (73.7%). About 19.1% of the households and 7.2%, respectively, experienced moderate hunger and severe hunger. While a considerable proportion of households experienced food insecurity (as shown by the HFIAS results), the HHS suggests that the level of food deprivation is not very severe for most of the households in the Free State.

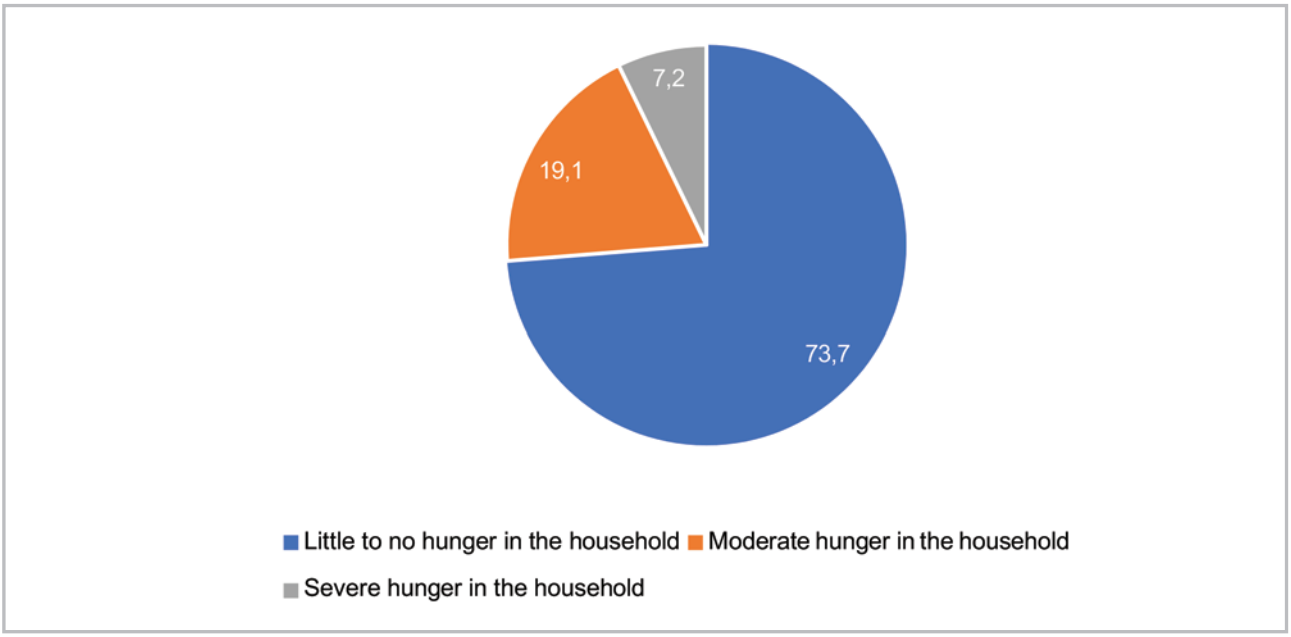


Figure 46: *Hunger experiences of households*

Table 40 presents the hunger status of households by sex, age, and district. The Table 40 and Figure 47 show that the hunger status generally did slightly differ between male-headed and female-headed households across all the categories of the HHS.

Table 40: Food security situation, using HHS

		Little to no hunger in the household		Moderate hunger in the household		Severe hunger in the household	
		N	Row N %	N	Row N %	N	Row N %
Sex of household head	Male	1183	75	265	17	118	8
	Female	959	72	285	21	99	7
Household head age	18-24	89	81	13	11	10	8
	25-34	278	72	73	19	33	10
	35-44	418	74	104	20	43	7
	45-54	451	74	114	18	45	7
	55-64	407	71	127	23	39	6
	65+	457	75	111	18	38	6
District	Fezile Dabi	412	75	102	19	34	6
	Lejweleputswa	447	72	119	19	55	9
	Mangaung	433	77	88	17	30	6
	Thabo Mofutsanyane	430	70	134	22	47	8
	Xhariep	426	75	108	17	51	8

Table 40 and Figure 47 indicated that 75% of the male-headed households experienced little to no hunger, compared to 72% of the female-headed households. The proportion of female-headed households (21%) was higher than that of male-headed (17%) in the moderate hunger category. Severe hunger in the household was slightly higher among male-headed (8%) than among female-headed households (7%).

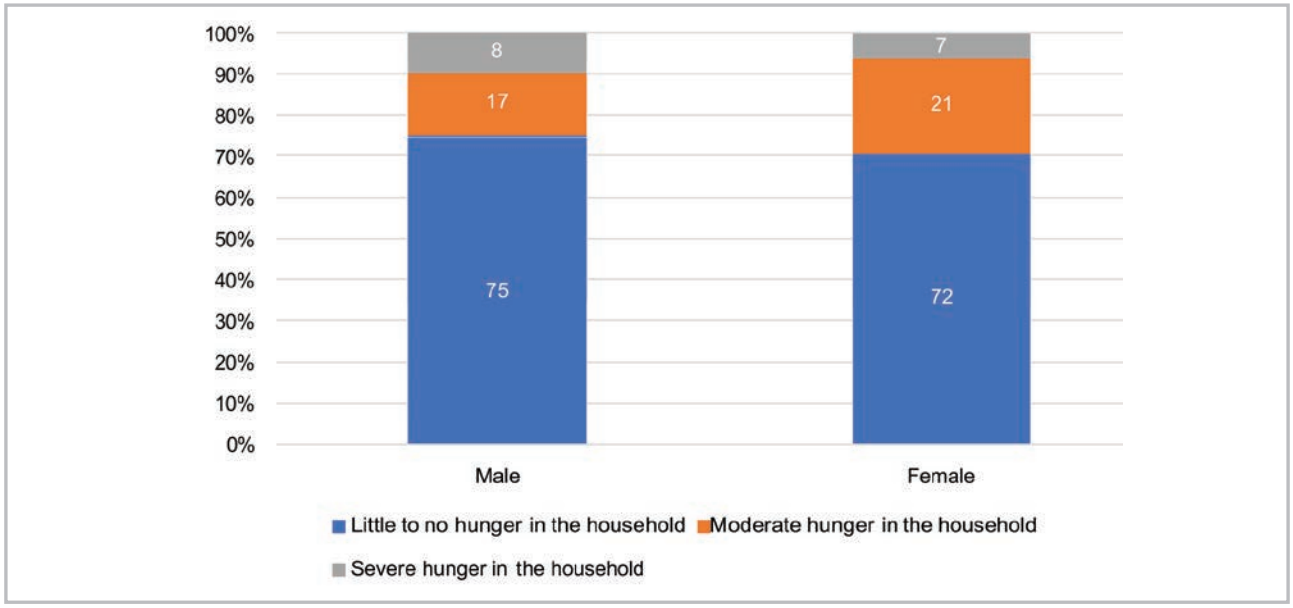


Figure 47: *Household hunger status by sex of household head*

The most food secure age group was found to be 18-24 years, with 81% of the households headed by this age group experiencing little to no hunger in the household. This was followed by households headed by members in the age group of 65 years and above (Figure 48). Households in the age group of 55-64 years experienced relatively more moderate hunger compared to the other age groups, with 23% of the households

in this age category experiencing moderate hunger. This was followed by households in the age categories of 35-44 years and 25-34 years, where 20% and 19% of the households experienced moderate hunger in their households. Severe hunger in the household was largely experienced by 25-34 years, with 10% of the household's heads in this age found to be experiencing severe hunger.

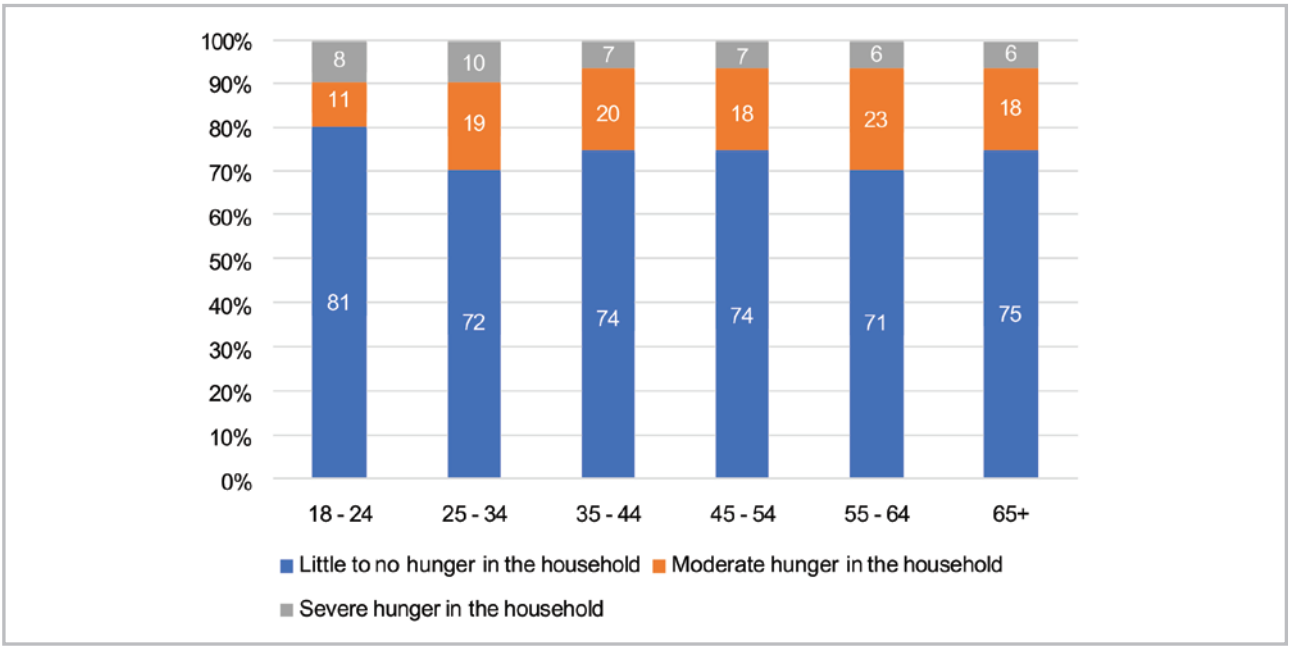


Figure 48: Household hunger status by age group of household head

There were minor variations in the hunger status of households across the five districts in the Free State Province. Mangaung District was the most food secure district, with 77%of the households found to have experienced little to no hunger. This was followed by the Fezile Dabi and Xhariep districts, with 75% of the households from each of the districts found to have experienced little to no hunger. In terms of the HHS, the Thabo Mofutsanyane District was slightly the least food secure, with 70% of the households experiencing little to no hunger compared to others which had slightly higher percentages. More households in Thabo Mofutsanyane District (22%) also experienced moderate levels of hunger compared to the other four districts. Overall, there were slight differences in the proportion of households who experienced severe hunger in the five districts, ranging from 6% to 9%. Households from Lejweleputswa District experienced more severe hunger compared to other districts.

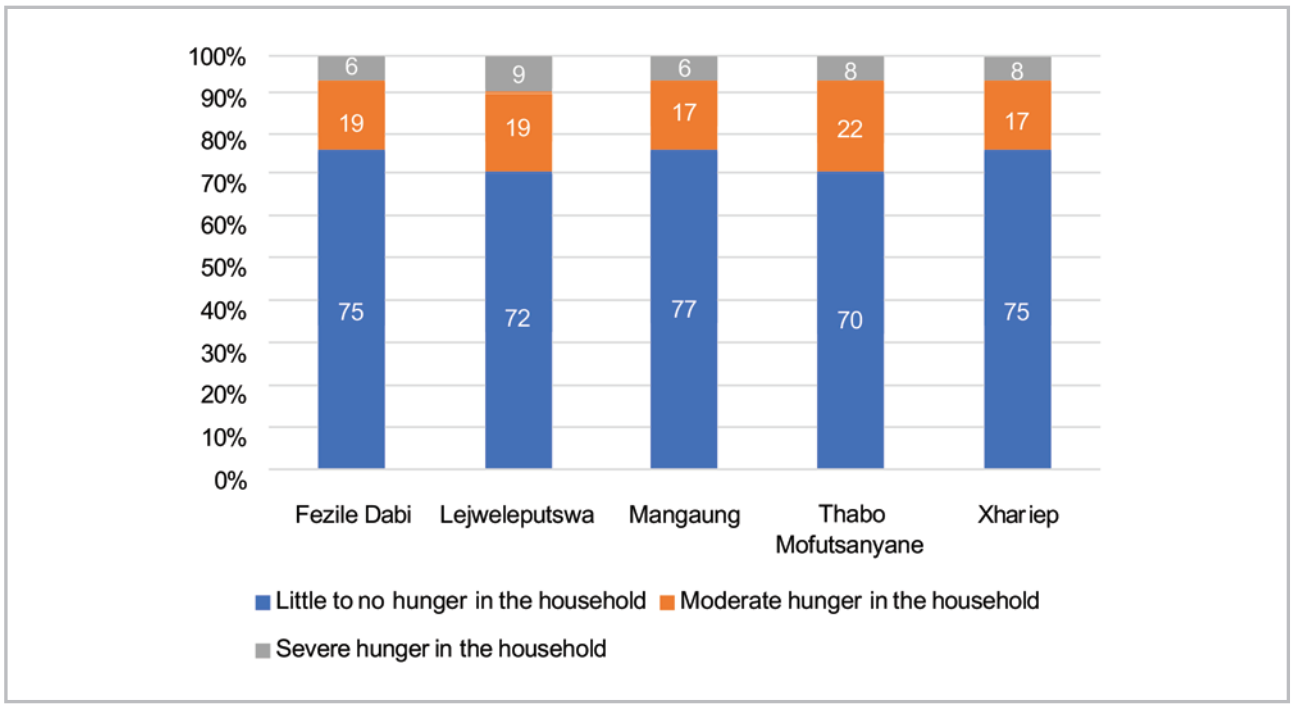


Figure 49: *Household hunger status by district*

7.3 Household Dietary Diversity Score (HDDS)

HDDS measures the economic ability of a household to access a variety of foods (Kennedy, 2011), and higher levels of HDDS imply improved chances of a household to consume enough of all food components necessary for good health. HDDS was constructed using the number of food groups consumed by the household over a 24-hour recall. The food items were categorized into 12 different food groups.

Figure 50 shows that, on average, the households in Free State consumed more than 7 out of 12 food groups, which suggests above-average dietary diversity levels. Using the cut-offs suggested by Kennedy (2011), 68.2% of households consumed highly diverse diets (more or equal to 6 food groups), whilst 22.9% and 8.9% of the households consumed medium dietary diversity (4-5 food groups) and low diverse diets (less or equal to 3 food groups), respectively.

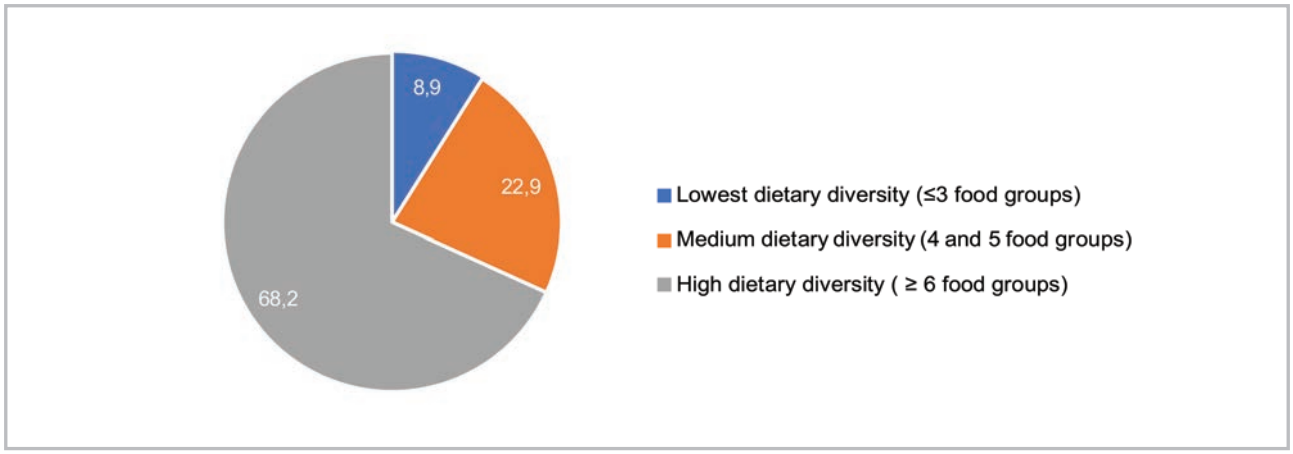


Figure 50: *Household Dietary Diversity Scores*

The results in Table 41 and Figure 51 show that 9% of both male-headed and female-headed households had the lowest dietary diversity. More female-headed (70%) than male-headed (66%) households were in the category of highest dietary diversity, suggesting that they had better access to diversified food. More male-headed households consumed about 4 and 5 food groups (medium dietary diversity), with 25% of male-headed households compared to 21% of the female-headed households. Concluding within the context of this tool, these results generally suggest that both male-headed and female-headed households have better access to diversified food.

Table 41: Household Dietary Diversity Scores

		Lowest dietary diversity (≤ 3 food groups)		Medium dietary diversity (4 and 5 food groups)		High dietary diversity (≥ 6 food groups)	
		N	Row N %	N	Row N %	N	Row N %
Sex of Household head	Male	144	9	382	25	1031	66
	Female	113	9	279	21	945	70
Household head age	18-24	13	11	22	18	77	71
	25-34	37	10	91	23	255	67
	35-44	49	9	137	24	375	67
	45-54	50	8	141	24	416	68
	55-64	57	10	118	21	394	69
	65+	44	7	132	22	428	71
District	Fezile Dabi	34	6	103	19	410	75
	Lejweleputswa	37	6	158	25	425	69
	Mangaung	56	10	133	24	353	66
	Thabo Mofutsanyane	78	12	137	23	387	65
	Xhariep	52	8	130	24	403	68

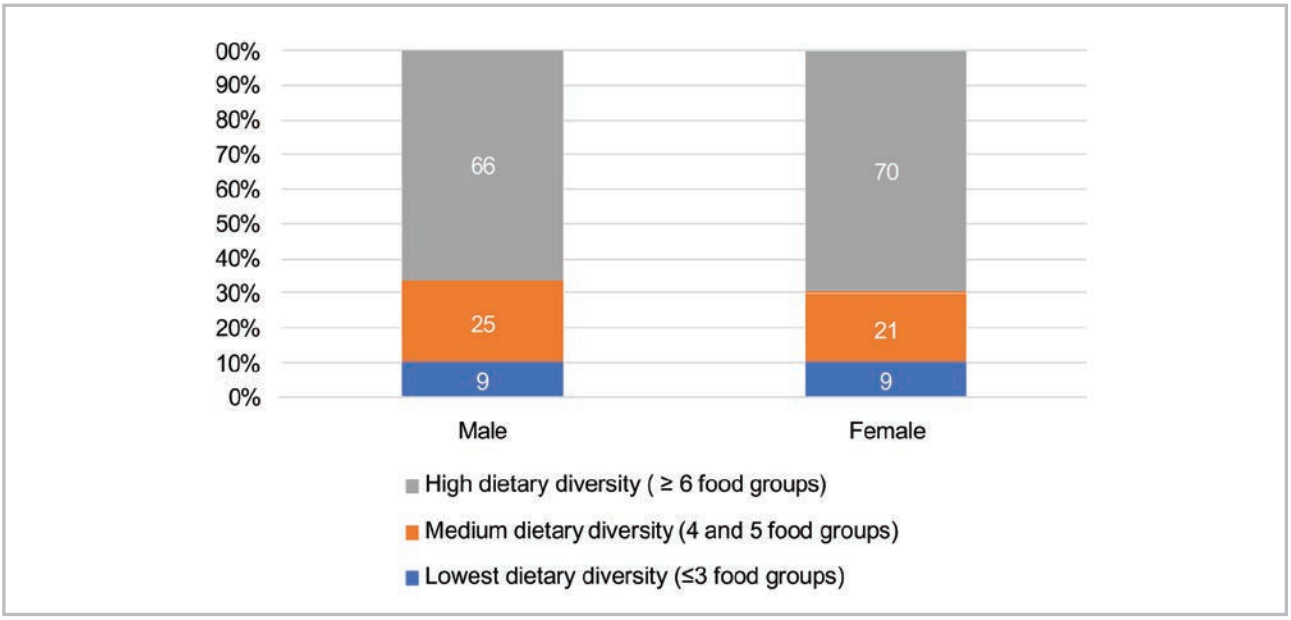


Figure 51: *Dietary Diversity Score category by sex of household*

In terms of the age groups, most of all age groups generally consumed a high dietary diversity, with results showing all age groups having a higher percentage of 67% or above of households that consumed highly diversified food. Results of the age groups also show that household heads aged 18-24 and 65+ years were the ones that largely consumed the highest dietary diversity, with 71% of the households from each age group found to have consumed the highest dietary diversity (Figure 52). Generally, households from different districts had the highest dietary diversity with 60% or more found to be in the category of high dietary diversity (Figure 53). But households in Fezile Dabi District had the highest dietary diversity, with 75% of the households from this district having consumed highest dietary diversity. Most households with the, lowest dietary diversity were in Thabo Mofutsanyane District. These results should be taken with caution because with 24-hour recall, it is possible to find the situation looking good in terms of food variety simply because the previous day, it was pension day.

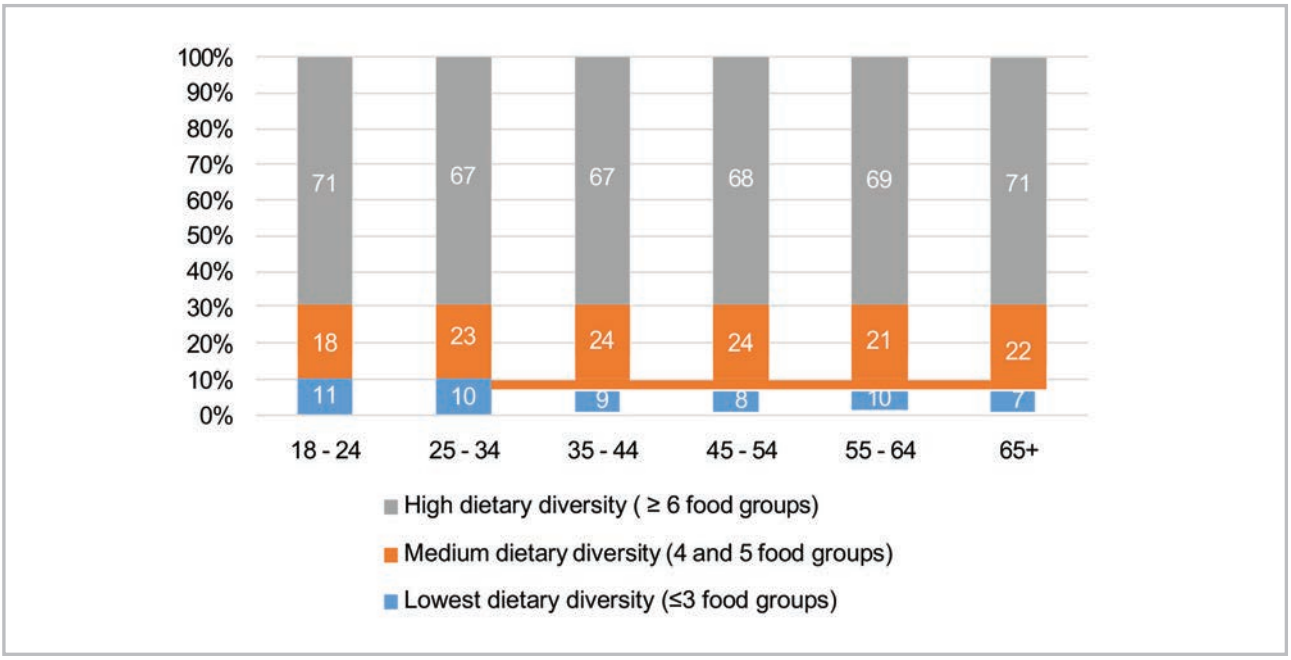


Figure 52: *Dietary diversity category by age of household head*

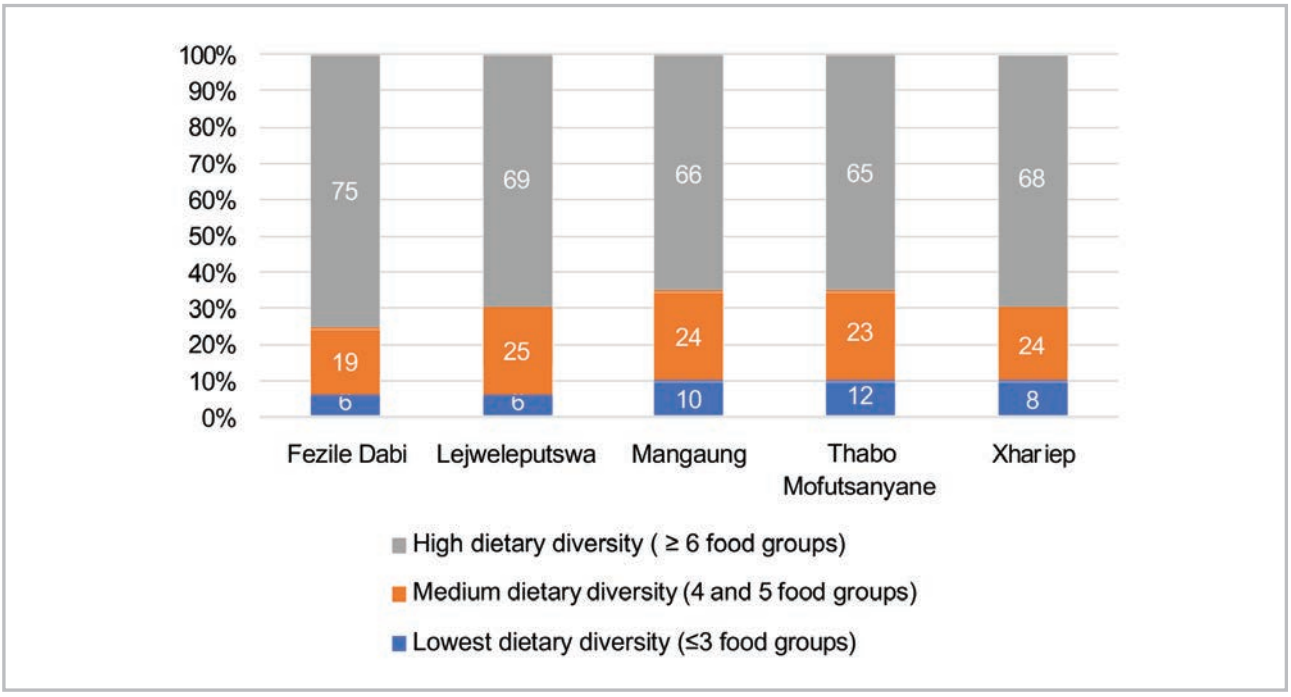


Figure 53: *Dietary diversity category by district*

HDDS should not be interpreted as a measure of nutrition or diet quality, as achieving a high dietary diversity score does not guarantee that important food groups, such as fruits and vegetables, are included in the diet. A household can lack crucial micro-nutrients even when consuming a diverse diet. Figure 54 shows the food groups and their frequency of consumption by the households. The figure shows that the most popular food groups were cereals, condiments, sugars, oils and fats, meats, milk and milk products, other vegetables, roots and tubers, eggs, orange fresh vegetables, other fruits, fish and sea foods, orange-coloured fruits, and pulses and nuts. The least consumed food groups were organ meat, dark green leafy vegetables, orange-coloured fruits, pulses and nuts, fish and sea foods, orange fresh vegetables, and other fruits. Figure 54 shows that the most consumed food groups were mostly the less healthy ones, providing a different light to Figure 54, which gives an impression of a highly diverse and healthy diet.

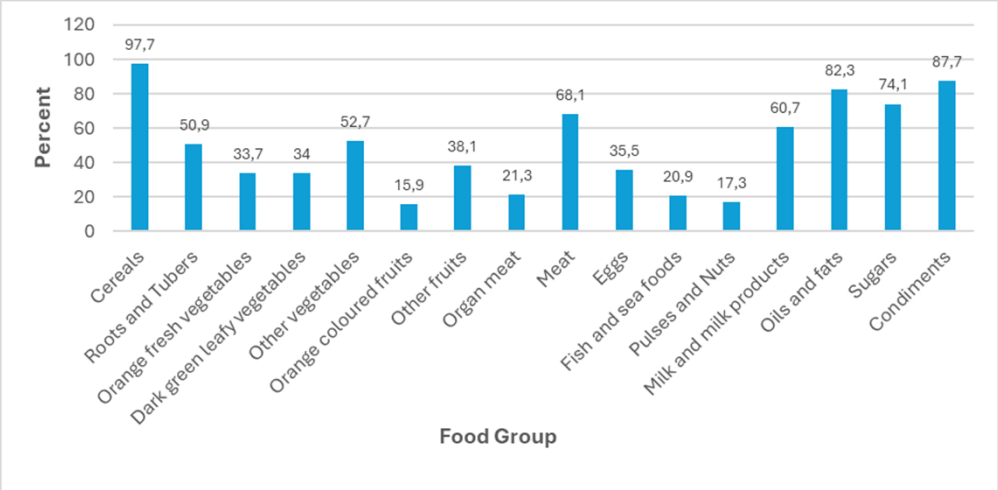


Figure 54: *Frequency of food group consumption*

7.4 Food Consumption Score

Food Consumption Scores (FSC) were calculated using the WFP methodology to further understand the levels of dietary diversity in the study areas. This FCS differs from Dietary Diversity in that it represents a weighted dietary diversity score.

Figure 55 shows that 37.3% of the households were consuming adequately (acceptable) diversified diets and 37.8% of households are at the borderline and could fall into unacceptable diversity of foods if no actions are taken to help them improve their diets. Results further indicate that 24.9% of the households consumed poor diets. This is most concerning because more than half (62.7%) of households were not consuming acceptable diets, and this may lead to nutrition-related problems.

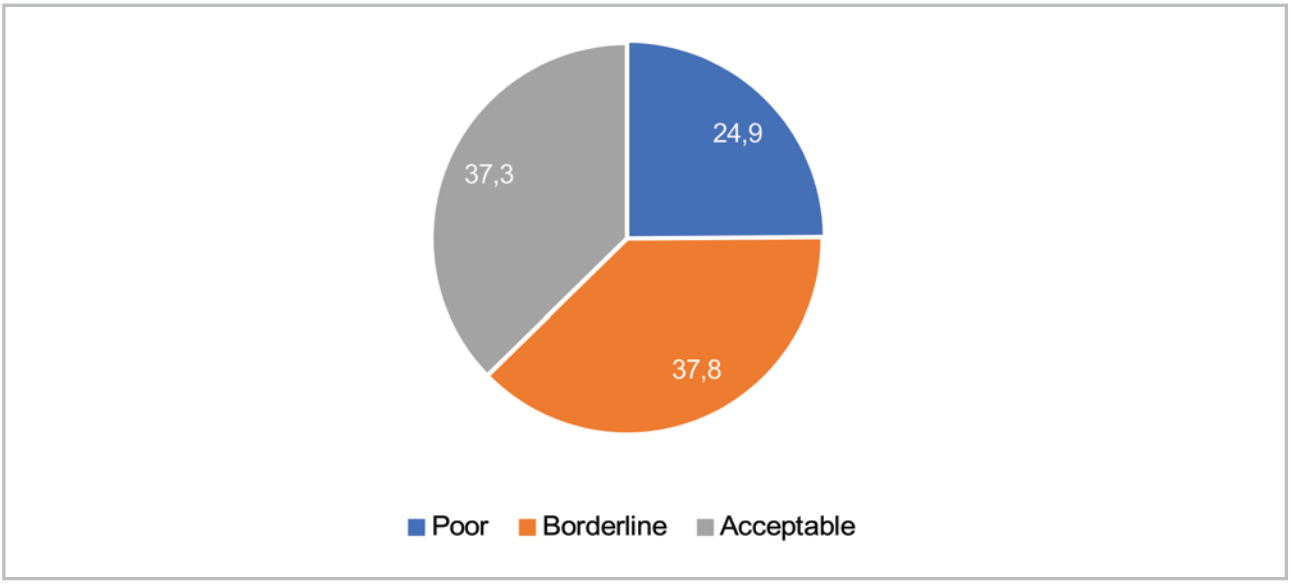


Figure 55: *Food consumption score*

Results in Table 42 presents the food consumption score categories according to sex, age, and district.

Table 42: Food Consumption Score by sex, age of household head, and district

Variable		Poor		Borderline		Acceptable	
		N	Row N %	N	Row N %	N	Row N %
Sex of the household head	Male	196	25	283	35	297	40
	Female	163	25	277	41	206	34
Household head age	18-24	22	30	22	34	23	35
	25-34	48	22	79	43	63	36
	35-44	76	28	101	34	95	38
	45-54	63	21	124	42	100	38
	55-64	66	23	102	35	110	42
	65+	68	24	120	40	99	35
District	Fezile Dabi	65	17	201	53	109	30
	Lejweleputswa	125	29	173	42	117	29
	Mangaung	48	24	43	23	97	53
	Thabo Mofutsanyane	63	28	53	25	104	48
	Xhariep	64	26	90	41	76	33

Table 42 and Figure 56 presents the results showing the relationship between the sex of household head and food consumption category. The results indicate that male-headed households had more acceptable diets compared to female-headed households. About 40% of the male-headed households were found to have consumed acceptable diets compared to 34% of the female-headed households. Female-headed households were found in marginally higher proportions in the borderline category, while in the poor category, both female-headed and male-headed households were at sitting at 25 percent.

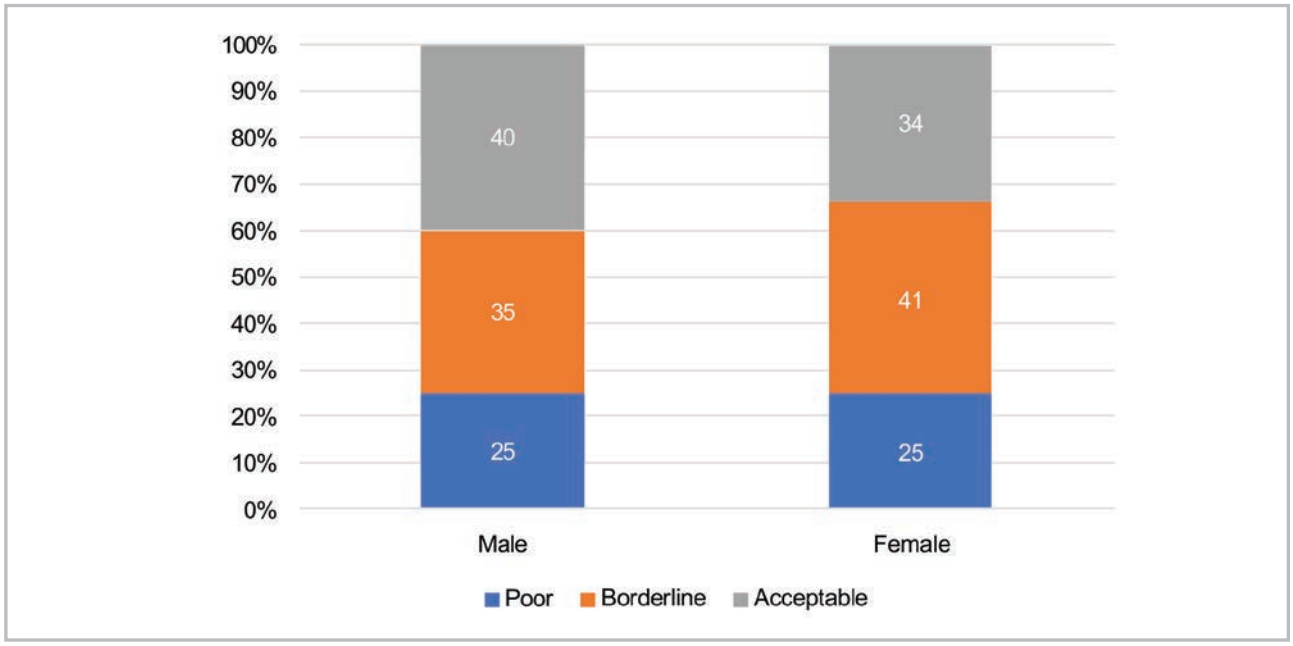


Figure 56: *Food consumption category by sex of household head*

The relationship between the age of household head and the chances of consuming acceptable diets was not linear (Figure 56). With the exception of the age group 65+ years, the proportion of households who consumed acceptable diets increased from 35% among the household heads aged 18-24 to 42% among households aged 55- 64 years, then 35% for the households in the age group of 65+ years. The most households in the borderline were in the age groups of 18-24, followed by households in the age group of 35-44 years. Most households with poor diets were in the age group of 18-24.

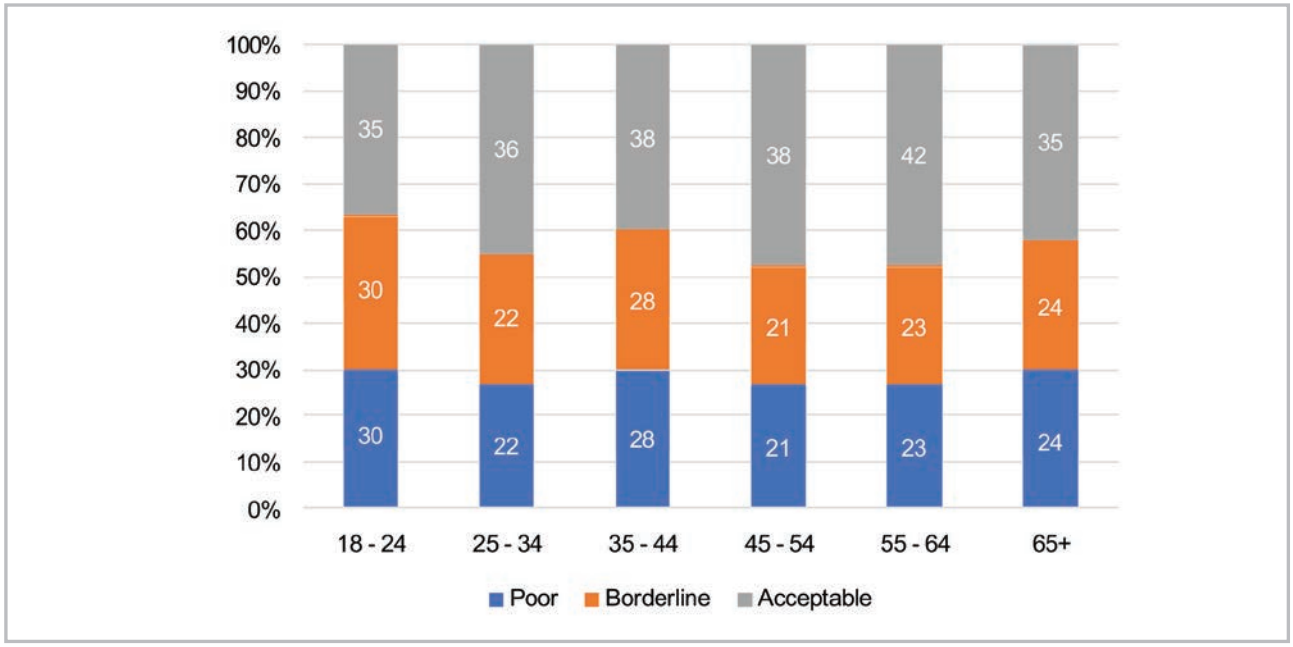


Figure 57: *Food consumption category by age of household head*

More households (29%) with poor diets were found in Lejweleputswa District. This was followed by Thabo Mofutsanyane and Xhariep districts, with 28% and 26% of the households in this category, respectively (Figure 58). Households from the Mangaung District consumed diverse diets compared to the other districts, with 53% of the households in this category. The highest number of households on the borderline were from Fezile Dabi District, followed by Lejweleputswa District.

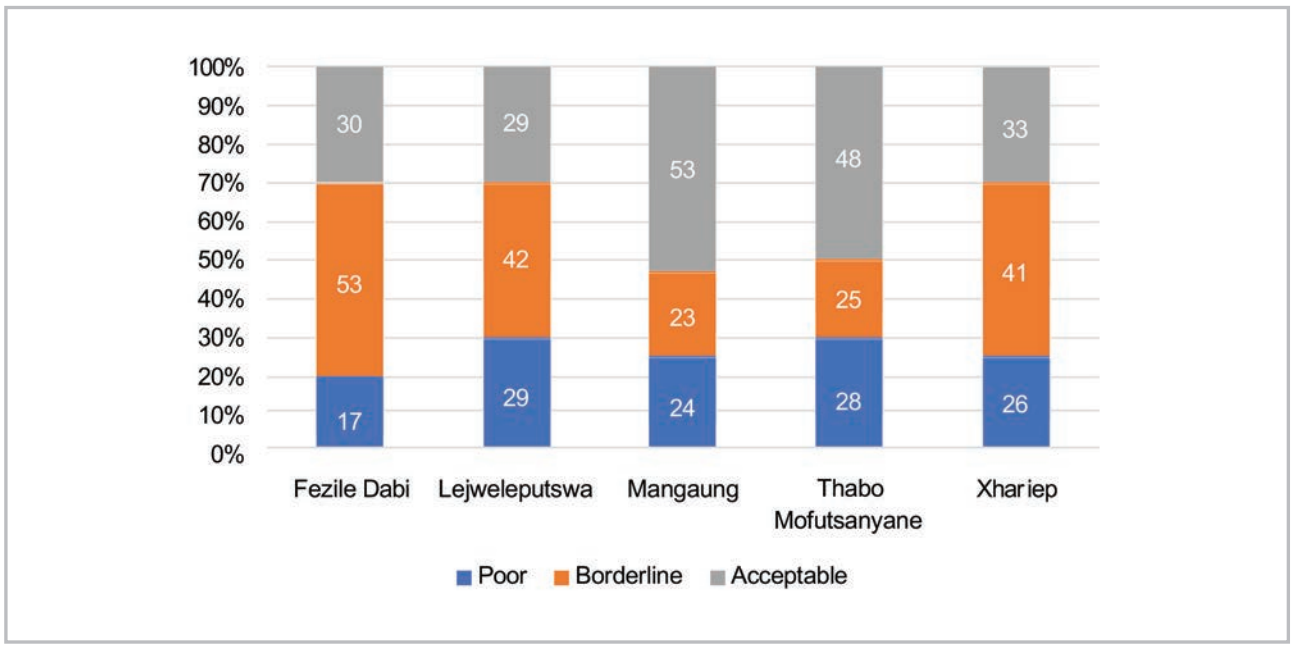


Figure 58: *Food consumption category by district*

7.5 Food Expenditure

The food expenditure approach captures food security in terms of the amount of money spent by a household to acquire food, and whether that amount is above or below the food poverty line. The food poverty line, commonly referred to as the 'extreme' poverty line, refers to the amount of money that an individual will need to afford the minimum required daily energy intake (Stats SA, 2021). In 2021, the food poverty line was R624 per person per month (Stats SA, 2021). On average, the households' food expenditure per person per month in the Free State Province was R528.74, which is below the food poverty line (Figure 59). Using the 2021 food poverty line (i.e., R624), Figure 46h shows that 73% of the households were below the food poverty line. This indicates very high levels of food poverty, which supports the results of the HFIAS results.

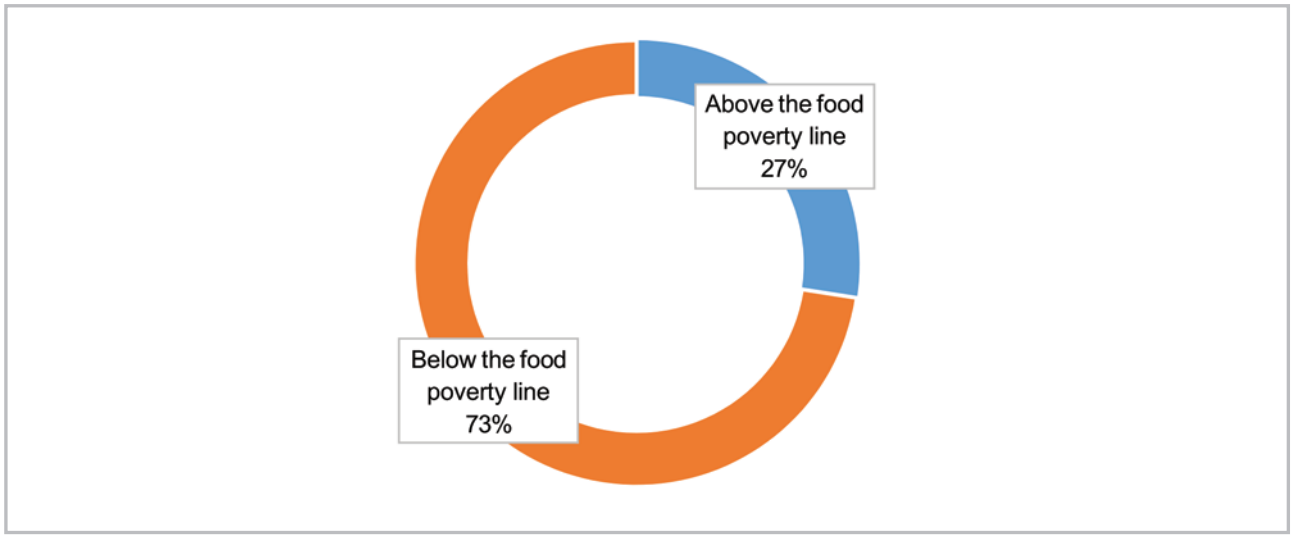


Figure 59: *Food poverty levels in the Free State Province*

The food expenditure and poverty levels varied by sex, age group and district (Table 43). The Table shows that a higher proportion of female-headed households (78.1%) were below the food poverty compared to male-headed households (65.5%). Across the age-groups, the results show a positive relationship between food poverty and age, with poverty increasing as the age of household head increased. For example, while 44.0% of the households headed by the 18-24 years age group experienced food poverty, more than three quarters of households headed by the 45+ years age group were in food poverty. Food poverty was more prevalent in Thabo Mofutsanyana District (76.8%), Lejweleputsa District (76.6%), and Fezile Dabi District (72.4%). Xhariep District (66.2%) and Mangaung District (66.4%) experienced marginally less food poverty, relative to the other three districts.

Table 43: Food expenditure per capita per month by sex, age group, and district

Variables		Percentage above FPL	Percentage below FPL
All sample		27.4	72.6
Household head Sex	**Male**	33.1	66.9
	Female	20.8	79.2
Household head Age group	18-24	56.0	44.0
	25-34	33.8	66.2
	35-44	31.1	68.9
	45-54	23.7	76.3
	55-64	22.5	77.5
	65+	22.2	77.8
District	Fezile Dabi	27.6	72.4
	Lejweleputsa	23.4	76.6
	Mangaung metro	33.6	66.4
	Thabo Mofutsanyana	23.3	76.8
	Xhariep	33.8	66.2

7.6 Relationship between Household Food Security situation and Socio-economic Factors

Household food security varies according to demographics, socio-economic characteristics, and support levels. This section presents results investigating the extent to which food security status of households differs according to several factors. For this analysis, the HFIAS categories were merged into a binary food security status variable, indicating whether a household was food secure or food insecure. The three food insecurity categories (i.e., mild, moderate, and severe levels) were all captured as food insecure. Table 41 presents the results. The table shows that significant relationships were found between household food security status and some demographics and socioeconomic factors such as gender, age of household heads / acting head, access to irrigation, improved water source, sanitation, social grants, household size, markets, education level of household head / acting head, and involvement in agricultural production.

Table 44: Relationship of food security and socio-economic factors

Variables	Categories	Food security status		t / Chi-square tests
		Food secure	Food insecure	
HH Sex	Male	34.1	65.9	***
	Female	28.1	71.9	
HH age group	18-24	41.1	58.9	***
	25-34	33.7	66.3	
	35-44	30.5	69.5	
	45-54	28.3	71.7	
	55-64	26.6	73.4	
	65+	35.7	74.3	
Marital status	Married	32.3	67.7	***
	Unmarried	30.6	69.4	
District	Fezile Dabi	28.1	71.9	***
	Lejweleputswa	24.9	75.1	
	Mangaung	37.8	62.2	
	Thabo Mofutsanyane	32.0	68.0	
	Xhariep	41.3	58.7	
HH education level	No schooling	26.3	73.7	***
	Primary	23.7	76.3	
	Matric	30.7	69.3	
	Tertiary	66.5	33.5	
Household size	2.89	3.49	4.4	***
HH employment status	Employed	41.2	58.8	***
	Unemployed	26.9	73.1	
Access to social grants	Beneficiary	24.1	75.9	***
	Non-beneficiary	37.4	62.6	
Access to land	Yes	28.6	71.4	
	No	37.6	62.4	***

Variables	Categories	Food security status		t / Chi-square tests
		Food secure	Food insecure	
Involved in farming activities	Yes	25.9	74.1	
	No	33.0	67.0	***
Access to irrigation	Yes	27.8	72.2	
	No	20.6	79.4	***
Access to extension	Yes	32.4	67.6	
	No	26.6	73.4	***
Access to markets	Yes	27.8	72.2	
	No	18.0	82.0	***
Access to road infrastructure	Yes	28.1	71.9	
	No	20.1	79.9	***
Location type	Urban, formal & informal	30.9	69.1	
	Rural, Traditional areas	29.1	70.9	***
	Farms	42.1	57.9	
Access to improved water sources	Yes	31.4	68.6	***
	No	17.7	82.3	
Access to improved sanitation	Yes	31.9	68.1	***
	No	21.6	78.4	

Table 44 shows female-headed households were significantly more likely to be food insecure than male-headed households. Among male-headed households, 65.9% were food insecure, while 71.9% were food insecure among female-headed households. This result is not strange, as females generally have disadvantages in accessing productive resources in traditional communities due to various reasons, among others, the historical formulation and implementation of patrilineal laws and cultural traditions, including laws that limit females' inheritance of productive assets such as land. Further, there is often social and administrative bias towards males, as well as unequal access to education, extension services, training, information, and inputs, which limits the livelihood options for females, compounding the food security plight of their households. The age of a household head also significantly varied with the food status of their households, with the average age of households in the food secure category marginally lower than that of those in the food insecure category. The relationship between age and food insecurity was positive, with the proportion of food insecure households increasing as the age of household heads increased.

Households in the food secure category had fewer household members than those in the food insecure category, and this difference was statistically significant. This was expected, since more members imply more mouths to feed, thus a greater burden than in smaller ones. While bigger households can be a source of labour, the results suggest that the consumption burden dominates the labour availability dimension. Table 44 shows a positive and significant relationship between the education level of household heads and household food security. The proportion of food secure households increased significantly as education levels also increased. For example, while about 23.7% of households headed by people with primary education were food secure, more than two thirds (66.5%) of households headed by people with tertiary qualifications were

food secure. Educated people have higher opportunities and higher chances of success in their endeavours, which leads to higher welfare. Also, higher education among farming communities, such as those in the Free State Province, could lead to better information access and assimilation, which may increase awareness of the possible advantages of modernizing agriculture by means of technological inputs or simply taking advantage of opportunities arising in the area. This leads to higher productivity, food production, and incomes. Even though increasing education is associated with increasing chances of being food secure, the results indicate that it is only after a household head attains a tertiary qualification that education plays a decided role in ensuring food security. The food insecure households dominate among those with education level attainments of matric and below, with food secure households becoming the majority for those in the tertiary qualification category.

The results show that access to land, as well as involvement in farming activities, did not play a crucial role in the food security status of households. Households with no access to land, and not involved in farming activities, were more likely to be food secure compared to those with access to land and involved in farming activities. Among those with access to land, 28.6% were food secure, while 37.6% were food secure among those with no access to land. Among those involved in farming activities, 25.9% were food secure, lower than the 33% among those not involved in farming activities. These results imply that land-based livelihood strategies, such as farming, are last resort livelihood activities, with those households with limited alternative activities resorting to farming. It should be clear that the result does not indicate that involvement in farming activities leads to food insecurity, which is a fallacy of causation, but that households are facing challenges in accessing food resort to farming activities. Without engaging in farming activities, their food insecurity situation would have been worse. Similarly, the result showing that households who reported to have access to land for farming activities were likely to be those who experienced higher levels of food insecurity suggests that food insecurity is more prevalent among farming communities. Households with access to land for farming activities are often located in rural areas, where livelihood opportunities are very limited. While access to land provides a potential livelihood option, these are often small pieces of land often located in areas with poor soil quality, and the productivity of the farming activities remain low, due to factors such as rudimentary farming methods, poor pest and disease management practices, inadequate extension advisory services, etc.

Employment was positively and significantly associated with food security. While 41.2% of households among those headed by employed household heads were food secure, only 26.9% of those headed by unemployed heads were food secure. Employment remains a crucial pathway in alleviating the scourge of poverty and food insecurity. That food insecurity dominated even among employed household heads suggests that the earnings of the employed are not enough to lift their households out of food insecurity. Further, given that the survey was done during the period of COVID-19 and lockdown restrictions, this also captures the fact that there were also concerns, even among those gainfully employed, about food availability.

The results show that access to infrastructure (such as roads) and basic services (such as water and sanitation) are crucial in improving the food security status of households. Access to all-weather roads reduces transport costs to and from the market, whether to buy (inputs, food, etc.), or to sell output. Those located near accessible roads are like to have better access to market information (prices of inputs, food items, commodities), and they are thus in a better position to achieve better transactions and savings. Access to safe water and sanitation are important development goals and are among the most basic human necessities. A community that has safe drinking water, good sanitation, and good hygiene is less likely to be affected by water-borne diseases such as diarrhoea, dysentery, cholera, typhoid, worms, and trachoma. The analysis showed a significant positive relationship between household food security and access to improved water sources. There is, therefore, a need for government to expand programmes and projects that provide safe water, such as tap water and boreholes in communities, and effort to ensure that each South Africa has access to safe drinking water.

Improved sanitation facilities are facilities that ensure hygienic separation of human excreta from human contact. They include a flush or pour-flush toilet or latrine, piped sewer system, septic tank pit latrine, ventilated improved pit (VIP) latrine, pit latrine with slab, and composting toilet. The results showed that water and sanitation have a significant positive role in household food security. Progress in the WASH sector is assessed through the level of access to WASH services, and the quality and functionality of those services. Equity analyses focus on the degree to which progress in WASH has been pro-poor, and the allocation of budget in relation to need and location. The areas that need improvements in the sector relates to coordination and improved service delivery. Communities indicated that there is also limited consultations by government and development partners during the development of WASH programmes and interventions. This results in limited alignment of partner projects with district priorities. For example, some partners support sanitation and hygiene activities falling under their project impact areas, and not district sanitation and hygiene priority areas. About two-thirds of the challenges reported were in the areas of coordination and delivery of WASH interventions. The results suggest that there is a need for government to promote projects and programmes that provide and encourage access to improved water sources and good hygiene practices, such as the use of latrines and washing hands with soap after using the toilet.

7.7 Discussion

The food security situation in the Free State Province continues to be a cause for concern. The food access indicators have shown that a considerable proportion of households face difficulties in accessing food, with the Household Food Insecurity Access Score (HFIAS), indicating that more than half of the households in Free State Province experienced food insecurity, with only 31.6% found to be food secure. This figure is considerably higher when compared with previous studies, such as Stats SA (2020) who reported in the General Household survey 2020 that 26.2% of the sampled households in the Free State were experiencing food access difficulties.

The HFIAS also showed that 21.6% of the households were severely food insecure, 27.4% of the surveyed households were moderately food insecure, while 19.4% of the households were mildly food insecure. This household food security situation is not strange, bearing in mind that the data was collected during the COVID-19 pandemic period. This implies that the COVID-19 measures may have affected both food availability and access in the study area. The higher food insecurity figures reported in this study could also be possibly because the study largely focussed on open access livelihood zones and these are generally rural communities which are traditionally more food insecure, hence you would expect higher food insecurity levels there. Overall, these results are in line with most of the food security findings which generally indicate that a significant proportion of households' experience food access challenges in South Africa. For example, the 2021 Global Food Security Report indicated that during the 2018-20 period, 45% of the population in South Africa were characterised by moderate food insecurity, and 19% experienced severe food insecurity. The Rapid Assessment Study on the impact of COVID-19 on food and nutrition security found that about 48,9% of individuals in South Africa have moderate to severe food insecurity.

In addition, the results of the food security status as measured by the Household Hunger Scale (HHS) showed that most of the sampled households experienced little to no hunger (73.7%). About 19.1% and 7.2% of the households experienced moderate hunger and severe hunger, respectively. While a significant proportion of households experienced food insecurity (as shown by the HFIAS results), the HHS suggests that the level of food deprivation is not very severe for most of the households in Free State Province. Also, emerging results from the household survey indicate that 75% of the male-headed households experienced little to no hunger compared to 72% of the female-headed households. This situation indicates that there is a need for interventions tailor-made for female- headed households to assist them to reduce hunger experiences. Likewise, the moderate and severe hunger in the household were slightly more experienced by female-headed households compared to male-headed households. However, severe hunger was found to be slightly more experienced by made-headed households than by female- headed households.

The Food Consumption Score (FCS) revealed that most households (37.3%) were consuming adequately (acceptable) diversified diets and about 37.8% of households are at the borderline and could fall into unacceptable diversity of foods if no actions are taken to help them improve their diets. The findings denote the importance for the government to develop interventions that enhance access to diverse foods in most of the districts across areas, as a number of these districts are on borderline diets. The most popular food groups were cereals, condiments, sugars, oils and fats, meats, milk and milk products, other vegetables, roots and tubers, eggs, orange fresh vegetables, other fruits, fish and sea foods, orange-coloured fruits, and pulses and nuts. The least consumed food groups were organ meat, dark green leafy vegetables, orange-coloured fruits, pulses and nuts, fish and seafoods, orange fresh vegetables, and other fruits. This shows that the most consumed food groups were mostly the less healthy ones, providing a different light to what a dietary diversity score showed which gave an impression of a highly diverse and healthy diet.

8 Nutrition

INDIVIDUAL NUTRITION STATUS

8.1 Child Nutrition

South Africa adopted the WHO feeding guidelines, which recommended that infants should be exclusively breastfed until 6 months of age (WHO, 2003; DoH, 2011). It is important to have data on breastfeeding and complementary feeding since this can provide information on the child's growth and immunity and may also explain certain disease conditions. Exclusive breastfeeding for 6 months is particularly important because it provides the best immunity against infectious diseases and, furthermore, decreases the likelihood of the development of gastrointestinal diseases resulting from feeding from bottles which are not properly clean or from infant formula which has not been correctly mixed. Exclusive breastfeeding is encouraged by putting the baby to the breast as soon as possible after giving birth, and by not providing any fluid other than breast milk. The longer this is delayed, the less chance there is of exclusive breastfeeding taking place. It is recommended that semi-solid foods should not be introduced to exclusive breastfeeding infants before 6 months of age since breast milk meets all nutritional requirements; and to infants on other feeding regimes at 4 months of age. Introducing solids too late can also be harmful since infants may not meet all their energy and nutrient requirements.

8.1.1 Infant feeding practices

BREASTFEEDING STATUS

Data was recorded for a total of 210 children under the age of 2 years. Of those aged 0-11 months (n=109), 82.5% were ever breastfed, while 80.5% were breastfeeding at the time the survey was conducted. In children aged 12- 24 months (n=101), 87.9% were ever breastfed, while 39.7% were being breastfed at the time the survey was conducted (Table 45). Male children appeared to have a higher prevalence of being ever breastfed and currently being breastfed than female children, however, the differences were not significant. Reports of between 86.8% and 89.4% were recorded for children that were ever breastfed across all districts, with no significant differences between districts. Thabo Mofutsanyane and Fezile Dabi districts reported a similar proportion of children (89.4% and 88.2%, respectively), while Lejweleputswa reported a slightly lower proportion at 86.8%. Conversely, Fezile Dabi District reported the highest proportion (67.9%) of children who were currently being breastfed, compared to 50.0%- 60.8% of children in the other districts. When disaggregating by district, results should be interpreted with caution as the sample sizes in some districts were small. Data could not be reported for both Xhariep and Mangaung due to the low sample sizes in these districts (n<30).

Table 45: Breastfeeding status among infants aged 0-24 months in Free State

	Ever been breastfed			Currently breastfed1			Exclusively breastfed (0-6 months)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Age(months)									
0-11 months	82.5	[68.0-91.3]	109	80.5	[67.9-89.0]	91			
12-24 months	87.9	[75.9-94.4]	101	39.7	[26.0-55.2]	86			
Gender									
Male	89.6	[82.8-93.9]	98	68.9	[52.2-81.8]	82			17#
Female	80.3	[65.1-89.9]	111	56.4	[41.8-70.0]	94			22#
District									
Xhariep	-	-	19*	-	-	18*	-	-	5#
Lejweleputswa	86.8	[71.5-94.5]	65	50.0	[29.4-70.5]	54	-	-	12#
Thabo Mofutsanyane	89.4	[78.0-95.3]	48	60.8	[40.2-78.2]	39	-	-	4#
Fezile Dabi	88.2	[79.2-93.6]	50	67.9	[46.3-83.8]	43	-	-	13#
Mangaung	-	-	28*	-	-	23*	-	-	5#
Total	**84.8**	**[75.8-90.9]**	**210**	**62.9**	**[51.2-73.2]**	**177**	**28.1**	**[11.8-53.4]**	**39**

[1]among those ever breastfed * cell sample sizes too small to generate reasonable estimate # n<30

8.1.1.1 Time lapsed until the introduction of breastfeeding

In most infants aged 0-24months, (n=279), breastfeeding was introduced immediately (79.9%), within the first hour (12.7%) or within 24 hours (3.2%) (Table 46). Only in 2.4% of cases was breastfeeding introduced more than 24 hours after birth. There were no significant differences reported between children aged 0-11 months and 12-24 months. Neither were there any significant differences reported between male and female children.

At a district level, ZF Mgcawu and John Taolo Gaetsewe, reported the lowest proportion of children to be immediately breastfed (between 75%-80%), while Namakwa and Pixley ka Seme districts reported close to 82% and Frances Baard District reported nearly 86% (Table 7.2). These proportions were not significantly different. Due to the small sample size at district level, results should be interpreted with caution.

Table 46: Time lapsed until the introduction of breastfeeding among infants aged 0-24 months in Free State

	Immediately		Less than one hour		Less than 24 hours		More than 24 hours		Don't know		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age											
0-11 months	67.3	[53.0-79.1]	18.8	[9.1-34.9]	9.1	[4.8-16.7]	4.4	[1.3-14.1]	0.3	[0.0-2.0]	91
12-24 months	79.6	[67.9-87.9]	12.6	[6.2-23.8]	6	[2.4-14.1]	0.9	[0.1-6.3]	0.9	[0.1-6.7]	86
Gender											
Male	76.9	[61.7-87.3]	14.1	[5.4-32.2]	7.8	[3.8-15.2]	0.9	[0.1-5.1]	0.3	[0.0-2.4]	82
Female	69.5	[56.5-80.0]	16.8	[9.0-29.3]	7.9	[3.8-15.6]	4.9	[1.4-16.0]	0.8	[0.1-5.8]	94
District											
Xhariep	-	-	-	-	-	-	-	-	-	-	18#
Lejwele-putswa	52.5	[35.7-68.8]	36.6	[22.0-54.2]	10.9	[5.1-21.9]	0		0		54
Thabo Mo-futsanyane	84.3	[73.2-91.3]	11.5	[5.2-23.5]	2.5	[0.6-10.0]	1.7	[0.2-12.2]	0		39
Fezile Dabi	75.3	[58.2-87.0]	5.1	[1.0-22.1]	11.2	[5.1-22.9]	5.9	[0.8-32.7]	2.4	[0.5-11.3]	43
Mangaung	-	-	-	-	-	-	-	-	-	-	23#
Total	**72.7**	**[63.2-80.5]**	**16.1**	**[9.6-25.8]**	**7.8**	**[4.7-12.5]**	**2.9**	**[0.9-8.5]**	**0.6**	**[0.1-2.6]**	**177**

* cell sample sizes too small to generate reasonable estimate # n<30

8.1.1.2 Age at which breastfeeding was stopped

Among children aged 0-24 months (n=77), breastfeeding was often stopped between the ages of 0-3 months (33.9%) and 5-6 months (24.7%). More than 68% of mothers stopped breastfeeding before the age of 6 months, while 33.9% stopped breastfeeding before 3 months, 9.5% stopped between 3-4 months, and 24.7% stopped between 5-6 months (Figure 59). Only 10.7% of mothers continued to breastfeed for longer than 12 months, with only 1.0% continuing up to 24 months. Due to limitations in of small sample sizes, `no comparisons could be made at both an age group and district level.

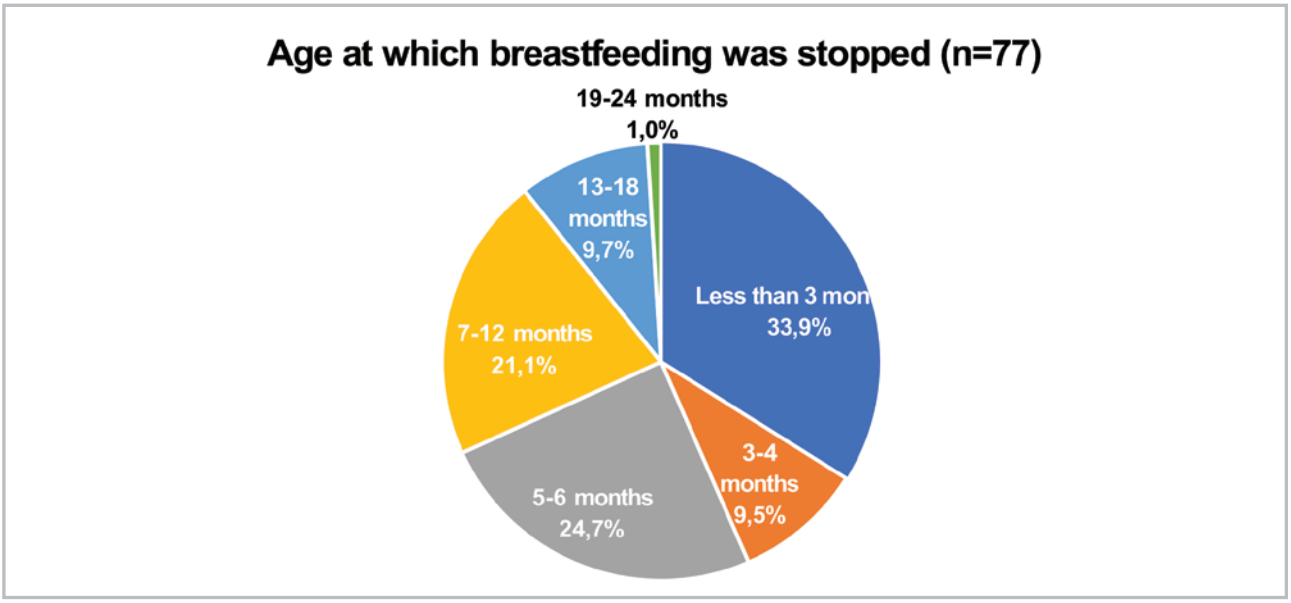


Figure 60: *Age at which breastfeeding was stopped among infants aged 0-24 months in Free State*

8.1.1.3 First drink other than breastmilk

Infant formula (48.1%) and plain water (20.1%) were reported to be the most common first drink other than breastmilk that was introduced to infants under 2 years of age (Figure 60). There were, however, no significant differences found between age groups, gender, and districts (Table 47).

Mothers in all districts, except Lejweleputswa, reported that infant formula, followed by water, was the most common first drink introduced to children aged 0-24 months. Mothers in Lejweleputswa District reported that gripe water (14.4%) was introduced more often than plain water (11.9%) to children in this district. Other drinks such as, juice, tea, and medicine were reported as first drinks by less than 15.0% of mothers across all districts. It is important to note, though, that district level comparisons must be interpreted with caution due to the small sample sizes.

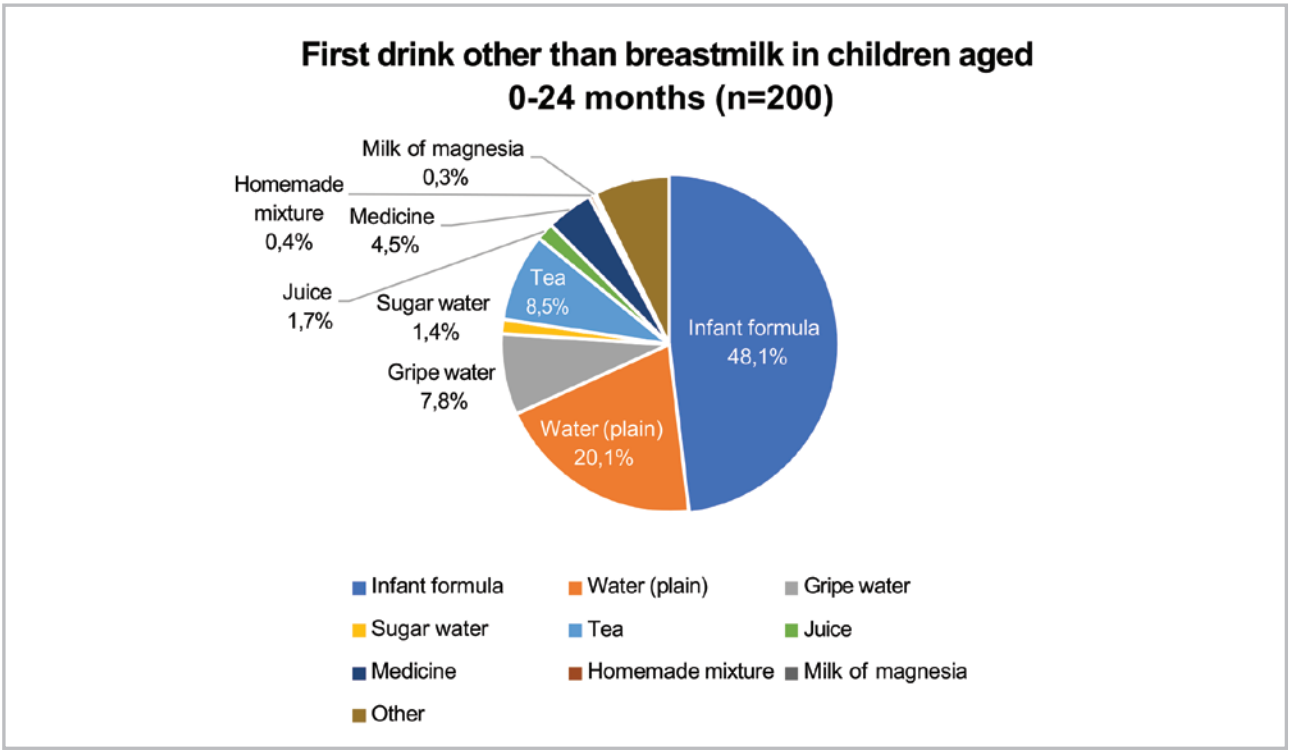


Figure 61: *First drink other than breast milk among children aged 0-24 months in Free State*

Table 47: The first drink other than breast milk among children aged 0-24 months by district in Free State

	Infant formula		Water (plain)		Gripe water		Sugar water		Tea		Juice		Medicine		Home-made mixture		Other		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age																			
0-11 months	47	[32.2-62.4]	18.8	[8.2-37.7]	10.5	[4.7-21.9]	0.8	[0.1-5.7]	6.9	[1.2-31.0]	0		4.5	[2.0-9.6]	0		11.2	[3.0-33.9]	97
12-24 months	49.4	[34.2-64.7]	21.8	[11.5-37.3]	4.4	[1.6-11.3]	2.1	[0.7-6.3]	10.6	[4.2-24.3]	3.8	[0.9-14.3]	4.5	[1.1-16.2]	0.9	[0.1-6.5]	2.2	[0.4-10.9]	103
Gender																			
Male	45.1	[29.4-61.8]	26.2	[12.3-47.2]	6.2	[2.6-14.0]	1.3	[0.4-4.9]	3	[0.9-10.0]	0		5.9	[2.1-15.8]	0		11.9	[2.7-39.8]	94
Female	50.1	[37.7-62.5]	14.9	[7.7-26.8]	9.4	[3.6-22.0]	1.4	[0.3-5.9]	13.6	[5.0-32.0]	3.2	[0.8-12.2]	3.2	[1.2-8.5]	0.8	[0.1-5.6]	3.1	[1.0-9.7]	105
District – NW																			
Xhariep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19#
Lejwele-putswa	62.2	[41.4-79.3]	11.9	[3.8-31.8]	14.4	[5.6-32.6]	1.5	[0.2-10.1]	5.5	[0.8-28.5]	0		2.7	[0.9-8.1]	0		1.8	[0.4-7.4]	59
Thabo Mo-futsanyane	50.5	[32.5-68.5]	25.9	[10.3-51.6]	3.2	[0.8-12.2]	1.4	[0.2-8.2]	6.6	[2.0-20.1]	4.6	[0.6-27.2]	1.1	[0.1-7.5]	1.9	[0.3-13.0]	4	[0.6-21.8]	48
Fezile Dabi	46.9	[25.5-69.5]	27.8	[7.2-65.7]	8.7	[2.2-28.8]	2.8	[0.7-10.5]	4	[0.8-17.1]	0		7.4	[2.7-18.6]	0		1.8	[0.3-11.7]	46
Mangaung	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28#
Total	**34.7**	**[21.4-50.9]**	**23.1**	**[12.8-37.9]**	**12.1**	**[6.5-21.3]**	**10.1**	**[4.7-20.4]**	**8.8**	**[1.8-34.3]**	**1.0**	**[0.3-3.8]**	**3.2**	**[0.5-19.3]**	**0.2**	**[0.0-1.8]**	**6.8**	**[3.6-12.5]**	**178**

* cell sample sizes too small to generate reasonable estimate # n<30

8.1.1.4 Age at which the first drink other than breast milk was introduced

Overall, the first drink other than breast milk was mainly introduced at 0-11 months (47%), followed by 3 months (49.4%). The same pattern was followed for children in both age groups, with 41.1% and 14.7% of children aged 0-11months and 33.2% and 18.5% of children aged 12-24 months, introduced to other drinks 0-1months and 3 months, respectively, with no significant differences shown between age groups (Table 48). We can assume that the introduction of other drinks before the age of 1 month is most likely the introduction of infant formula. Of the remaining children, 10% of children were introduced to other drinks at 2 months and nearly 25% introduced after 6 months of age.

When doing comparisons by gender, 41.2% of males were introduced to other drinks before the age of one month, with 21.1% at 3 months. However, in the remaining males, just over 5% were only introduced to other drinks after 6 months. Slightly more females (40.9%) were introduced to other drinks before the age of 1 month, but only 15.9% were introduced to other drinks after 6 months of age, with about 16.6% being introduced to other drinks around 2 months of age. This seems to indicate that more male children are possibly exclusively breastfed compared to female children, however, the difference was not significant between genders.

Similar patterns were displayed across districts, where the majority of children were introduced to other drinks before the age of 1 month (27.5%-48.5%). This was followed by 3 months in Lejweleputswa (21.1%), 3 and 6 months in Thabo Mofutsanyane District, and 4 months in Fezile Dabi District (17.9%), with no significant differences shown at a district level.

Table 48: Age at which solid food other than breastmilk was introduced among infants aged 0-24 months in Free State

	Name of first semi-solid or solid food (with a spoon or fingers)																
	Infant Cereal / Porridge (commercial)		Cereal / Porridge (homemade)		Cereal / Porridge (clinic)		Pureed / mashed vegetables / fruit		Bottled / canned baby foods		Traditional baby food		Custard		Other (specify)		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)																	
0-11 months	46.6	[30.2-63.8]	15.0	[7.5-27.6]	0.9	[0.1-6.7]	16.1	[8.5-28.2]	0.6	[0.1-4.2]	1.0	[0.2-4.4]	19.8	[8.1-40.8]	84	[7.4-30.8]	75
12-24 months	41.3	[26.7-57.6]	29.6	[18.2-44.3]	2.0	[0.4-8.6]	25.2	[14.3-40.4]	1.2	[0.4-4.2]	0.3	[0.0-2.1]	0.3	[0.0-2.4]	104	[0.0-1.0]	94
Gender																	
Male	41.2	[24.5-60.2]	20.6	[10.3-36.9]	2.0	[0.5-8.3]	15.3	[7.2-29.5]	1.2	[0.3-4.2]	1.4	[0.4-5.1]	18.3	[6.3-42.8]	86	[2.4-19.5]	86
Female	46.9	[31.4-63.1]	22.7	[13.0-36.7]	0.9	[0.2-3.8]	24.8	[14.4-39.2]	0.6	[0.1-4.2]	0.0		4.1	[1.2-13.1]	101	[3.2-23.6]	82
District																	
Xhariep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16#		62
Lejwele-putswa	41.9	[20.7-66.5]	13.6	[4.3-35.8]	3.3	[0.7-13.6]	27.2	[12.3-49.7]	3.2	[1.2-8.2]	0.5	[0.1-3.1]	10.4	[2.6-33.5]	52	[3.5-43.9]	37
Thabo Mofutsan-yane	27.4	[15.6-43.4]	43.5	[27.1-61.4]	0.0		25.6	[13.9-42.1]	0.0		0.0		3.6	[0.7-16.2]	47	[3.1-19.0]	70
Fezile Dabi	41.1	[19.0-67.5]	16.0	[6.3-35.1]	0.0		30.5	[15.7-50.9]	0.0		0.0		12.4	[4.0-32.3]	45		
Mangaung	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28#		
Total	**44.2**	**[31.8-57.3]**	**21.7**	**[14.2-31.8]**	**1.4**	**[0.4-4.7]**	**20.2**	**[13.1-29.9]**	**0.9**	**[0.3-2.5]**	**0.7**	**[0.2-2.4]**	**10.9**	**[4.4-24.5]**	**188**	**[3.6-17.0]**	**169**

* cell sample sizes too small to generate reasonable estimate # n<30

8.1.1.5 Milk feeds

The mean age at which milk feeds were introduced to children was higher in those aged 12-24 months (7.7 months) and females (6.5 months) as compared to those aged 0-11 months (4.3 months) and males (4.2 months); however, these differences were not significant (Table 49). At a district level, comparisons were not possible due to the small sample sizes.

Table 49: Mean age at introduction of milk feeds among infants 0-24 months old in Free State

	Mean	95% CI	n
Age (months)			
0-11 months	4.3	[1.8-6.8]	64
12-24 months	7.7	[5.9-9.4]	57
Gender			
Male	4.2	[3.2-5.2]	51
Female	6.5	[4.4-8.7]	69
Xhariep	-	-	16#
Lejweleputswa	5.1	[2.4-7.9]	43
Thabo Mofutsanyane	-	-	25#
Fezile Dabi	-	-	22#
Mangaung	-	-	15#
Total	**5.7**	**[4.1-7.3]**	**121**

cell sample sizes too small to generate a reasonable estimate # n<30

Except for breast milk, most infants (69.2%) were receiving infant formula, followed by full strength cow milk (32.1%), diluted cow milk (2.6%), and 3.0% receiving other milk (Table 50). No significant differences were observed between age groups; however, there seemed to be a significant difference between genders, where a significantly higher prevalence of female children (41.6%) were receiving cow milk compared to males (10.3%). These results do have to be interpreted with caution, though, due to the small sample sizes. At a district level, comparisons were not possible due to the small sample size.

Table 50: The type of milk other than breast milk that the infant receives (among infants aged 0-24 months who are receiving milk feeds) in Free State

	Cow's milk (full strength)		Cow's milk (diluted)		Goats milk		KLIM / Nespray		Infant formula		Other		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)													
0-11 months	20.9	[5.8-53.0]	1.4	[0.2-9.3]	0.0	-	1.9	[0.4-9.4]	76.7	[47.7-92.2]	3.4	[1.0-11.1]	64
12-24 months	47.4	[28.5-67.1]	4.2	[0.7-21.0]	0.0	-	2.9	[0.5-15.9]	58.9	[41.6-74.3]	2.4	[0.5-10.8]	57
Gender													
Male	10.3	[4.6-21.3]	0.0		0.0	-	3.4	[0.4-21.1]	82.9	[67.9-91.7]	3.8	[0.7-17.2]	51
Female	41.6	[23.2-62.6]	3.9	[0.6-20.5]	0.0	-	1.9	[0.4-8.0]	63.8	[43.4-80.2]	2.6	[0.8-8.5]	69
District													
Xhariep	-	-	-	-	-	-	-	-	-	-	-	-	16#
Lejweleputswa	10.0	[4.2-22.2]	6.4	[0.9-33.8]	0.0	-	0.0		80.8	[60.9-91.9]	2.8	[0.6-12.2]	43
Thabo Mofutsanyane	-	-	-	-	-	-	-	-	-	-	-	-	25#
Fezile Dabi	-	-	-	-	-	-	-	-	-	-	-	-	22#
Mangaung	-	-	-	-	-	-	-	-	-	-	-	-	15#
Total	**32.1**	**[18.7-49.3]**	**2.6**	**[0.4-14.1]**	**0.0**	**-**	**2.3**	**[0.7-7.7]**	**69.2**	**[53.5-81.4]**	**3.0**	**[1.1-7.6]**	**121**

cell sample sizes too small to generate a reasonable estimate # n<30

8.1.1.6 Solid foods

The mean age at which the first semi-solid or solid foods were introduced was 5.3 months. There were no significant differences, between age groups, gender, and districts. (Table 51).

Table 51: Age of introduction of first semi-solid or solid food and the types of foods among infants 0-24 months in Free State

	Mean	95% CI	Sample
Age (months)			
0-11 months	4.5	[3.8-5.3]	84
12-24 months	6.2	[5.2-7.2]	104
Gender			
Male	5.1	[4.5-5.7]	86
Female	5.5	[4.5-6.6]	101
District			
Xhariep	-	-	16#
Lejweleputswa	5.4	[3.7-7.1]	52
Thabo Mofutsanyane	5.2	[4.4-5.9]	47
Fezile Dabi	5.1	[4.1-6.1]	45
Mangaung	-	-	28#
Total	**5.3**	**[4.6-6.0]**	**188**

cell sample sizes too small to generate a reasonable estimate # n<30

Table 52 shows that commercial infant cereal was the first semi-solid food given to most children aged 0-24 months (44.2%), followed by homemade infant cereal/porridge (21.7%) and pureed/mashed fruit/ vegetables (20.2%). Less than 3.0% of infants had cereal/ porridge supplied by the clinic and bottled/ canned baby foods as their first semi- solid foods, while 10.9% and 0.7% of mothers reported other foods and traditional baby foods as their infant's first food, respectively. There were no significant differences when disaggregating by gender nor district. The only significant difference observed occurred between age groups, where children aged 0-11 months had a significantly higher prevalence (19.8%) of being introduced to other foods than those aged 12-24 months (0.3%).

Table 52: Types of first semi-solid or solid food among infants 0-24 months in Free State

	Name of first semi-solid or solid food (with a spoon or fingers)														
	Infant Cereal / Porridge (commercial)		Cereal / Porridge		Cereal / Porridge (clinic)		Pureed / mashed vegetables / fruit		Bottled / canned baby foods		Traditional baby food		Other (specify)		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)															
0-11 months	46.6	[30.2-63.8]	15.0	[7.5-27.6]	0.9	[0.1-6.7]	16.1	[8.5-28.2]	0.6	[0.1-4.2]	1.0	[0.2-4.4]	19.8	[8.1-40.8]	84
12-24 months	41.3	[26.7-57.6]	29.6	[18.2-44.3]	2.0	[0.4-8.6]	25.2	[14.3-40.4]	1.2	[0.4-4.2]	0.3	[0.0-2.1]	0.3	[0.0-2.4]	104
Gender															
Male	46.6	[30.2-63.8]	15.0	[7.5-27.6]	0.9	[0.1-6.7]	16.1	[8.5-28.2]	0.6	[0.1-4.2]	1.0	[0.2-4.4]	19.8	[8.1-40.8]	84
Female	41.3	[26.7-57.6]	29.6	[18.2-44.3]	2.0	[0.4-8.6]	25.2	[14.3-40.4]	1.2	[0.4-4.2]	0.3	[0.0-2.1]	0.3	[0.0-2.4]	104
District															
Xhariep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16#
Lejwele-putswa	41.9	[20.7-66.5]	13.6	[4.3-35.8]	3.3	[0.7-13.6]	27.2	[12.3-49.7]	3.2	[1.2-8.2]	0.5	[0.1-3.1]	10.4	[2.6-33.5]	52
Thabo Mofutsan-yane	27.4	[15.6-43.4]	43.5	[27.1-61.4]	0.0		25.6	[13.9-42.1]	0.0		0.0		3.6	[0.7-16.2]	47
Fezile Dabi	41.1	[19.0-67.5]	16.0	[6.3-35.1]	0.0		30.5	[15.7-50.9]	0.0		0.0		12.4	[4.0-32.3]	45
Mangaung	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28#
Total	**44.2**	**[31.8-57.3]**	**21.7**	**[14.2-31.8]**	**1.4**	**[0.4-4.7]**	**20.2**	**[13.1-29.9]**	**0.9**	**[0.3-2.5]**	**0.7**	**[0.2-2.4]**	**10.9**	**[4.4-24.5]**	**188**

cell sample sizes too small to generate a reasonable estimate # n<30

8.1.2 Anthropometry (0-59 months)

This section presents the key nutrition findings for children aged 0-59 months. It presents anthropometric measures such as stunting, wasting and underweight, which are important indicators in the assessment of child health and nutrition status. It highlights both forms of moderate and severe acute malnutrition among children under the age of five. The prevalence of malnutrition remains a public health problem which results in substantial mortality and disease burden worldwide. The Lancet series (2013) reported that malnutrition accounts for 45% of all the deaths of children under the age of five. This estimate translated to 3.1 million deaths globally in 2011. It is further reported that it includes intrauterine fetal growth restriction, stunting, wasting, and micro-nutrient deficiency, especially of vitamin A and Zinc. This occurs along with poor infant feeding practices, which are indicated by suboptimum breastfeeding.

Anthropometric data was recorded for 371 children under the age of 5 years; of these, there were a slightly higher number of girls (53.9%) than boys (46.1%) (Table 53).

Table 53: Distribution of age and sex of the sample in Free State

	Boys		Girls		Total	
Age (months)	**n**	**%**	**n**	**%**	**n**	**%**
<6	22	44.9	27	55.1	49	13.2
6-17	45	44.6	56	55.4	101	27.2
18-29	35	44.9	43	55.1	78	21
30-41	36	50.7	35	49.3	71	19.1
42-53	28	52.8	25	47.2	53	14.3
54-59	5	26.3	14	73.7	19	5.1
Total	**171**	**46.1**	**200**	**53.9**	**371**	**100**

8.1.2.1 Stunting

The overall prevalence of stunting for children under the age of 5 years (n=359) was 30.5%, of which 12.0% was severe, and 18.5% was moderate stunting (Table 54 and Figure 61). There were no significant differences in overall stunting between age groups, gender, and districts.

When disaggregating by severe and moderate stunting, children aged 18-29 months had the highest prevalence of moderate stunting (31.9%), while those under 6 months of age had the highest prevalence of severe stunting (17.9%). These were, however, not significant when compared to other age groups (Table 54 and Figure 62).

Comparisons by gender in all children in Free State Province under 5 years of age indicated that males had a slightly higher prevalence of stunting (32.1%) compared to females (29.0%); however, this was not significant (Table 54 and Figure 63). Generally, it seems as if moderate and severe stunting were evenly distributed in males (17.5% and 14.6%, respectively), however, far more males were moderately stunted (19.4%) compared to those who were severely stunted (9.6%).

District comparisons show that the overall prevalence of stunting was highest in the Xhariep District (43.2%), with more moderate (35.4%) than severe stunting (7.9%). The prevalence of overall stunting was lowest in Fezile Dabi (24.2%) and Thabo Mofutsanyane (27.3%) districts. However, there was no significant differences at a district level across all categories of stunting. Generally, more children were moderately stunted than severely stunted in all districts. The exception here was in Fezile Dabi District, where a similar prevalence of moderate (11.8%) and severe stunting (12.4%) was observed.

Table 54: The prevalence of stunting in children under 5 years in Free State by age, sex, and district in Free State

	No stunting HAZ>=-2		All stunting HAZ<-2		Moderate stunting HAZ<-2 and >=-3		Severe stunting HAZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	69.8	[47.7-85.4]	30.2	[14.6-52.3]	12.3	[4.2-31.0]	17.9	[6.4-40.9]	45
6-17	72.4	[59.4-82.5]	27.6	[17.5-40.6]	17.2	[9.3-29.7]	10.3	[5.6-18.3]	98
18-29	53.9	[37.5-69.6]	46.1	[30.4-62.5]	31.9	[18.5-49.2]	14.1	[7.4-25.4]	75
30-41	72.9	[58.6-83.7]	27.1	[16.3-41.4]	18.9	[9.3-34.5]	8.1	[3.2-19.0]	70
42-53	74.9	[54.7-88.0]	25.1	[12.0-45.3]	10.1	[3.5-26.1]	15.0	[5.2-36.0]	53
54-59	-	-	-	-	-	-	-	-	18#
Gender									
Female	71.0	[62.8-77.9]	29.0	[22.1-37.2]	19.4	[13.6-27.0]	9.6	[5.5-16.3]	192
Male	67.9	[55.5-78.2]	32.1	[21.8-44.5]	17.5	[10.5-27.7]	14.6	[8.6-23.7]	167
District									
Xhariep	56.8	[39.5-72.5]	43.2	[27.5-60.5]	35.4	[17.3-58.9]	7.9	[1.5-32.3]	32
Lejweleputswa	63.0	[48.3-75.6]	37.0	[24.4-51.7]	22.8	[14.1-34.7]	14.2	[7.7-24.9]	110
Thabo Mofutsanyane	72.7	[61.7-81.5]	27.3	[18.5-38.3]	15.4	[9.0-25.2]	11.9	[5.5-23.7]	92
Fezile Dabi	75.8	[65.0-84.1]	24.2	[15.9-35.0]	11.8	[6.4-20.6]	12.4	[5.3-26.6]	83
Mangaung	69.8	[50.6-84.0]	30.2	[16.0-49.4]	21.1	[10.5-37.9]	9.0	[3.2-22.7]	42
Total	**69.5**	**[62.6-75.7]**	**30.5**	**[24.3-37.4]**	**18.5**	**[14.0-24.0]**	**12.0**	**[8.2-17.2]**	**359**

* cell sample sizes too small to generate a reasonable estimate # n<30

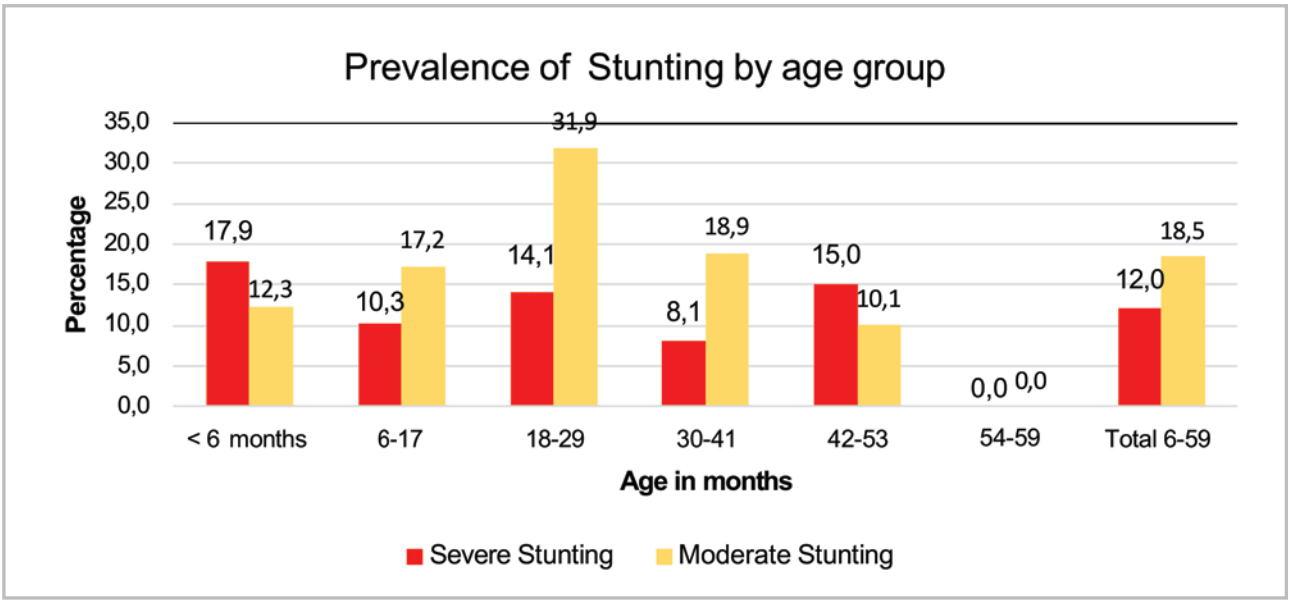


Figure 62: *The prevalence of Stunting in children under 5 years by age group in Free State*

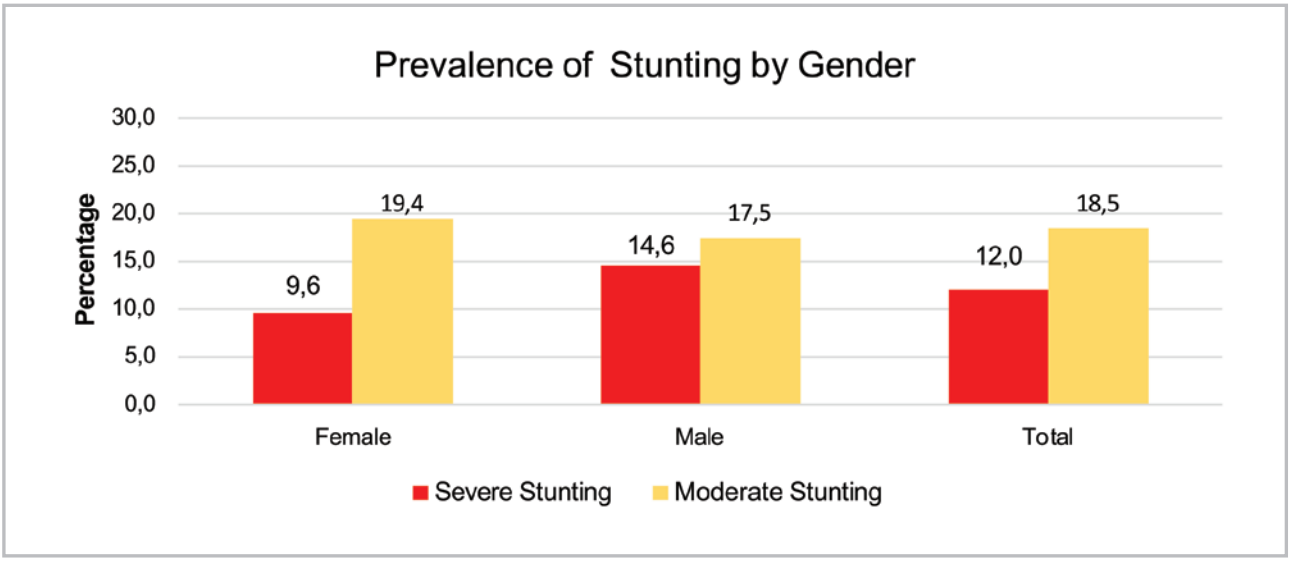


Figure 63: *The prevalence of Stunting in children under 5 years by gender in Free State*

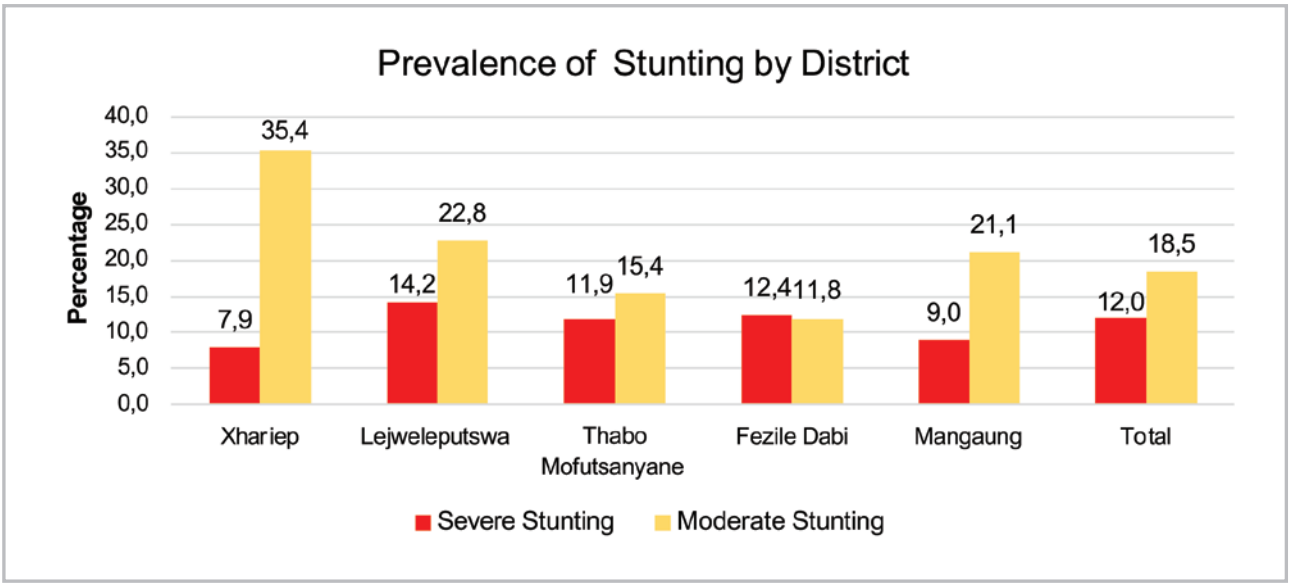


Figure 64: *The prevalence of Stunting in children under 5 years by district in Free State*

8.1.2.2 Wasting

The overall prevalence of wasting for children under the age of 5 years (n=354) was 4.7%, of which 1.9% was severe and 2.8% was moderate wasting (Table 55 and Figure 65). For overall wasting, across all age groups, the prevalence ranged from 0.0% in children aged <6 months to 9.9% in children aged 6-17 months. The differences between these age groups were, however, not significant. While the prevalence of overall wasting in females (6.5%) was more than double that in males (2.7%), these differences were also not significant. Overall wasting ranged from 0.5% in Xhariep to 7.7% in Lejweleputswa districts, however, differences between districts were also not significant (Table 55 and Figure 66).

The prevalence of moderate wasting was highest in children aged 6-17 months (6.7%), and lowest in the age groups <6 months (0.0%) and 30-41 months (0.1%). This difference was significant. While females had a higher prevalence of moderate wasting (3.6%) than males and Lejweleputswa District had the highest prevalence of moderate wasting (5.3%); compared to other districts (range 0.5%-2.4%), there were no significant differences in moderate wasting between genders and across districts.

Comparisons for severe wasting across gender, age group, and districts did not reveal any additional significant differences. Generally, more children were moderately wasted than severely wasted in all districts, except in Fezile Dabi and Mangaung districts where the prevalence of severe wasting was slightly higher than that of moderate wasting.

Table 55: The prevalence of wasting in children under 5 years in Free State by age, sex, and district

	No wasting WHZ>=-2		All wasting WHZ<-2		Moderate wasting WHZ<-2 and >=-3		Severe wasting WHZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	100.0		0.0		0.0		0.0		45
6-17	90.1	[80.7-95.2]	9.9	[4.8-19.3]	6.7	[2.6-16.2]	3.2	[0.9-10.2]	97
18-29	97.1	[82.3-99.6]	2.9	[0.4-17.7]	2.9	[0.4-17.7]	0.0		74
30-41	97.0	[88.1-99.3]	3.0	[0.7-11.9]	0.1	[0.0-0.5]	3.0	[0.7-12.0]	67
42-53	95.6	[83.1-99.0]	4.4	[1.0-16.9]	2.0	[0.3-13.5]	2.4	[0.3-16.0]	53
54-59	-	-	-	-	-	-	-	-	18#
Gender									
Female	93.5	[88.0-96.6]	6.5	[3.4-12.0]	3.6	[1.4-9.2]	2.8	[1.1-7.1]	190
Male	97.3	[92.5-99.0]	2.7	[1.0-7.5]	1.8	[0.5-7.1]	0.9	[0.2-3.5]	164
District									
Xhariep	99.5	[95.8-99.9]	0.5	[0.1-4.2]	0.5	[0.1-4.2]	0.0		31
Lejweleputswa	92.3	[84.4-96.4]	7.7	[3.6-15.6]	5.3	[1.8-14.2]	2.4	[0.6-9.0]	110
Thabo Mofutsanyane	98.3	[88.3-99.8]	1.7	[0.2-11.7]	1.7	[0.2-11.7]	0.0		87
Fezile Dabi	96.6	[87.6-99.2]	3.4	[0.8-12.4]	1.3	[0.2-9.2]	2.1	[0.3-12.5]	84
Mangaung	93.8	[84.5-97.7]	6.2	[2.3-15.5]	2.4	[0.4-15.2]	3.7	[1.2-11.1]	42
Total	**95.3**	**[92.0-97.3]**	**4.7**	**[2.7-8.0]**	**2.8**	**[1.2-6.1]**	**1.9**	**[0.8-4.3]**	**354**

* cell sample sizes too small to generate reasonable estimate # n<30

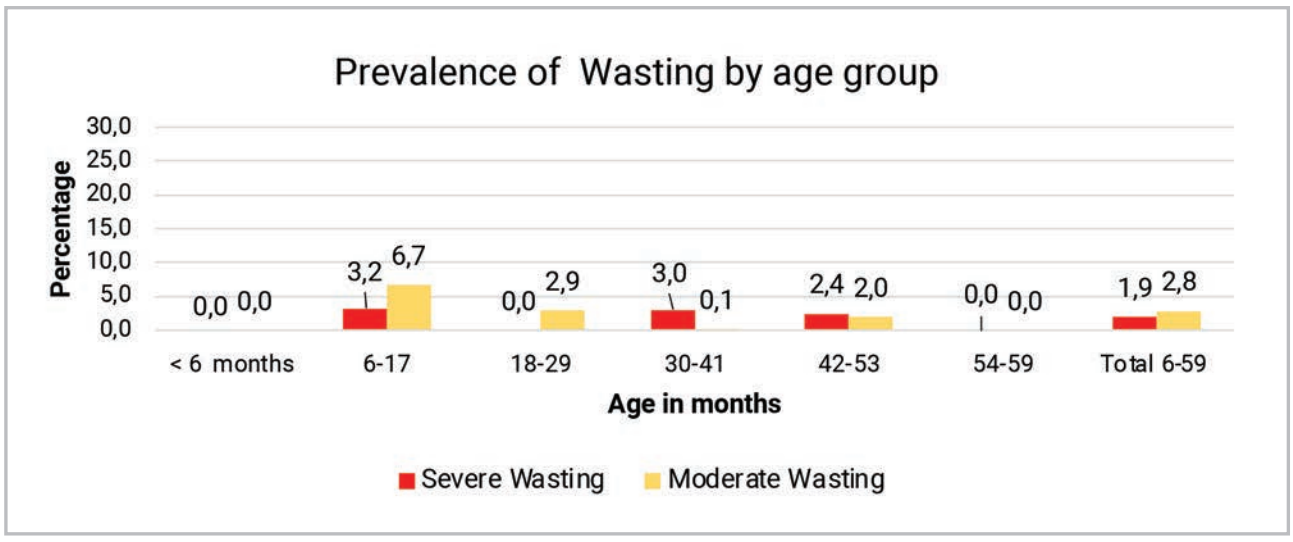


Figure 65: The prevalence of Wasting in children under 5 years by age group in Free State

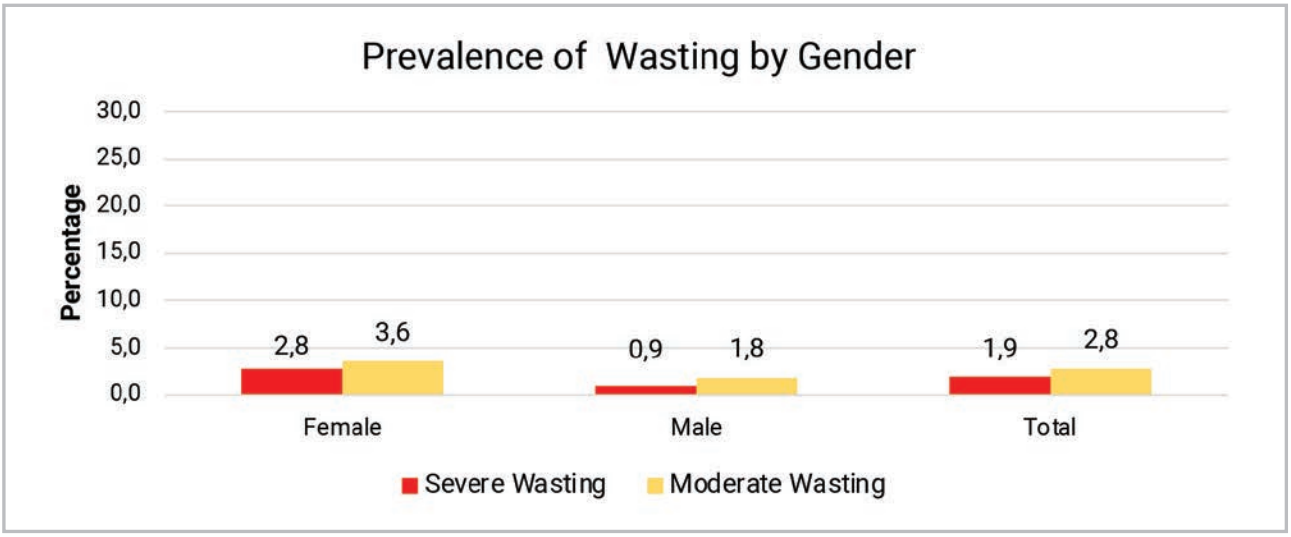


Figure 66: *The prevalence of Wasting in children under 5 years by gender in Free State*

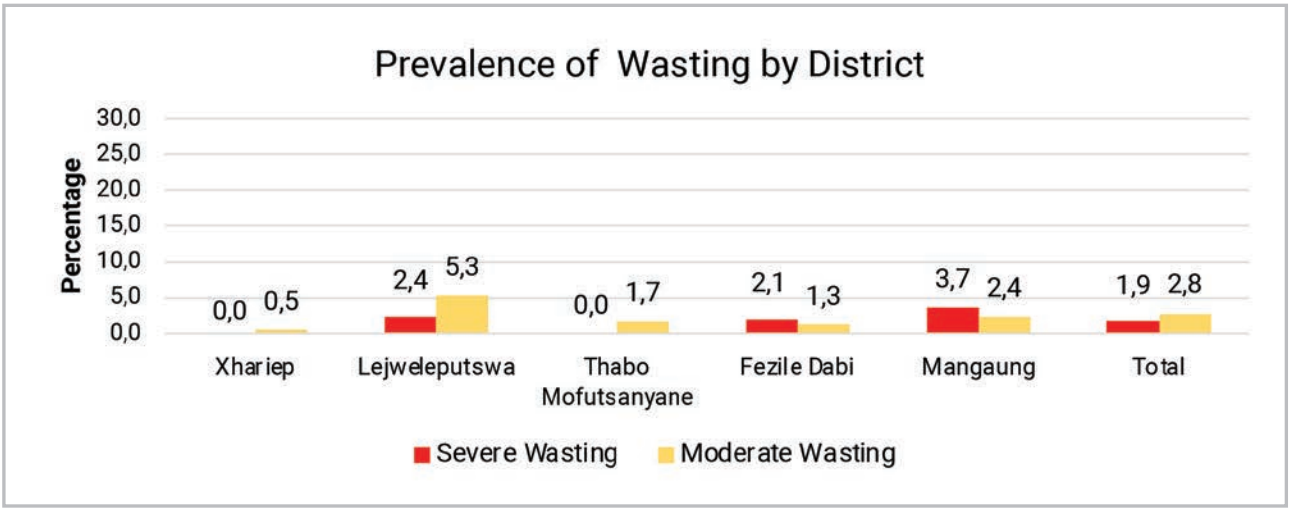


Figure 67: *The prevalence of Wasting in children under 5 years by district in Free State*

8.1.2.3 Underweight

The overall prevalence of underweight for children under the age of 5 years (n=366) was 10.8%, of which 4.1% was severe and 6.7% was moderate underweight (Table 56 and Figure 67). The prevalence of overall and moderate underweight was highest in children aged 42-53 months at 14.5% and 11.4%, respectively. Severe underweight was highest in the 18-29 months age group (5.4%). There were no significant differences in moderate and severe underweight across age groups, nor significant differences in overall underweight.

Comparisons between gender groups showed that males (11.0%) and females (10.6%) had a similar prevalence of being underweight (Table 56 and Figure 68). While these differences were not significant, it does appear that males had a higher prevalence of moderate underweight (8.2%) as compared to females (5.3%), while females had a higher prevalence of severe underweight (5.3%) as compared to males (2.8%). It appears as if a higher proportion of males were moderately underweight, while females seemed to be equally distributed between moderate and severe underweight.

Lejweleputswa District reported the highest overall prevalence of underweight (15.0%), while Xhariep District reported the lowest overall prevalence (2.7%) (Table 56 and Figure 69). However, these differences were not significant. No significant differences were observed at a district level for both moderate and severe underweight.

Table 56: The prevalence of Underweight in children under 5 years by age, sex, and district in Free State

	Not underweight WAZ>=-2		All Underweight WAZ<-2		Moderate underweight WAZ<-2 and >=-3		Severe underweight WAZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	91.5	[65.2-98.4]	8.5	[1.6-34.8]	7.1	[1.0-37.1]	1.4	[0.2-9.4]	47
6-17	87.4	[77.1-93.4]	12.6	[6.6-22.9]	7.6	[3.0-18.1]	5.0	[2.0-12.0]	100
18-29	89.3	[80.3-94.5]	10.7	[5.5-19.7]	5.3	[1.8-14.4]	5.4	[1.8-15.2]	77
30-41	90.8	[81.2-95.7]	9.2	[4.3-18.8]	4.3	[1.4-12.0]	5.0	[1.6-14.7]	70
42-53	85.5	[69.5-93.8]	14.5	[6.2-30.5]	11.4	[4.4-26.5]	3.2	[0.7-12.9]	53
54-59	-	-	-	-	-	-	-	-	19#
Gender									
Female	89.4	[83.1-93.6]	10.6	[6.4-16.9]	5.3	[2.3-11.7]	5.3	[2.5-10.6]	197
Male	89.0	[81.7-93.6]	11.0	[6.4-18.3]	8.2	[4.2-15.5]	2.8	[1.1-7.0]	169
District									
Xhariep	97.3	[81.4-99.7]	2.7	[0.3-18.6]	0.0		2.7	[0.3-18.6]	32
Lejwele-putswa	85.0	[74.0-91.9]	15.0	[8.1-26.0]	11.7	[5.3-23.8]	3.3	[0.8-12.4]	114
Thabo Mofutsan-yane	91.5	[85.9-95.0]	8.5	[5.0-14.1]	6.2	[3.2-11.6]	2.4	[0.6-8.8]	92
Fezile Dabi	89.6	[80.8-94.6]	10.4	[5.4-19.2]	1.3	[0.2-8.1]	9.1	[4.3-18.4]	86
Mangaung	90.9	[79.7-96.2]	9.1	[3.8-20.3]	6.5	[2.1-18.4]	2.6	[0.9-7.2]	42
Total	**89.2**	**[85.0-92.4]**	**10.8**	**[7.6-15.0]**	**6.7**	**[4.0-10.9]**	**4.1**	**[2.3-7.1]**	**366**

* cell sample sizes too small to generate reasonable estimate # n<30

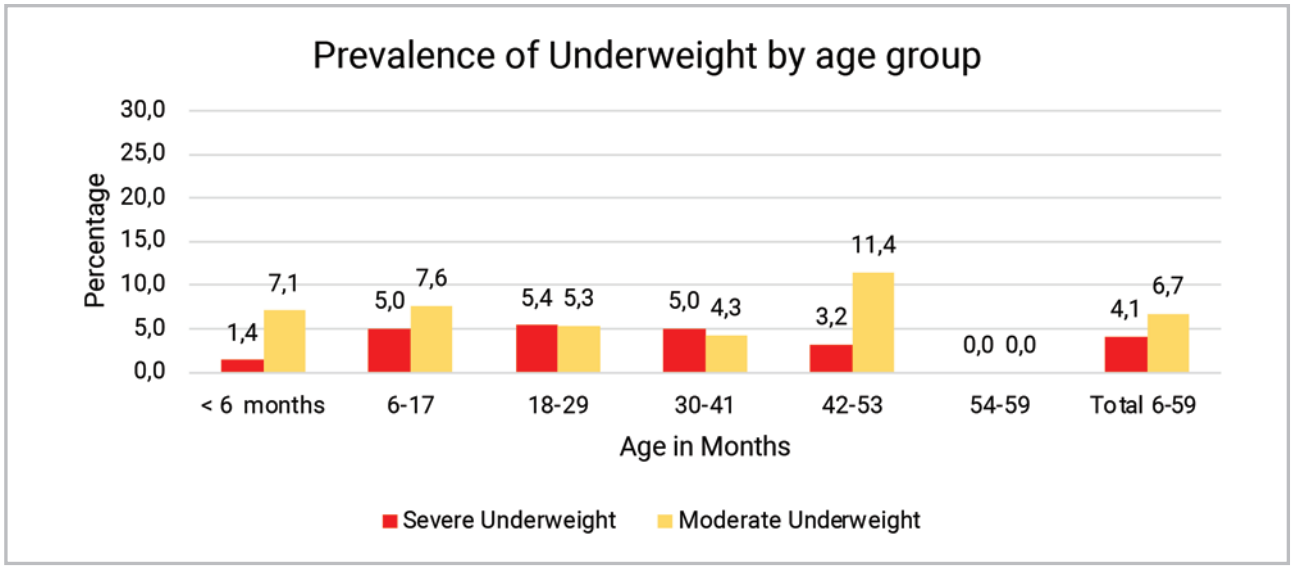


Figure 68: *The prevalence of Underweight in children under 5 years by age group in Free State*

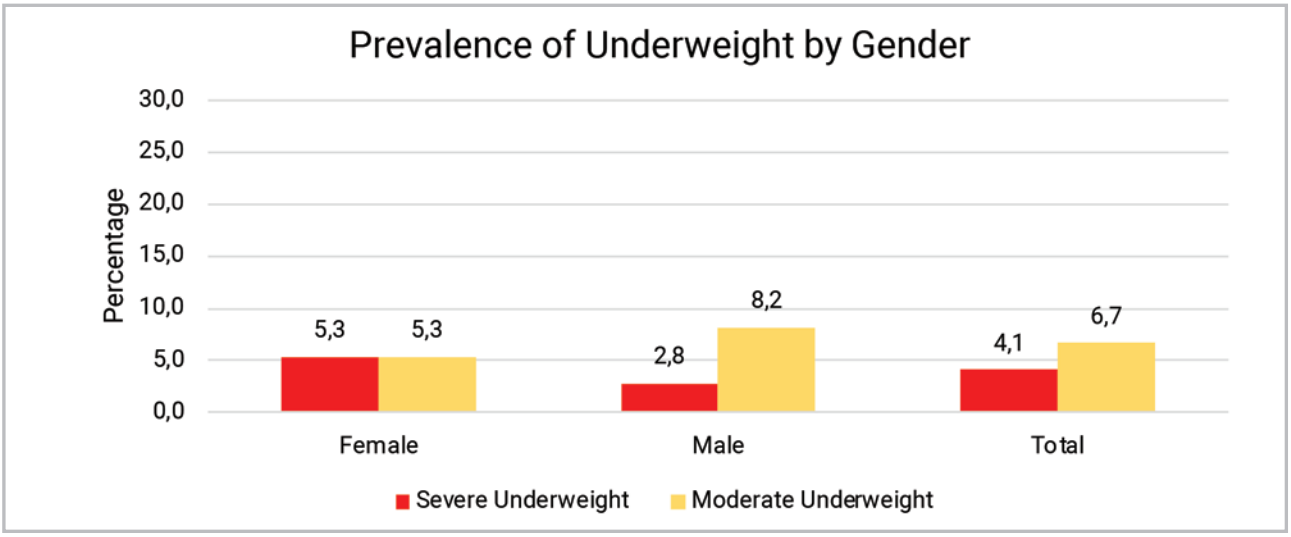


Figure 69: *The prevalence of Underweight in children under 5 years by gender in Free State*

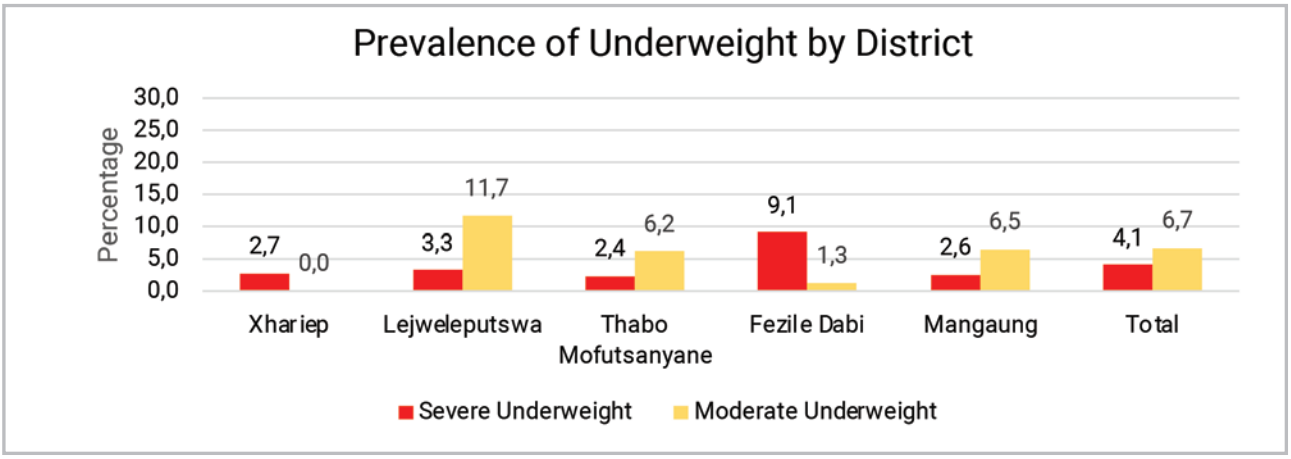


Figure 70: *The prevalence of Underweight in children under 5 years by district in Free State*

8.1.2.4 Overweight

The overall prevalence of overweight for children under the age of 5 years (n=354) was 15.0%, of which 6.1% was severe and 9.0% was moderate overweight (Table 57 and Figure 70). The prevalence of overall overweight appeared to decrease with age; however, there were no significant differences between age groups for overall overweight. A similar trend was followed for moderate overweight, with no significant differences between age groups. However, for severe overweight, there was a significant difference observed, where children younger than 6 months (12.9%) and those aged 18-29 months (11.1%) had a significantly higher prevalence of severe overweight than those aged 30-41 months (0.5%).

Males had a higher prevalence of overweight (16.9%) compared to females (13.4%) (Table 57 and Figure 71). While these differences were not significant, it does appear that males had a higher prevalence of moderate overweight (10.8% vs 7.3%), and both males and females had the same prevalence of severe overweight (6.1%).

Mangaung and Lejweleputswa districts reported the highest overall prevalence of overweight (19.7% and 19.1%, respectively), while the Thabo Mofutsanyane District reported the lowest overall prevalence (6.5%). There were, however, no significant differences in overall overweight reported at a district level. Similar results were observed for moderate overweight. For severe overweight, however, the Fezile Dabi District had the highest prevalence (12.5%), with the lowest prevalence in the Mangaung District (2.9%). This, however, was also not significant (Table 57 and Figure 72).

Table 57: The prevalence of overweight in children under 5 years by age, sex and district in Free State

	Not overweight WHZ<2		All overweight WHZ>=2		Moderate overweight WHZ>=2 and <3		Severe overweight WHZ>=3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	73.9	[52.7-87.8]	26.1	[12.2-47.3]	13.3	[4.3-34.3]	12.9	[4.4-32.0]	45
6-17	77.0	[56.2-89.7]	23.0	[10.3-43.8]	16.9	[5.5-41.7]	6.1	[2.5-13.9]	97
18-29	83.5	[67.7-92.5]	16.5	[7.5-32.3]	5.4	[1.6-16.3]	11.1	[4.1-26.8]	74
30-41	97.1	[86.9-99.4]	2.9	[0.6-13.1]	2.3	[0.3-14.5]	0.5	[0.1-3.8]	67
42-53	96.8	[86.9-99.3]	3.2	[0.7-13.1]	1.2	[0.2-8.8]	2.0	[0.3-13.4]	53
54-59	-	-	-	-	-	-	-	-	18#
Gender									
Female	86.6	[76.5-92.8]	13.4	[7.2-23.5]	7.3	[2.9-17.1]	6.1	[2.7-13.3]	190
Male	83.1	[70.8-90.9]	16.9	[9.1-29.2]	10.8	[3.9-26.5]	6.1	[3.3-11.0]	164
District									
Xhariep	90.9	[65.1-98.1]	9.1	[1.9-34.9]	6.0	[0.8-34.7]	3.2	[0.7-13.9]	31
Lejwele-putswa	80.9	[65.1-90.6]	19.1	[9.4-34.9]	12.9	[4.7-30.8]	6.2	[2.6-13.9]	110
Thabo Mofutsan-yane	93.5	[87.5-96.7]	6.5	[3.3-12.5]	3.1	[1.1-8.7]	3.4	[1.3-8.4]	87
Fezile Dabi	83.6	[72.8-90.6]	16.4	[9.4-27.2]	3.9	[1.1-13.2]	12.5	[5.8-24.9]	84
Mangaung	80.3	[51.6-93.9]	19.7	[6.1-48.4]	16.8	[4.3-47.8]	2.9	[0.4-19.3]	42
Total	**85.0**	**[77.5-90.3]**	**15.0**	**[9.7-22.5]**	**9.0**	**[4.5-17.2]**	**6.1**	**[3.6-10.0]**	**354**

* cell sample sizes too small to generate reasonable estimate # n<30

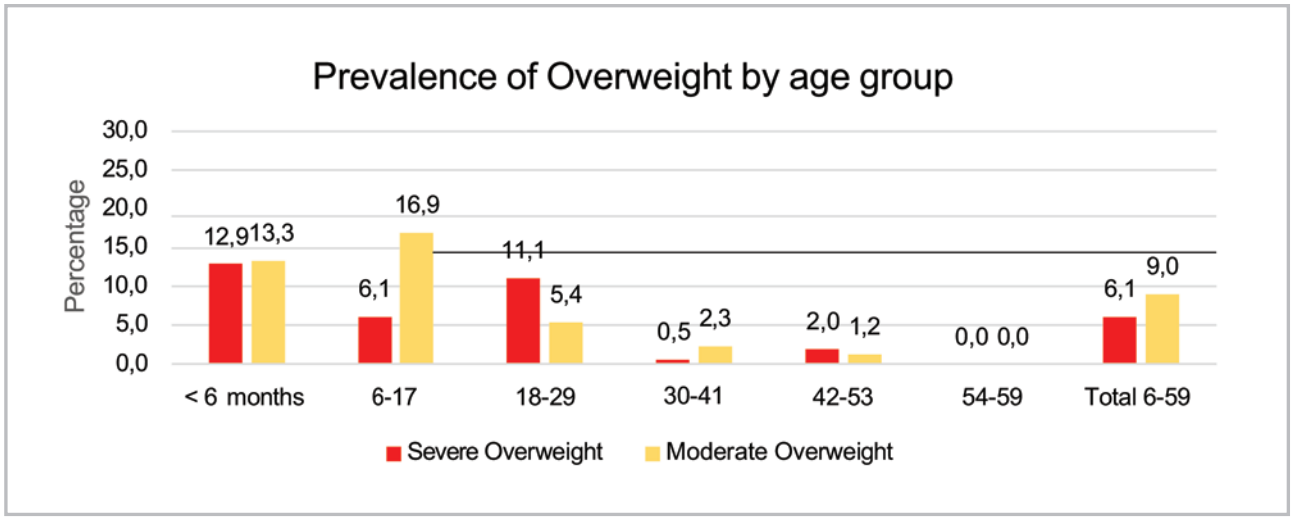


Figure 71: *The prevalence of Overweight in children under 5 years by age group in Free State*

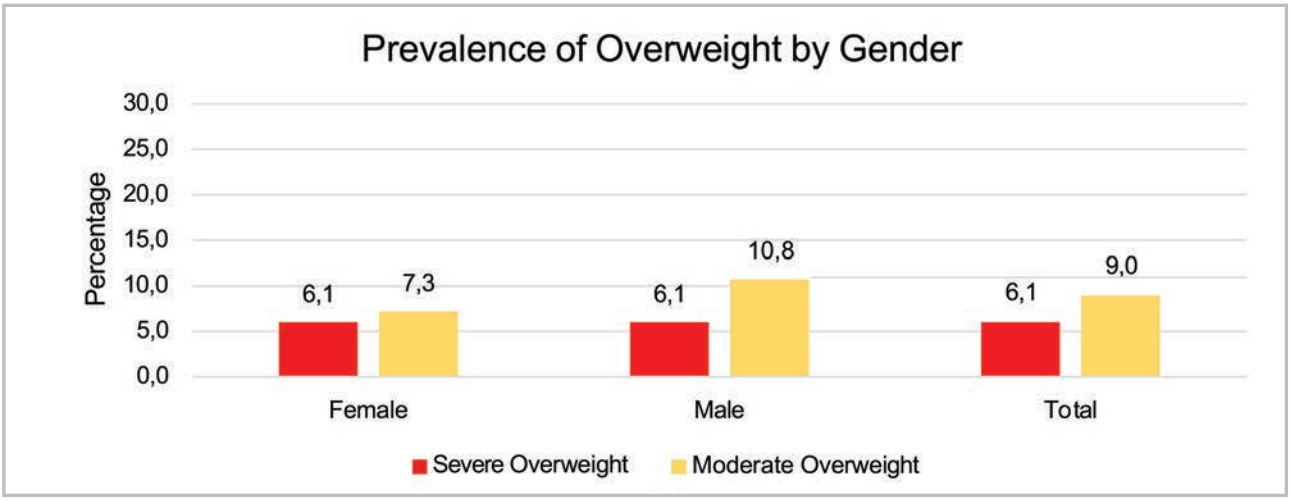


Figure 72: *The prevalence of overweight in children under 5 years by gender in Free State*

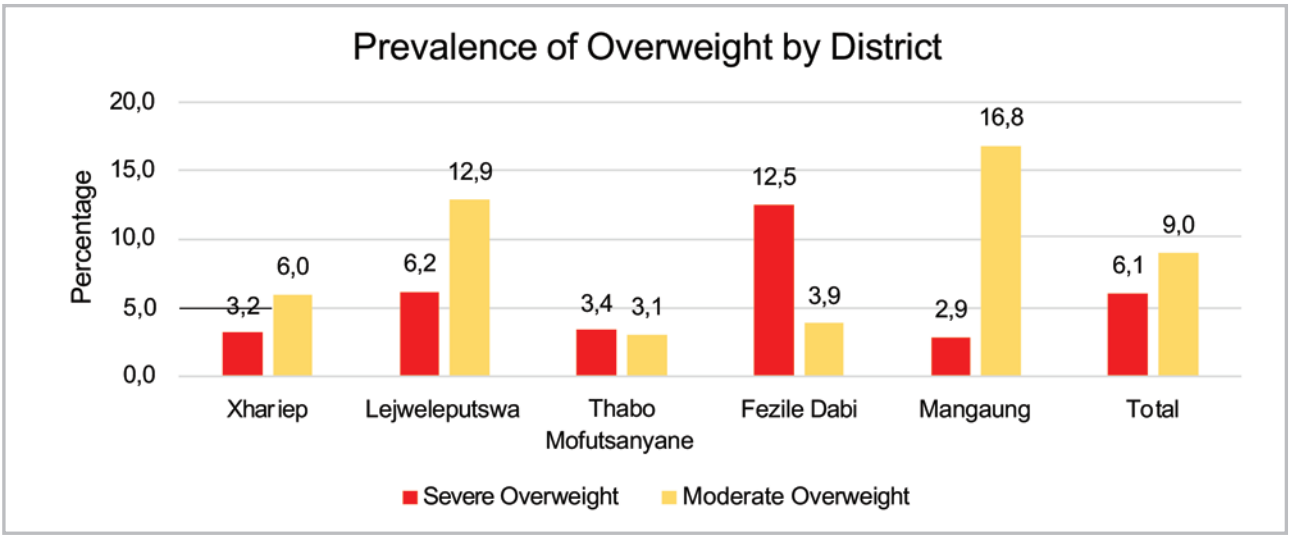


Figure 73: *The prevalence of Overweight in children under 5 years by district in Free State*

8.2 Anthropometry (18 years and older)

8.2.1 Body Mass Index (BMI)

The mean BMI for adults aged 18 years and older (n=2647) in Free State was 26.9 kg/m^2. This was significantly different between males (22.4 kg/m^2; 95% CI 21.9-23.0) and females (29.4 kg/m^2; 95% CI 28.8-30.0). There were also significant differences in mean BMI between individuals of different age groups, with those aged 18-24 years having a significantly lower mean BMI (23.1 kg/m^2) than those aged 25 years and older (range 26.7-30.0 kg/m^2). Furthermore, those aged 25-34 years, also had a significantly lower mean BMI (26.7 kg/m^2) compared to those aged 35 years and older (range 28.8-30.0 kg/m^2). At a district level, there were no significant differences in mean BMI.

Overall, 52.3% were classified as either overweight (22.2%) or obese (30.1%). 36.4% were classified as normal weight and 11.3% were classified as underweight (Figure 73). When disaggregating by gender (Females n=1687, Males n=952), the proportion of both overweight (25.4% vs 16.5%) and obesity (42.8% vs 7.3%) was higher in females than in males, respectively (Figure 74). While this tended towards significance for overweight, it was significantly different for obesity, with nearly six times more females being obese compared to males. Overall, nearly three quarters (68.2%) of females in Free State Province were either overweight or obese compared to less than one quarter (23.8%) of males. Conversely, the prevalence of underweight in females (5.4%) was

significantly lower, at about a quarter of that in males (21.8%). While the results for obesity and underweight are significantly different between the genders, the results for other weight categories were not significantly different between genders.

When disaggregating by gender (Males n=426. Females n=869), the proportion of both overweight (16.5% vs 25.4%) and obesity (7.3 vs 42.8) is higher in females than in males, respectively (Figure 74). While 10% more females are overweight, nearly 30% more females are obese compared to males. Conversely, the prevalence of underweight in females (3.8%) is about half of that in males (7.7%). While the results for obesity and normal weight are significantly different between the genders, the results for underweight and overweight are not significantly different.

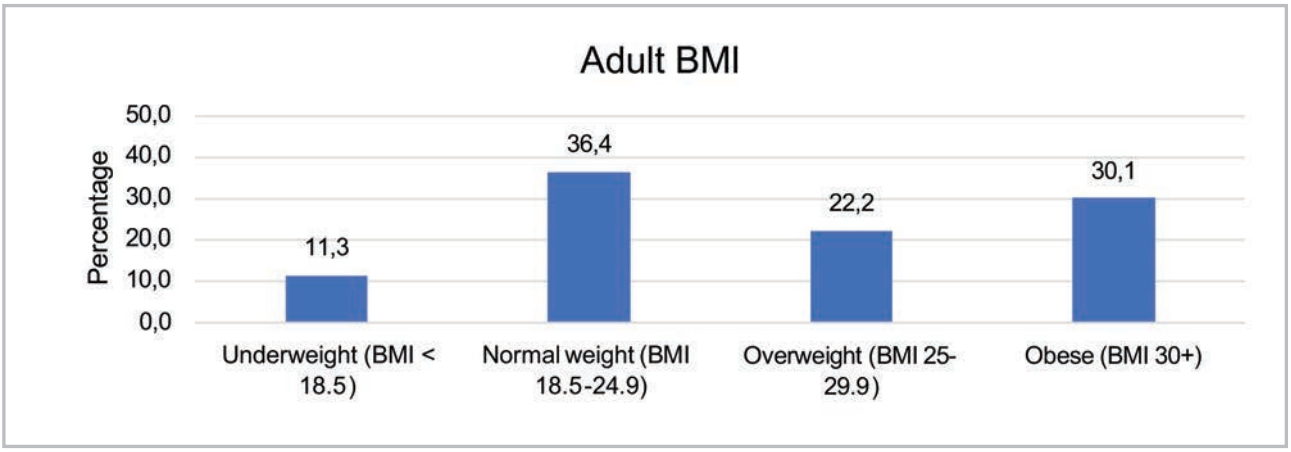


Figure 74: *Distribution of BMI in adults aged 18 years and older across all districts in Free State*

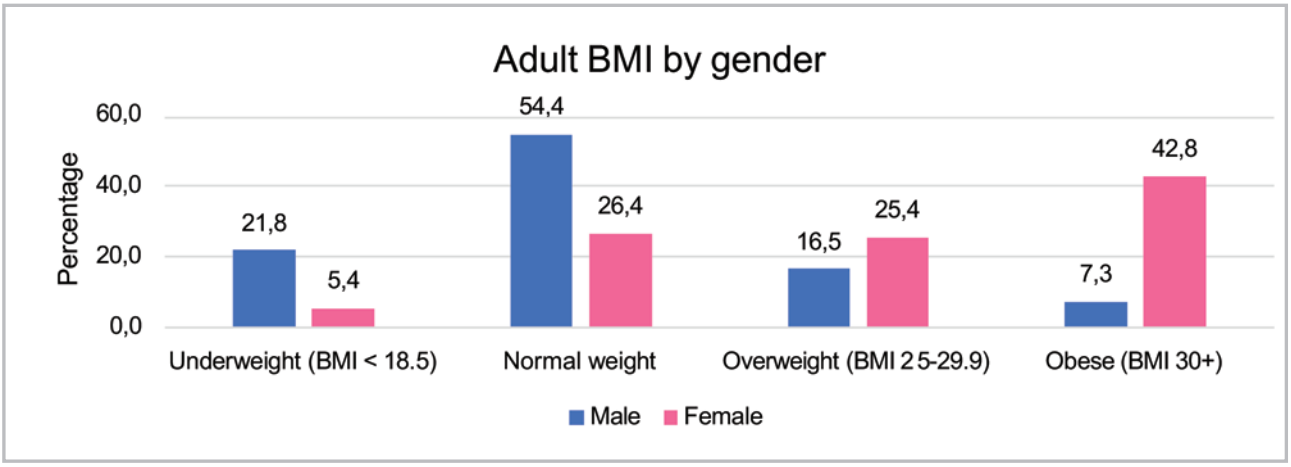
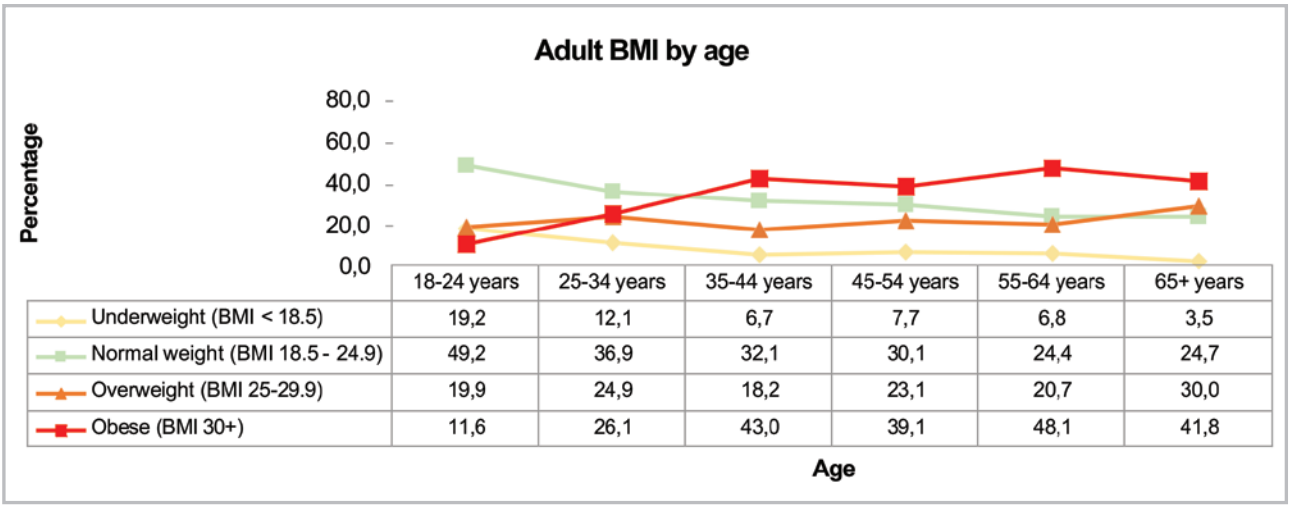


Figure 75: *Distribution of BMI in adults aged 18 years and older by gender in Free State*

When disaggregating the overall adult population by age, those aged 65 years and older have the highest prevalence of overweight (30.0%) and the 55-64 years age group had the highest prevalence of obesity (48.1%) (Figure 74). There was a significant difference in the prevalence of overweight, where those aged 35-44 years had a significantly lower prevalence (18.2%) than those aged 65 years and older (30.0%). There were also significant differences in obesity between age groups, where those aged 18-24 years had a significantly lower prevalence of obesity (11.6%) compared to those aged 25 years and older (range 26.1%-48.1%). Furthermore, those aged 25-34 years also had a significantly lower prevalence of obesity (26.1%) compared to those aged 35 years and older (range 39.1-48.1%). The prevalence of underweight ranged from 3.5%-19.2% across all age groups, with those aged 18-24 years having a significantly higher prevalence of underweight (19.2%) compared to those aged 35-44 years (6.7%), 55-64 years (6.8%), and those aged 65 years and older (3.5%).

Figure 75 compares BMI differences by age group between males and females. These figures clearly illustrate that underweight is lower in females (2.1-13.8%) than males (8.6%-26.1%) across all age categories. Conversely, for the most part, both overweight (18.5%-30.5% vs 6.7%-29.7%) and obesity (18.8%-56.4% vs 2.6%-23.2%) is higher in females than males across all age categories, respectively. The only exception is in the 45-54 years age group, where males have a higher prevalence of overweight (23.8%), compared to females at 23.0%.



	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65+ years
Underweight (BMI < 18.5)	19,2	12,1	6,7	7,7	6,8	3,5
Normal weight (BMI 18.5 - 24.9)	49,2	36,9	32,1	30,1	24,4	24,7
Overweight (BMI 25-29.9)	19,9	24,9	18,2	23,1	20,7	30,0
Obese (BMI 30+)	11,6	26,1	43,0	39,1	48,1	41,8

Figure 76: *Distribution of BMI in adults aged 18 years and older by age categories in Free State*

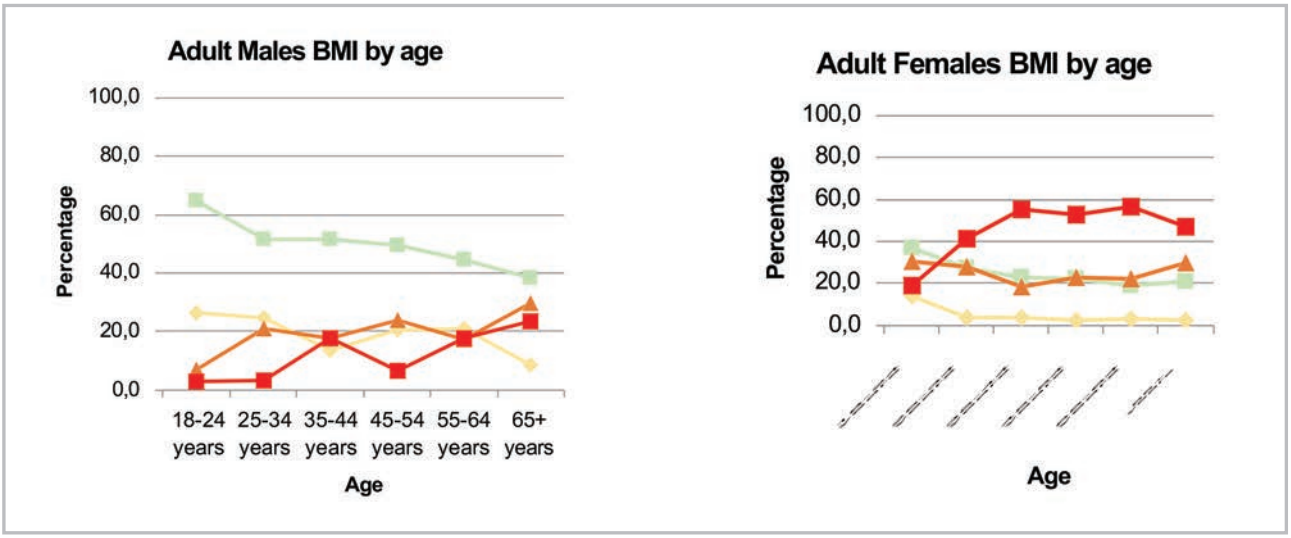


Figure 77: *Comparison of the distribution of BMI in adults aged 18 years and older by age and gender in Free State*

Figure 78 shows the disaggregation of BMI at the district level. There were no significant differences in BMI categories at a district level. Figure 79 compares district level data by gender. In both genders, these figures illustrate that in all districts, females have higher rates of overweight and obesity than males have. Generally, there were no significant differences within BMI categories at a district level for both males and females.

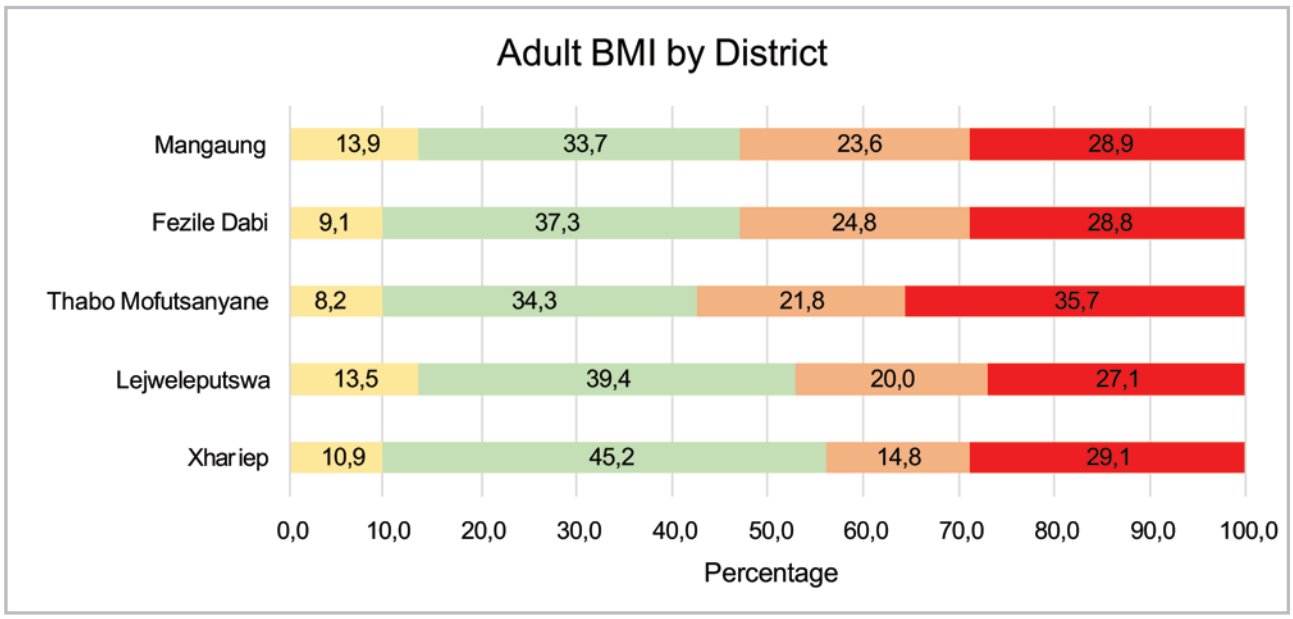


Figure 78: *Comparison of the distribution of BMI in adults aged 18 years and older by districts in Free State*

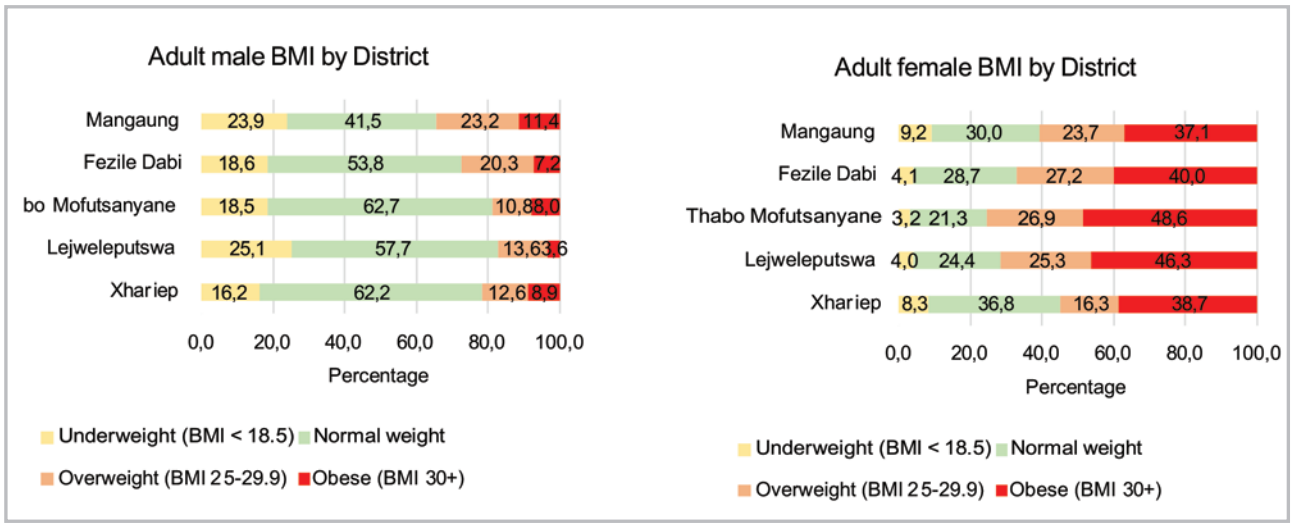


Figure 79: *Comparison of the distribution of BMI in adults aged 18 years and older by districts and gender in Free State*

8.2.2 Waist Hip Ratio

A waist hip ratio (WHR) ≥ 1 in males and ≥ 0.85 in females is indicative of an increased risk of non-communicable diseases (NCDs) such as diabetes and hypertension, amongst other illnesses. The mean waist hip ratio for males (n=972) and females (n=1706) was 0.87 (range: 0.86-0.88) and 0.85 (range: 0.84-0.86), respectively. However, Table 58 shows that overall, a far greater proportion of females (46.1%) had a high WHR compared to only 6.6% of males.

Table 58: Waist hip ratio (WHR) of adults aged 18 years and older in Free State by gender, age, and district in Free State

	Males					Females				
	Waist-hip ratio		Waist hip ratio>=1			Waist-hip ratio		Waist hip ratio >= 0.85		
	Mean	95% CI	%	95% CI	n	Mean	95% CI	%	95% CI	n
Age group										
18-24	0.83	[0.82-0.85]	1.4	[0.4-5.0]	138	0.81	[0.79-0.82]	26.4	[16.2-40.0]	184
25-34	0.85	[0.83-0.88]	5.7	[2.7-11.8]	226	0.84	[0.82-0.85]	38.8	[32.2-45.8]	377
35-44	0.9	[0.89-0.92]	11.7	[7.1-18.8]	218	0.86	[0.84-0.88]	53.4	[45.4-61.3]	336
45-54	0.91	[0.88-0.95]	4.0	[1.8-8.6]	155	0.88	[0.84-0.92]	57.6	[50.9-64.1]	291
55-64	0.93	[0.89-0.97]	17.2	[9.1-30.1]	126	0.88	[0.87-0.90]	66.8	[58.3-74.4]	273
>=65	0.94	[0.92-0.96]	22.6	[13.6-35.1]	109	0.88	[0.87-0.90]	66.3	[57.2-74.3]	245
District										
Xhariep	0.90	[0.87-0.94]	7.6	[4.2-13.4]	148	0.88	[0.85-0.91]	60.8	[49.9-70.7]	260
Lejwele-putswa	0.85	[0.83-0.87]	4.7	[2.0-10.6]	239	0.84	[0.83-0.85]	47.5	[39.6-55.4]	407
Thabo Mofutsan-yane	0.90	[0.87-0.93]	9.2	[4.3-18.6]	201	0.87	[0.84-0.90]	46.5	[39.2-53.9]	381
Fezile Dabi	0.87	[0.86-0.88]	5.6	[3.0-10.3]	219	0.85	[0.84-0.86]	47.3	[39.9-54.8]	379
Mangaung	0.87	[0.85-0.88]	7.5	[4.7-11.7]	165	0.83	[0.82-0.84]	41.9	[34.3-50.0]	279
Total	**0.87**	**[0.86-0.88]**	**6.6**	**[4.6-9.5]**	**972**	**0.85**	**[0.84-0.86]**	**46.1**	**[42.3-49.9]**	**1 706**

Table 58 and Figure 80 illustrate that WHR tends to increase with age in males and females, peaking in the age group 65 years and older. There were significant differences between age groups in both female and male age groups. Amongst males, those aged 18-24 years had a significantly lower prevalence of an increased WHR (1.4%) compared to all other age groups (range 5.7%-22.6%), except those aged 45-54 years (4.0%). Furthermore, in males, those aged 25-34% and those aged 45-54 years also had a significantly lower prevalence (5.7% and 4.0%) compared to those aged 65 years and older (22.6%). Similar results were observed in females, where those aged 18-24 years had a significantly lower prevalence of an increased WHR (26.4%) compared to those aged 35 years and older (range 53.4%-66.8%). Furthermore, in females, those aged 25-34% also had a significantly lower prevalence (38.8%) compared to those aged 45 years and older (range 57.6%-66.8%).

There were no significant differences in the mean WHR and the proportion of those who had a high WHR among both males and females across the various districts in Free State Province. Overall, all districts indicated females having significantly higher WHR compared to males (Table 58 and figure 80).

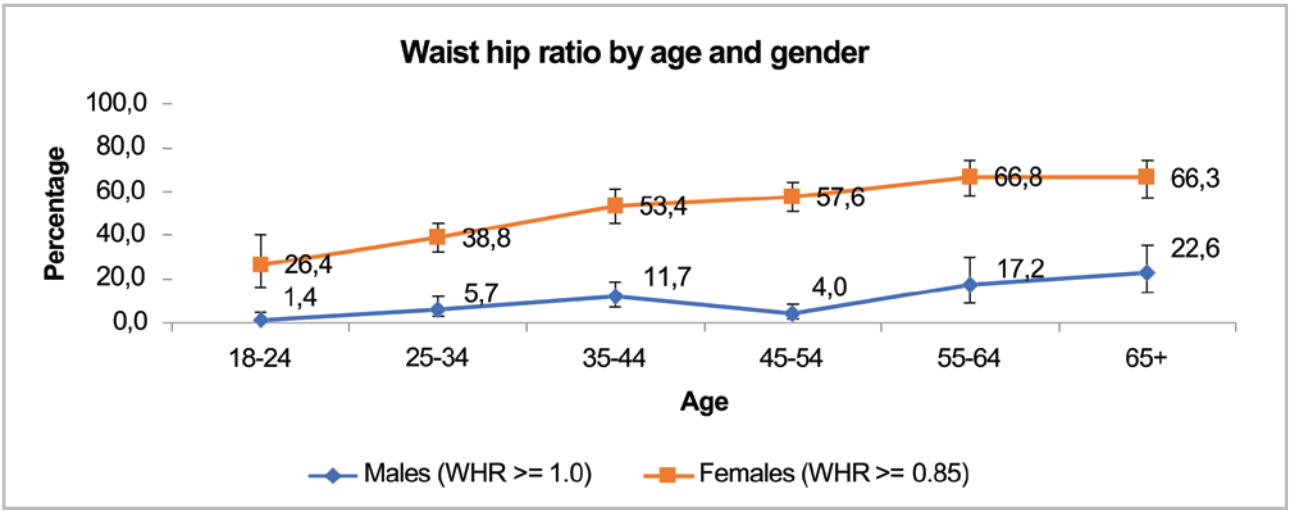


Figure 80: *Comparison of the distribution of WHR in adults aged 18 years and older by age and gender in Free State*

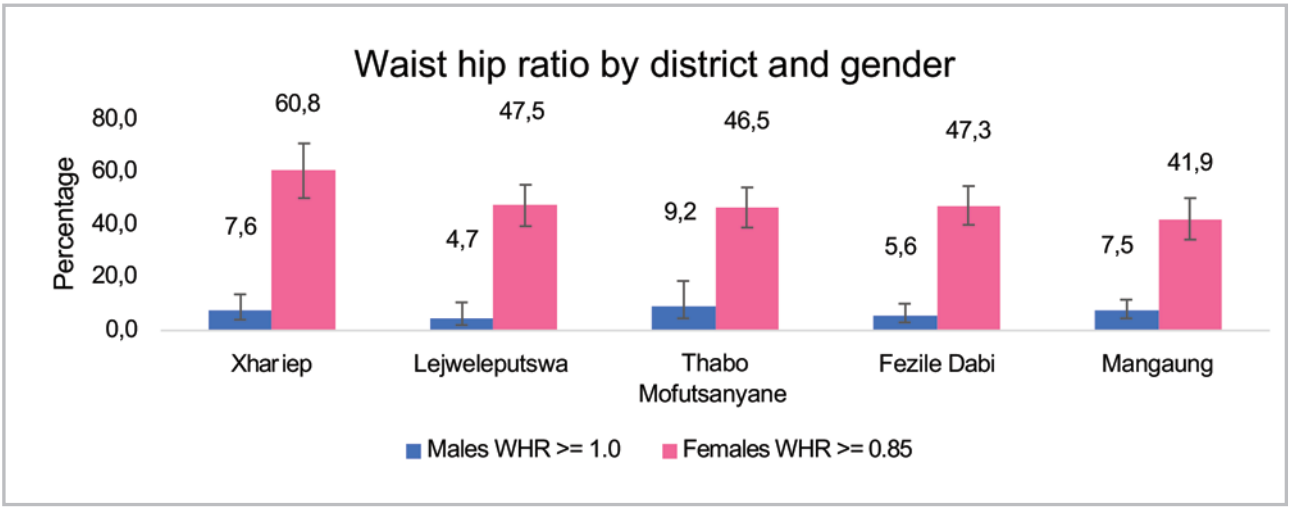


Figure 81: *Comparison of the distribution of WHR in adults aged 18 years and older by districts and gender in Free State*

8.3 Individual Dietary Diversity

A variety of foods in the diet is needed to ensure an adequate intake of essential nutrients. Dietary diversity can be used as a proxy measure of the nutritional quality of a population's diet, as well as an indicator of the access dimension of household food security (Kennedy, 2009). Populations consuming a diet of low dietary diversity are nutritionally vulnerable (Kennedy, 2009).

In this survey, adult participants and caregivers of children aged 6 months-5 years were asked to recall all foods and drinks they or their child had consumed the previous day. These food items were then allocated to specific food groups. A dietary diversity score (DDS) was calculated by summing the number of food groups from which food had been consumed; the nine food groups were: cereals, roots and tubers; vitamin A rich vegetables and fruit; vegetables other than vitamin A-rich; fruit other than vitamin A-rich fruit; meat, poultry, and fish; eggs; legumes; dairy products; and foods made with fats or oils. Each food group was counted only once. A DDS below four is low and to be associated with dietary inadequacies Steyn et al., 2006.

The mean dietary diversity score (DDS) for children aged 0-5 years residing in the Free State (n=345) was 3.75, which is indicative of an inadequate dietary diversity (Table 59). District comparisons showed that Fezile Dabi District had the highest mean DDS (4.71) compared to Thabo Mofutsanyane District, which had

the lowest (3.11), albeit these were not significant. Table 59 also shows that while children in two of the five districts have an adequate dietary diversity (DDS >4), those in Lejweleputswa, Thabo Mofutsanyane and Mangaung districts reported a low dietary diversity (DDS <4). There were, however, no significant differences across gender, age groups and districts for those who reported a low DDS.

Table 59: Dietary diversity scores for children aged 0-5 years in Free State

	Dietary Diversity Score		Dietary Diversity Score category				
			0-3		4-9		
	Mean	95% CI	%	95% CI	%	95% CI	n
Age (months)							
0-24 months	3.40	[2.87-3.92]	64.6	[53.7-74.2]	35.4	[25.8-46.3]	155
25-60 months	4.08	[3.62-4.54]	43.8	[33.6-54.6]	56.2	[45.4-66.4]	190
Gender							
Male	3.64	[2.98-4.31]	53.6	[41.4-65.4]	46.4	[34.6-58.6]	162
Female	3.84	[3.44-4.25]	54.6	[44.9-63.9]	45.4	[36.1-55.1]	182
District							
Xhariep	4.13	[3.54-4.72]	47.2	[35.0-59.6]	52.8	[40.4-65.0]	31
Lejweleputswa	3.99	[3.40-4.58]	52.3	[38.5-65.7]	47.7	[34.3-61.5]	102
Thabo Mofutsanyane	3.11	[2.61-3.62]	66.3	[50.6-79.0]	33.7	[21.0-49.4]	98
Fezile Dabi	4.71	[3.53-5.89]	29.3	[15.9-47.5]	70.7	[52.5-84.1]	78
Mangaung	3.22	[2.47-3.98]	66.4	[52.7-77.9]	33.6	[22.1-47.3]	36
Total	**3.75**	**[3.36-4.14]**	**53.9**	**[45.9-61.7]**	**46.1**	**[38.3-54.1]**	**345**

Figure 82 illustrates the proportion of the children aged 0-5 years in the Free State and in the various districts who have low and acceptable DDS. Overall, 46.1% of children in the Free State reported an adequate DDS, while 53.9% have a low DDS. Fezile Dabi district reported the lowest proportion of children with low DDS (29.3%), while the Mangaung and Thao Mafutsanyane districts reported the highest proportion of people with a low DDS (66.4% and 66.3%).

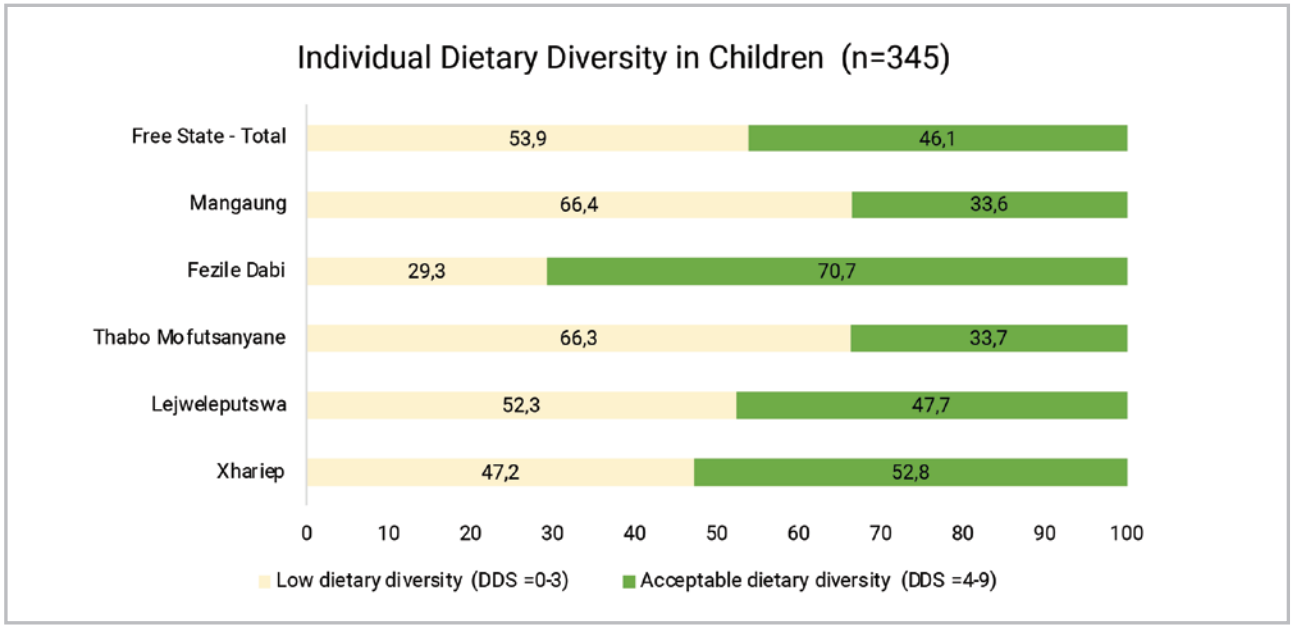


Figure 82: *Comparison of the distribution of DDS in children aged 0-5 years by districts in Free State*

The mean dietary diversity score (DDS) for adults residing in the Free State Province (n=3055) was 4.06, which is indicative of an adequate dietary diversity (Table 60). District comparisons showed that Lejweleputswa District had the highest mean DDS (4.23) compared to the Thabo Mofutsanyane District, which had the lowest (3.76). Table 60, therefore, shows that individuals in four of the five districts have an adequate dietary diversity (DDS >4), while only those in Thabo Mofutsanyane District reported a low DDS (<4). These differences were, however, not significant. Similarly, there were no significant differences across gender and age groups for those who reported a low DDS.

Table 60: Mean Dietary diversity scores for adults in Free State

	Dietary Diversity Score	Dietary Diversity Score category					
		0-3		4-9			
	Mean	95% CI	%	95% CI	%	95% CI	n
Age group							
18-24	3.93	[3.59-4.27]	51.9	[42.2-61.4]	48.1	[38.6-57.8]	364
25-34	4.18	[3.92-4.45]	46.5	[40.0-53.0]	53.5	[47.0-60.0]	674
35-44	4.01	[3.79-4.22]	44.4	[38.8-50.1]	55.6	[49.9-61.2]	608
45-54	3.92	[3.63-4.21]	47.6	[40.9-54.3]	52.4	[45.7-59.1]	508
55-64	4.16	[3.81-4.50]	41.4	[34.1-49.0]	58.6	[51.0-65.9]	464
>=65	4.14	[3.89-4.40]	41.8	[36.1-47.8]	58.2	[52.2-63.9]	439
Gender							
Male	3.97	[3.74-4.19]	48.2	[41.6-54.9]	51.8	[45.1-58.4]	1 120
Female	4.1	[3.89-4.32]	46.1	[41.3-50.9]	53.9	[49.1-58.7]	1 928
District							
Xhariep	4.09	[3.65-4.53]	42.4	[36.0-49.0]	57.6	[51.0-64.0]	566
Lejweleputswa	4.23	[3.86-4.59]	45.1	[35.3-55.3]	54.9	[44.7-64.7]	681
Thabo Mofutsanyane	3.76	[3.40-4.13]	53.9	[45.1-62.5]	46.1	[37.5-54.9]	634
Fezile Dabi	4.17	[3.77-4.57]	42.7	[32.8-53.3]	57.3	[46.7-67.2]	615
Mangaung	4.08	[3.74-4.42]	45.5	[39.4-51.8]	54.5	[48.2-60.6]	561
Total	**4.06**	**[3.88-4.23]**	**46.8**	**[42.6- 51.1]**	**53.2**	**[48.9- 57.4]**	**3 055**

Figure 83 illustrates the proportion of the adult population in the Free State Province and in the various districts who have low and acceptable DDS. Overall, 53.2% of people in the Free State Province reported an adequate DDS, while 46.8% have a low DDS. Xhariep District reported the lowest proportion of people with low DDS (42.4%), while Thabo Mofutsanyane District reported the highest proportion of people with a low DDS (53.9%). These differences, though, were also not significant.

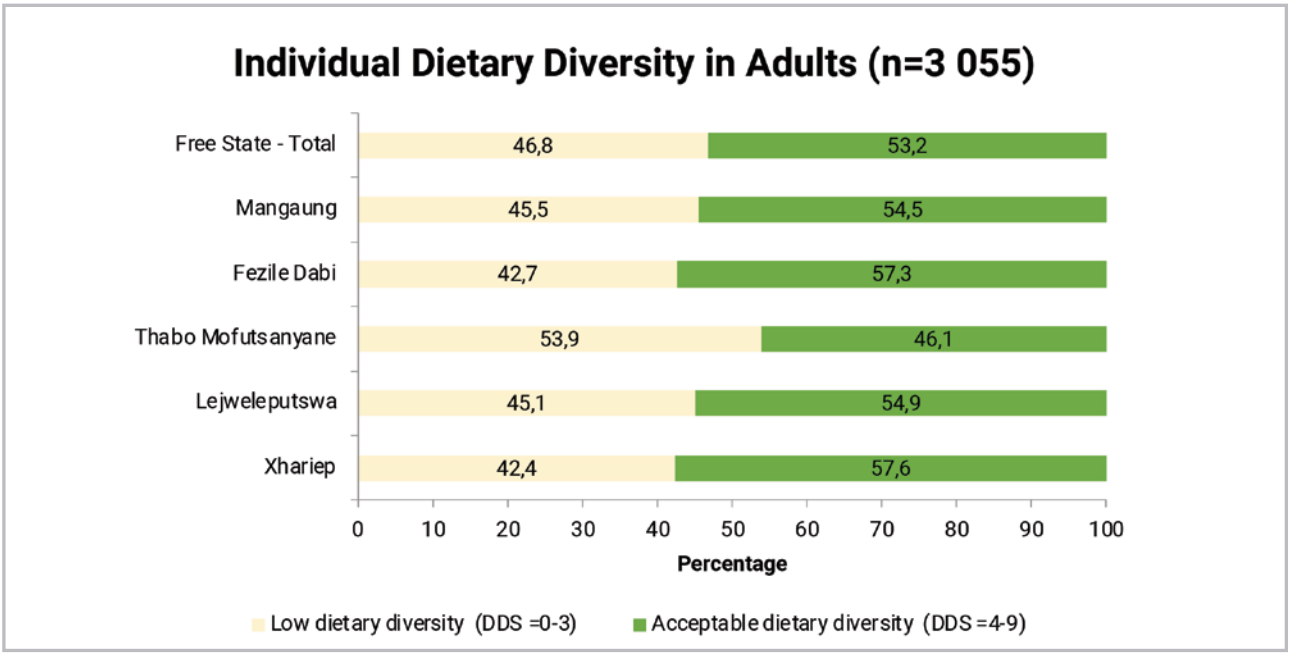


Figure 83: *Comparison of the distribution of DDS in children aged 0-5 years by districts in Free State*

8.4 Relationship of Household Food Insecurity and Malnutrition in Free State Province

Table 61 presents the relationship between nutrition and food security status in the Free State Province. It shows the extent to which household food security status can predict malnutrition among household members for children (0-5 years) and adults. The table shows that the occurrence of stunting (height-for-age) was more likely among food insecure households than food secure households. Among children who were stunted, 83.8% were from food insecure households, whereas among those who were not stunted, 80.8% were from food secure households. Similarly, the table shows that wasting (height-for-weight), underweight (weight-for age), and overnutrition (overweight) among children were more likely among food insecure households than in food secure households. Among those children that were wasted, 90.2% were residents of food insecure households, while among those not wasted, a marginally lower proportion (82.2%) were in the food insecure households. While 85.4 of children who were underweight were residents of food insecure households, 81.7% of those who were not underweight were residents of food insecure households. These results suggest that household food insecurity is associated with higher chances of both chronic and acute undernutrition, together with obesity/ overweight, in children in the Free State Province. The results imply that households that experience access to food challenges are not only eating less, but they are also eating the wrong foods, resulting in overweight and malnourished children.

Table 61: Relationship between household food insecurity and malnutrition indicators in the Free State

Nutrition indicators	Categories	Food security status (%)		Chi-square tests
		Food secure	Food insecure	
0-5 years				
Stunting	Yes	16.2	83.8	
	No	19.2	80.8	
Wasting	Yes	9.8	90.2	
	No	17.8	82.2	
Underweight	Yes	14.6	85.4	
	No	18.3	81.7	
Overweight	Yes	13.7	86.3	
	No	18.1	81.9	
Adults				
Underweight	Yes	19.5	80.5	+ **
	No	28.6	71.4	
Obesity / Overweight	Yes	27.3	72.7	
	No	28.2	71.8	
Increase risk of NCDs (Waist / hip ratio)	Yes	25.3	74.7	
	No	28.6	71.4	
Individual Dietary Diversity	Low	9.6	90.4	***
	Acceptable	30.1	69.9	

The relationship between nutrition and food security indicators was significant among the adults in the Free State Province. Table 61 indicates that, among underweight adults, 80.5% were in the food insecure households, while among adults that were not underweight, 71.4% were residing in food insecure households. This indicates that underweight among adults was more likely to occur among food insecure households than food secure households. Further, the results show that, among those who were obese/ overweight, 27.3% were from food secure households, while 28.2% of those not obese/ overweight were from food secure households. A lower proportion of those with acceptable diets were in the food insecure households (63.1%) compared to those with low diets (76.7%).

8.5 Discussion

Infant feeding practices

Exclusive breastfeeding has been adopted as one of the keys, and crucially important, components of the Infant and Young Child Feeding Policy which was developed in 2007 (DoH, 2011). Promotion, protection, and support of breastfeeding are a key focus area of infant and young child feeding of the Integrated Nutrition Programme of the Department of Health.

The results of this study indicate that 84.8% of children under 2 years were breastfed at some point in their lives, which is very similar to the national results reported in the SADHS in 2016 (84%).

Furthermore, the results of this study indicated that nearly 72.7% of children aged 0-2 years in the Free State Province were introduced to breastfeeding immediately after birth with a total of 88.8% being breastfed within an hour of birth. These results are slightly higher than the national results reported by the SAHANES in 2012 (83.0%), and far higher than the national results reported by the SADHS in 2016 (67%).

Exclusive breastfeeding in Free State was reported to be 28.1%. This should be interpreted with caution due to the small sample size. However, 28.1% is far higher than the national reports in the 2003 SADHS (8.3%) and SANHANES 2012 (7.5%) and more in line with that reported by Shisana et al. in 2008 (25.7%) and the 2016 SADHS (30%).

In 1998, 2003 and 2016, the SADHS reported an average duration of breastfeeding of 15.6 months, 16.6 months, and 12.2 months, respectively. SANHANES, however, showed a much lower average duration of breastfeeding (5.9 months). The average duration of breastfeeding for those who were not currently breastfed during this study was 5.7 months, which is more in line with what the SANHANES reported compared to the SADHS.

Overall, the first drink other than breastmilk was mainly introduced at 0-1months. This occurred in more than a third (37.6%) of children. We can assume that this is most likely the introduction of infant formula, for mothers who may be unable to breastfeed. At 3 months, other drinks were introduced in a further 16.3% of children. Less than a quarter of children (23.1%) were first introduced to other drinks at the age of 6 months/ older. With regards to the type of drink that was first introduced, nearly half (48.1%) indicated infant formula, while 20.1% indicated plain water.

After 6 months, infants should be introduced to solid foods as breastmilk is no longer sufficient to meet the nutritional requirements. However, the results of this study indicates that complementary feeding is initiated slightly earlier than the anticipated 6 months at 5.3 months. This is about a month later than the results of the SANHANES 2012 (4.5 months). The most common food introduced is commercial cereal/ porridge (44.2%) and homemade cereal/porridge (21.7%), followed closely by pureed/mashed vegetables/fruit (20.2%).

Anthropometry (0-5 years)

In 2012, the SANHANES reported a national stunting prevalence of 28.6% in children 0-5 years, and a provincial prevalence of 34.7% in the Free State. Four years later, in 2016, the SADHS reported a slightly lower stunting prevalence at the national (27.0%) level and similar prevalence at the provincial (34%) level. The results of the current study appear to indicate that the stunting prevalence in the Free State is slightly lower than both the SANHANES and SADHS provincial prevalence, with a current prevalence of 30.5% in children of the same age group. These results indicate that stunting has decreased over the last 10 years, and as such, the proportion of children experiencing chronic undernutrition in 2021 has reduced. The SADHS reported that stunting was more prevalent nationally in the age group 18-23 months. The result of this provincial analysis corroborates this, as children aged 18-29 months had the highest prevalence of stunting in the Free State. Furthermore, the SANHANES and SADHS has reported that stunting is more prevalent in male children than female children at a national level. While this study shows similar trends at a provincial level, the gap between males and females is quite small, where 32.1% of males are stunted compared to 29.0% of females. At a district level, the current study reported that stunting is more prevalent in the Xariep and Lejweleputswa districts; however, this was not significantly higher than other districts.

The national prevalence of wasting was reported to be 3.7% in 2012 (SANHANES), with a slightly lower provincial prevalence in the Free State of 2.1%. In 2016 similar national results were presented in the SADHS (3.0%); however, a provincial prevalence was not reported at the time. The current study has reported a similar but slightly higher provincial prevalence of wasting in the Free State of 4.7%, thereby indicating that the proportion of children experiencing acute undernutrition in 2021 has increased slightly over the past 10 years. It also appears that those aged 6-17 months, as well as females, experience a higher prevalence of wasting than their counterparts. At a district level, the current study reported that wasting, while not significant, is more prevalent in the Manguang (6.2%) and Lejweleputsa (7.7%) districts, compared to the other districts (range 0.5% to 3.4%).

The prevalence of underweight in the Free State in the current study (10.8%) is twice as high as the provincial prevalence of underweight reported by the SANHANES in 2012 (5.1%). A lower prevalence was also reported at the national level in 2012 (6.8%) and 2016 (6%).

In 2016, the SADHS reported a national prevalence of overweight of 13% in children 0-5 years. SANHANES reported a higher prevalence in females than in males across all age categories at a provincial level. The current study found a slightly higher prevalence (15.0%) of children were overweight and that males had a higher prevalence of being overweight than females, though the differences between genders were not significant.

The above trends across time seem to indicate that over the last 10 years, chronic undernutrition in children in the Free State has decreased, but that acute undernutrition has increased. At a district level, it appears as if Xariep has the lowest prevalence of acute undernutrition (wasting and underweight), but the highest prevalence of chronic undernutrition.

Anthropometry (18 years and older)

At a national level, the mean BMI in females were reported to be 28.9 kg/m^2 in 2012 and 29.2 kg/m^2 in 2016. For males, there was no change in mean BMI between 2012 and 2016 as both the SANHANES and the SADHS reported a mean BMI of 23.6 kg/m^2. A similar provincial mean was reported for BMI in the Free State for females (29.6 kg/ m^2) and a slightly lower prevalence for males (22.5 kg/m^2) in 2012. Similar results were reported in 2016 (females 29.4 kg/m^2 and males 22.7 kg/m^2). The current study also reported similar results for both females (29.4 kg/m^2) and males (22.4 kg/m^2) in the Free State Province.

Based on BMI cut off points, SANHANES reported a national prevalence of overweight and obesity of 64.0% in females and 30.7% in males 10 years ago. The SADHS reported similar results in 2016, 67.5% in females and 31.3% in males. The provincial prevalence of overweight and obesity in Free State Province was similar to the national estimates for females (63.7%) and lower for males (25.3%) in 2012. In 2016, the SADHS reported a similar provincial prevalence in Free State Province among females (68.5%) and an increased prevalence in males (27.5%). Ten years later, the results of this study report a similar provincial prevalence of overweight and obesity among females (68.2%) and a lower prevalence in males (23.8%) compared to the SADHS.

The current study also reported a similar proportion of females (46.1%) and higher proportion of males (6.6%) regarding a waist hip ratio larger than 0.85 and 1.0, respectively, compared to previous studies. For females, SANHANES reported 47.1% and 46.7% at a national and provincial level, respectively. For males, SANHANES reported 6.8% and 2.7% at a national and provincial level, respectively.

Dietary Diversity

A diet that is sufficiently diverse reflects nutrient adequacy. This statement is because no single food contains all the required nutrients for optimal health. Consequently, the more food groups included in a daily diet, the greater the likelihood of meeting nutrient requirements (Kennedy, 2009). Monotonous diets, based mainly on starches such as maize, rice and bread, have been closely associated with food insecurity. Dietary diversity is an outcome measure of food security at the individual or household level (Kennedy, 2009). Apart from reflecting on food security, a low DDS has also been associated with low weight and stunted growth (Rah et al., 2010), as well as other health issues. In this survey, the mean dietary diversity score of the adult population was 4.06 with 46.8% of the population having a score of less than four.

While the mean DDS was similar to the NCFS in 2009 (4.02), it was slightly lower than that reported in SANHANES nationally in 2012 (4.2). However, the proportion of those with a low DDS was higher than that reported in both the SANHANEs in 2012 (40%) and the NFCS in 2009 (38%). This study further found that children have a lower mean DDS of 3.75, with a larger proportion (53.9% of children having a score of less than four.

9 Wellbeing and Associated Shocks

9.1 Household Health Status, Chronic Illnesses, and Diseases

The study sought to establish the disease burden and health experiences of household heads and members in the preceding year to the study, and as expected, the population experienced a wide range of diseases (Table 1). Most household heads reported having experienced coughs/colds/chest infections at 27.5% followed by hypertension (17.7%), headache (15.3%), eye infection (7.9%), and fever/malaria (9.2%) in that order. Cough/Cold/chest infections accounted for 23.6% of household members, followed by hypertension at 10.8%. These are commonly reported ailments some of which are simply symptoms rather than confirmed diseases. Nonetheless, the level of access to food and especially nutritious food predisposes individuals to a multitude of diseases and to the ability to prevent and indeed recover when such diseases are contracted. Specific diseases such as diabetes, for example, require specific diets as part of managing them and it is important that such households have access to diverse food stuffs, including medically prescribed diets.

Table 62: Disease experienced by household heads and members a year prior to the survey

	Household heads		Household members	
Disease	**n**	**%**	**n**	**%**
Cough/cold/chest infection	737	27.5	2215	23.6
Hypertension	719	17.7	1070	10.8
Headache	420	15.3	922	10.0
Eye infection	264	7.9	507	5.5
Fever/malaria	240	10.6	683	7.7
HIV/AIDS	240	7.6	460	4.9
Abdominal pains	236	7.5	404	4.4
Toothache or mouth infection	236	8.0	445	5.0
Diabetes	227	4.6	342	3.5
Other disease	197	6.7	422	4.5
Asthma	105	2.6	174	1.7
Diarrhoea	95	3.2	272	3.1
Skin rash	89	4.0	265	2.8
Paralysis	79	1.8	134	1.3
TB	58	1.6	101	1.0
Vomiting	45	1.4	135	1.5
Bronchitis/pneumonia/chest pain	30	0.6	65	0.7

The study found low prevalence of chronic illness (a disease that lasts for more than 3 months) at both the household (5.3%) and household member levels (4.0%) (Figure 83). The significance of this finding is that food and nutrition security is vital to managing most chronic diseases (such as TB and diabetes) as the nutritious status of foods that people eat assists in controlling recovery processes. The prevalence of chronic diseases adds to the need for ensuring that most households are food secure.

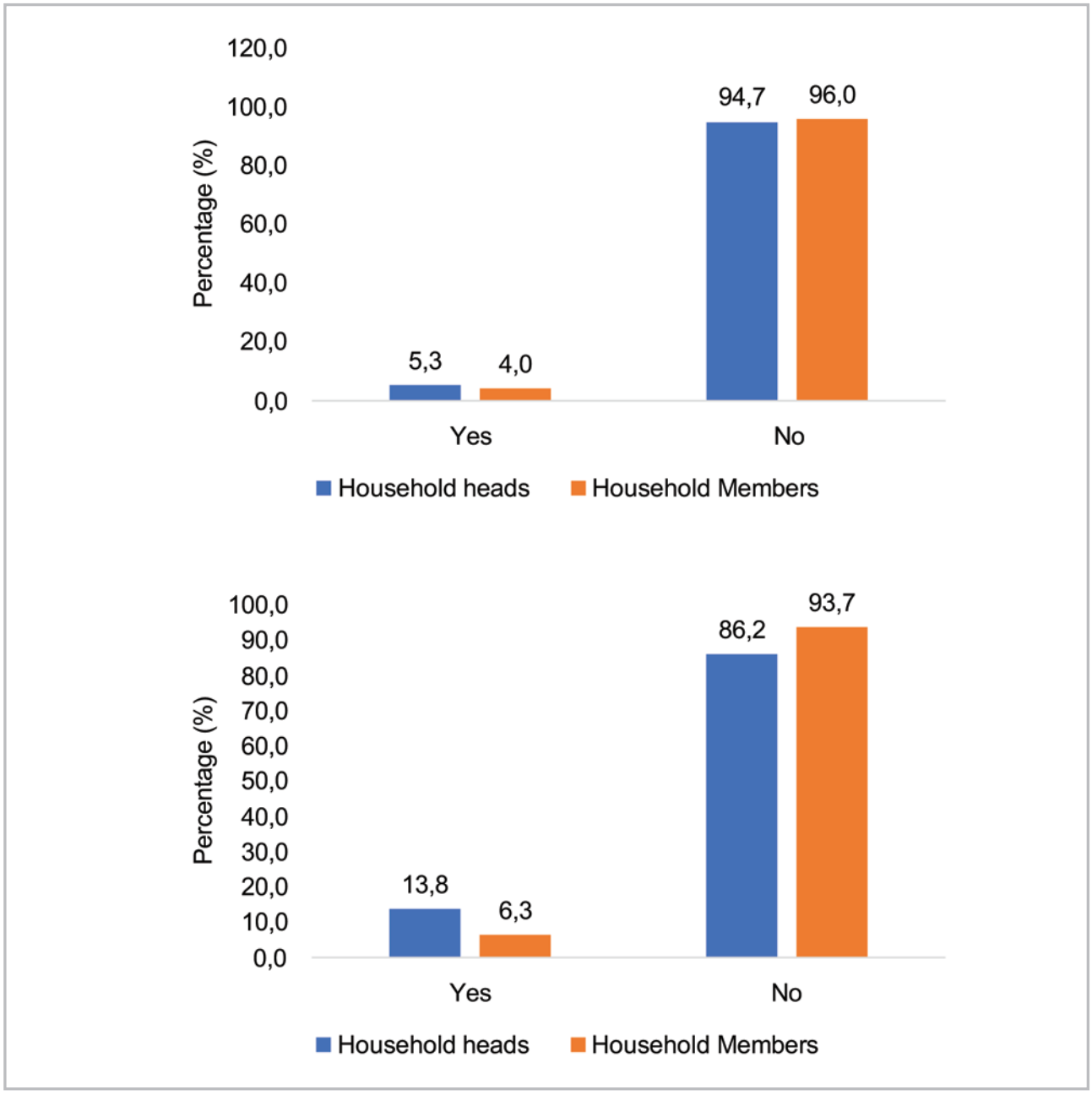


Figure 84: *Household heads and members reported to having been continuously ill, for at least 3 months in the last 12 months prior to the survey*

There was generally no difference in the reported or perceived health status of household heads by sex and district, but noticeable differences are observed, particularly by age (Table 63). Those aged 55 years and above reported significant levels of poor or fair health compared to those younger. The Thabo Mofutsanyane District had a slightly higher percentage (19.7%) of household heads who perceived their general health status as poor or fair. Overall, respondents felt that there were at least in perceived good health.

Table 63: Household heads' perceived health status by sex, age, and district

	Poor/Fair		Good		Very good/Excellent		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Female	9.6	[7.3-12.5]	62.6	[57.4-67.5]	27.9	[23.5-32.7]	1,467
Male	20.1	[15.9-25.0]	55.6	[49.9-61.2]	24.3	[19.9-29.2]	1,191
Total	**15**	**[12.5-18.0]**	**59**	**[54.4-63.4]**	**26**	**[22.5-29.8]**	**2,658**
Age group							
18-24	12.7	[4.9-29.1]	59.4	[44.0-73.1]	27.9	[17.5-41.3]	130
25-34	7	[4.2-11.5]	59.7	[51.1-67.7]	33.4	[26.7-40.8]	394
35-44	7	[4.6-10.3]	63.2	[57.7-68.4]	29.9	[24.9-35.3]	553
45-54	19	[14.5-24.4]	61	[55.2-66.5]	20.1	[16.3-24.5]	571
55-64	32.3	[27.5-37.4]	50.1	[43.3-56.9]	17.7	[13.3-23.0]	501
65+	36.6	[31.0-42.6]	53.1	[46.9-59.3]	10.2	[7.2-14.3]	509
Total	**15**	**[12.5-18.0]**	**59**	**[54.4-63.4]**	**26**	**[22.5-29.8]**	**2,658**
District							
Fezile Dabi	14.9	[10.8-20.2]	58.2	[51.9-64.2]	27	[22.5-32.0]	521
Lejweleputswa	14.2	[10.0-19.7]	60.1	[54.8-65.2]	25.7	[20.4-31.8]	524
Mangaung	12.4	[8.6-17.5]	59.2	[48.6-68.9]	28.4	[21.2-37.0]	663
Thabo Mofutsanyane	19.7	[13.3-28.2]	58.2	[48.9-67.1]	22	[15.4-30.6]	543
Xhariep	13.5	[10.0-18.1]	60.4	[44.5-74.4]	26.1	[15.4-40.7]	407
Total	**15**	**[12.5-18.0]**	**59.0**	**[54.4-63.4]**	**26**	**[22.5-29.8]**	**2,658**

A similar pattern is observed across household members by sex, age, and district (Table 64). Unsurprisingly, the elderly (55-64 years and 65 years and older) had the higher percentage of household members who were reported as having poor or fair health status, with 21.3% and 37.9%, respectively.

Table 64: Household members reported perceived health status by sex, age, and district

	Poor/Fair		Good		Very good/Excellent		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	8.3	[7.0-9.8]	55.2	[50.5-59.9]	36.5	[31.9-41.3]	2,874
Female	9.6	[7.9-11.6]	56.1	[51.5-60.7]	34.3	[29.8-39.2]	3,176
Total	**9**	**[7.6-10.6]**	**55.7**	**[51.2-60.1]**	**35.3**	**[30.9-40.0]**	**6,050**
Age group							
0-14	3.4	[2.2-5.1]	55.5	[49.8-61.0]	41.1	[35.6-46.9]	1,966
15-24	4.5	[3.2-6.3]	54.2	[48.0-60.2]	41.4	[35.4-47.6]	1,139
25-34	7.5	[5.6-9.8]	57.9	[52.6-63.0]	34.6	[29.8-39.8]	1,037
35-44	12.1	[9.3-15.6]	57.9	[52.7-63.0]	30	[25.2-35.3]	686
45-54	16.6	[12.6-21.6]	57.3	[51.1-63.3]	26	[21.0-31.7]	489
55-64	21.3	[16.7-26.7]	55.1	[47.8-62.1]	23.7	[17.8-30.7]	340
65+	37.9	[31.1-45.2]	48.7	[41.8-55.6]	13.5	[9.8-18.2]	280
Total	**9**	**[7.6-10.6]**	**55.7**	**[51.2-60.1]**	**35.3**	**[30.9-39.9]**	**5,937**
District							
Ehlanzeni	9.6	[7.5-12.3]	49.8	[43.2-56.3]	40.6	[34.0-47.5]	2 395
Gert Sibande	9.6	[7.5-12.2]	63.1	[56.4-69.3]	27.2	[21.3-34.2]	1 733
Nkangala	7.7	[5.6-10.5]	59.3	[51.4-66.8]	33.0	[25.7-41.3]	1 960
Total	**9.0**	**[7.6-10.6]**	**55.7**	**[51.2-60.1]**	**35.3**	**[30.9-39.9]**	**6 088**

A similar pattern is observed across household members by sex, age, and district (Table 65). Unsurprisingly, the elderly (55-64 years and 65 years and older) had the higher percentage of household members who were reported as having poor or fair health status, with 28.5% and 34.8%, respectively.

Table 65: Household members reported perceived health status by sex, age, and district

	Poor/Fair		Good		Very good/Excellent		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Female	7.8	[7.0-8.6]	62.7	[61.2-64.1]	29.5	[28.2-30.9]	4,299
Male	10.6	[9.8-11.5]	61	[59.7-62.3]	28.3	[27.1-29.6]	5,071
Total	**9.3**	**[8.8-9.9]**	**61.8**	**[60.8-62.8]**	**28.9**	**[28.0-29.8]**	**9,370**
Age group							
18-24	2.9	[2.3-3.6]	61.1	[59.2-62.9]	36	[34.2-37.9]	2,633
25-34	2.7	[2.0-3.6]	61.1	[58.7-63.4]	36.2	[33.9-38.5]	1,647
35-44	6	[4.8-7.3]	66.2	[63.7-68.6]	27.9	[25.6-30.3]	1,411
45-54	15.8	[13.6-18.3]	62.5	[59.3-65.6]	21.7	[19.1-24.5]	899
55-64	28.5	[25.3-31.9]	54.9	[51.2-58.5]	16.6	[14.1-19.5]	727
65+	34.8	[31.1-38.6]	53.4	[49.4-57.3]	11.9	[9.5-14.7]	607
Total	**9.5**	**[8.9-10.2]**	**61.6**	**[60.6-62.6]**	**28.9**	**[27.9-29.8]**	**9,037**
District							
Fezile Dabi	9.2	7.8-10.7	58.1	53.2-62.9	32.7	28.2-37.5	1,810
Lejweleputswa	9.4	7.7-11.5	55.5	52.7-58.2	35.1	32.0-38.4	1,932
Mangaung		[8.0-10.5]	66.7	[64.7-68.7]	24.1	[22.3-26.0]	2,137
Thabo Mofutsanyane	8.9	[7.8-10.2]	64.4	[62.3-66.3]	26.7	[24.9-28.6]	2,183
Xhariep	10.7	[9.2-12.5]	66.1	[63.5-68.6]	23.2	[21.0-25.6]	1,323
Total	**9.3**	**8.5-10.3**	**61.2**	**58.3-64.0**	**29.5**	**26.8-32.3**	**9,385**

Health Status by Municipality

Figure 84 shows that six municipalities (Letsemeng, Kopanong, Masilonyana, Ngwathe, Nketoane, and Maluti a Phofung) had the highest percentages of household members that reported poor or fair health status (9.9%-11.9%). Only Tswelopele and Mantsopa had very low levels of reported poor or fair health status.

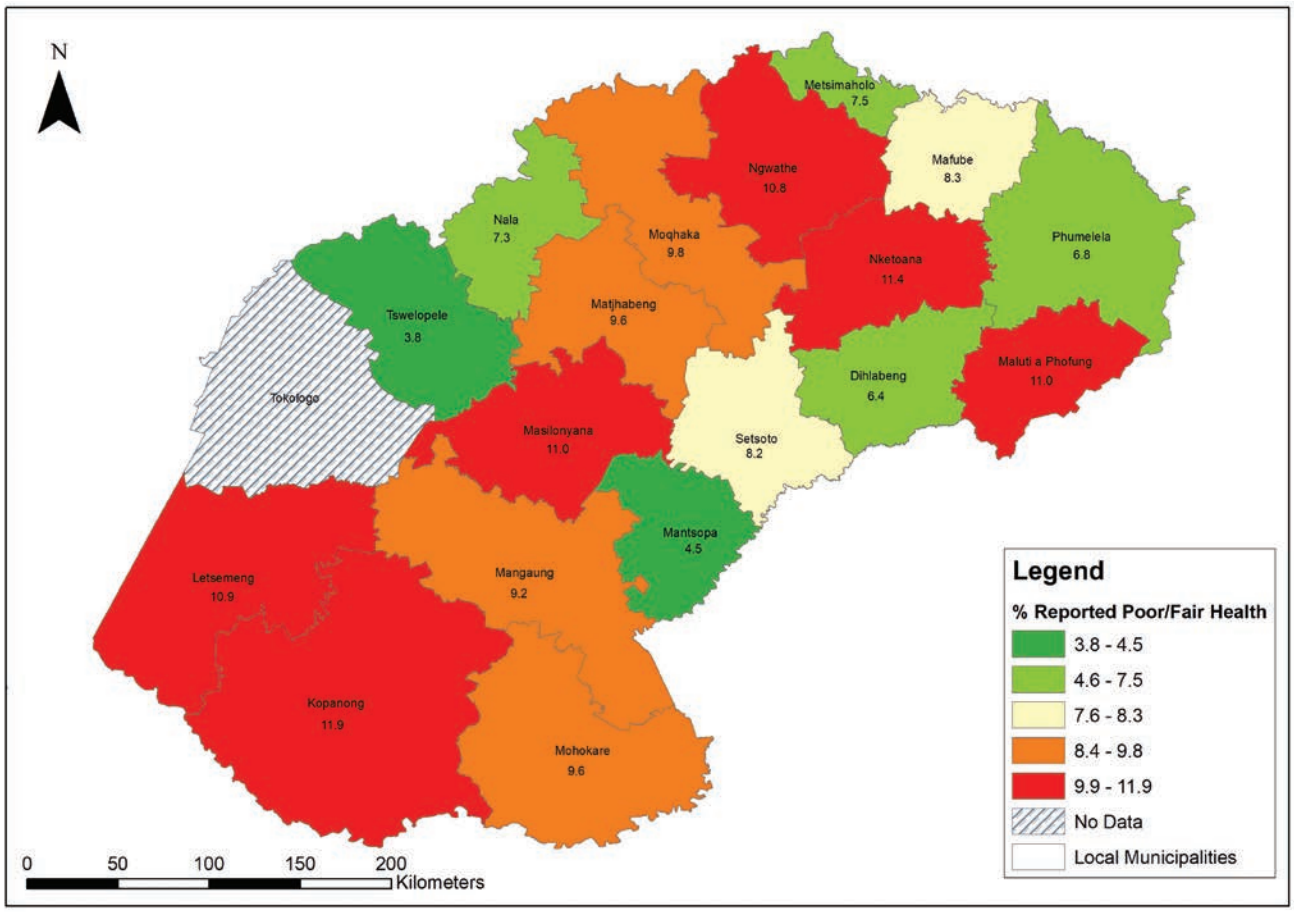


Figure 85: *Household members reported perceived health status by local municipality*

9.2 Shocks, COVID 19 Coping Strategies and their Associated Effect on Food Availability and Access

This section describes some of the shocks and their associated effects on household food availability. The COVID-19 coping strategies are also detailed in this section bearing in mind that the survey was conducted three weeks after the first COVID-19 lockdown, which affected household food access and availability in the study area.

9.2.1 Drought and water shortage

Shocks due to floods were not commonly reported across the five districts of the Free State Province. Within this province, over 80% of households in four of the five districts reported that they have not experienced floods (Figure 85). Few households in the province reported to have experienced flooding in the previous 12 months (note that the survey was conducted in 2022) (Figure 86). It should be noted that the Free State Province did experience some localised flooding in January 2022, hence there are some few households who have reported that they experienced flooding.

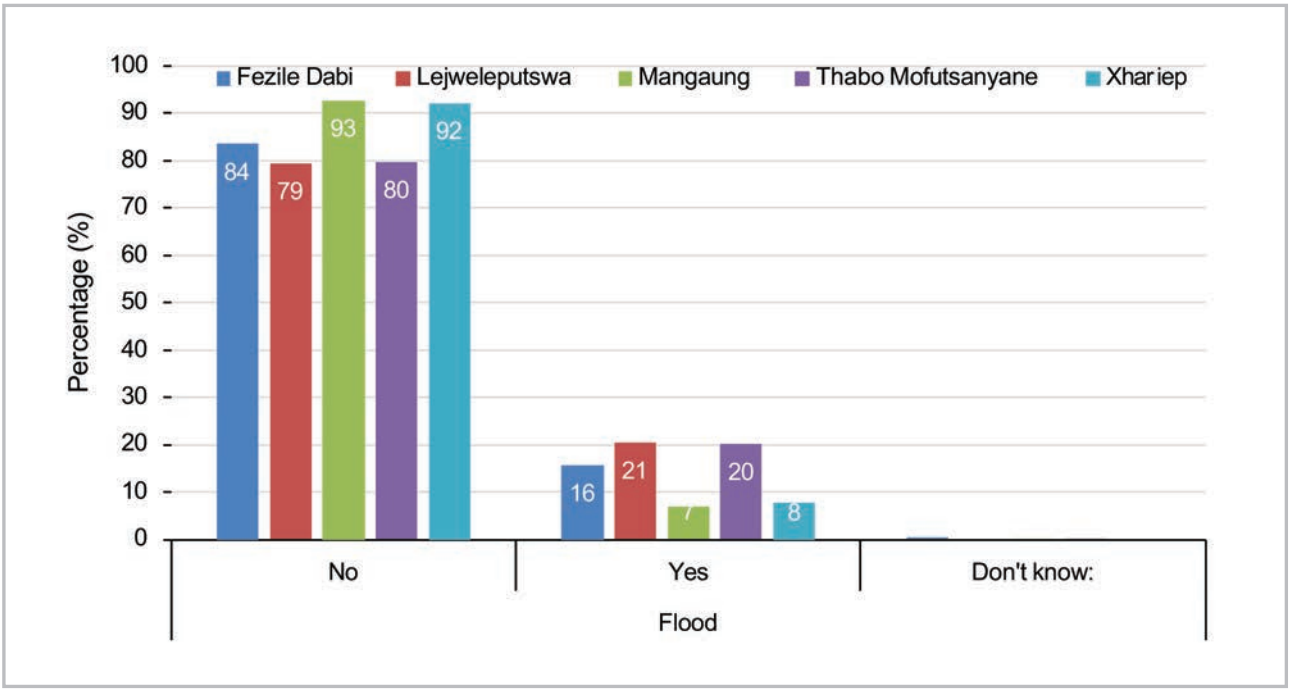


Figure 86: *Household that experience floods in the last 12 months in Free State Province*

Overall, the Free State Province experiences inter-annual variation when it comes to drought. It experiences years with wet summers, neutral, and dry seasons as shown by the figure below in which only a handful (less than 8% in all districts) have experienced drought shock during the study period. It should be noted that the province was experiencing severe drought and water shortages during the year 2019.

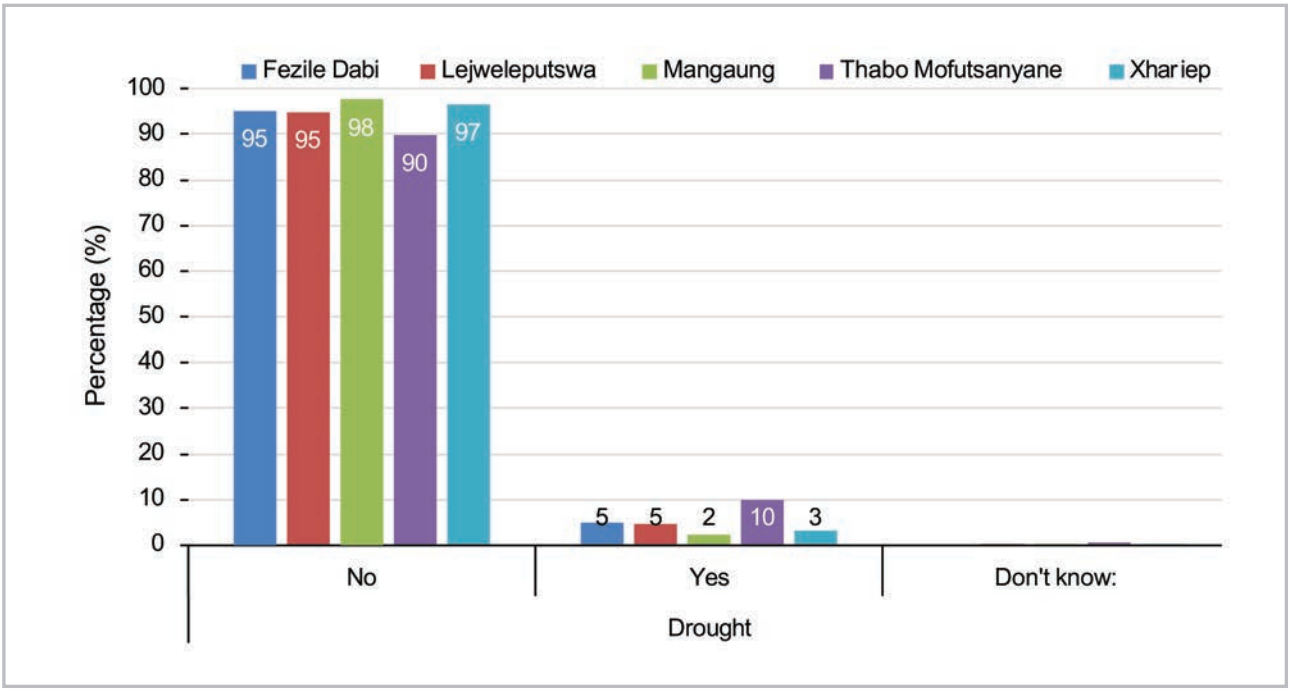


Figure 87: *Household that experience drought shock by district in the last 12 months in Free State Province*

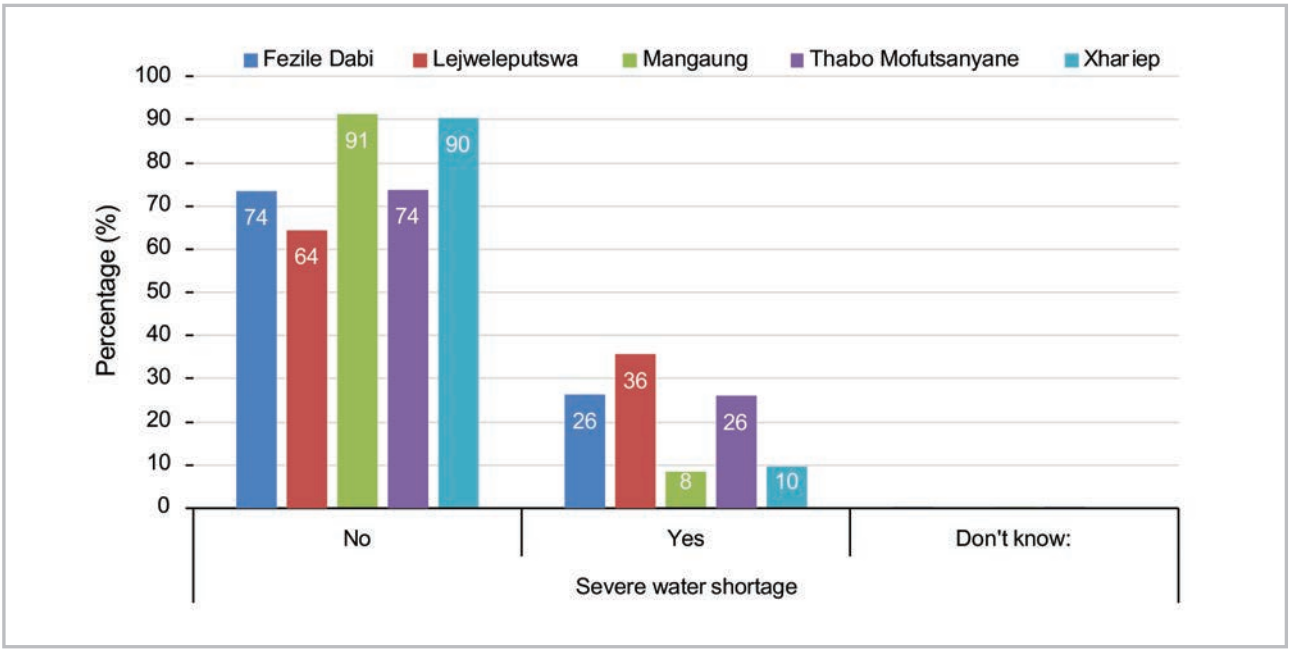


Figure 88: *Household that experience severe water shortage shock by district*

Severe water shortage is one of the shocks that was reported in most of the districts and was more pronounced in the Lejweleputswa (36%) District as depicted by the graph. However, severe water shortage was least reported in the Mangaung District (8%) (Figure 87).

9.2.2 Crop disease and crop failure

Figure 89 shows how households in Free State Province experienced the shock of crop failure. Most households involved in agriculture experienced crop failure with residents of Thabo Mofutsanyane district experiencing the highest (66%) while Xhariep district experienced the least (18%) in terms of crop failure. In general, this indicates that there is a need for irrigation and other water support systems for those households involved in crop farming in Free State Province.

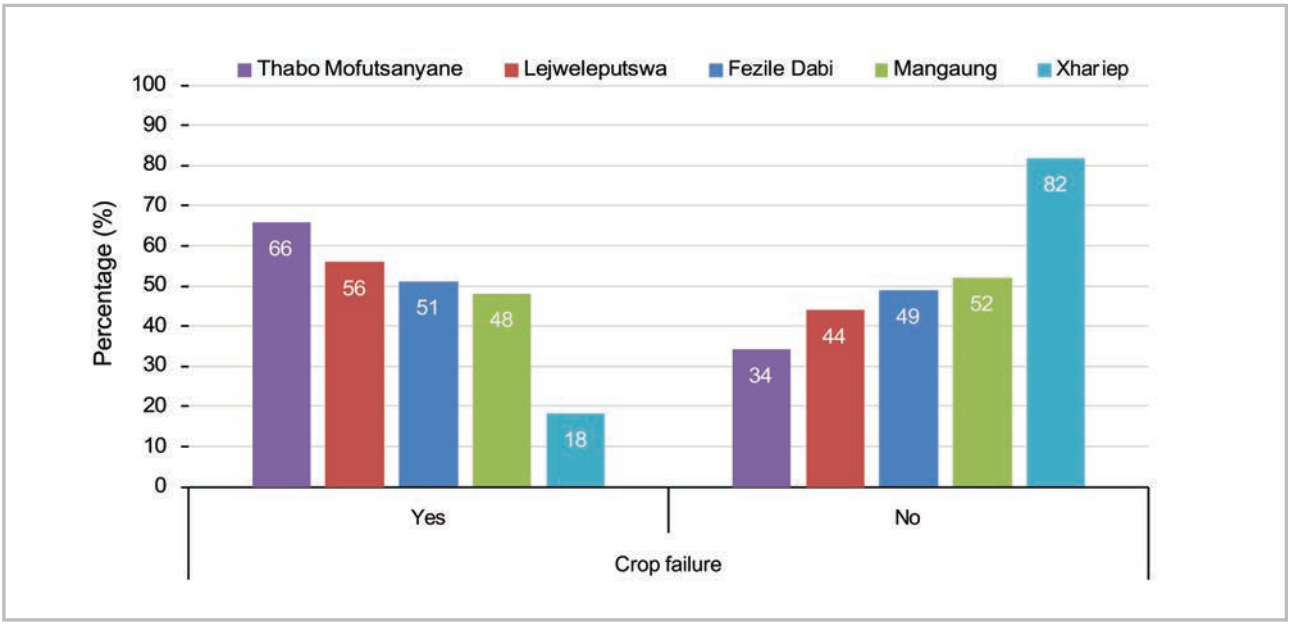


Figure 89: *Households that experienced crop failure shock disaggregated by district*

All the sampled households (100%) involved in crop farming in Mangaung district reported that they experienced crop diseases during farming in the past 12 months (Figure 89). The district that experienced the least crop diseases shock was Thabo Mofutsanyane (36%). Most of the districts reported high levels of crop disease shock hence there is need for interventions to support farmers in identifying these diseases.

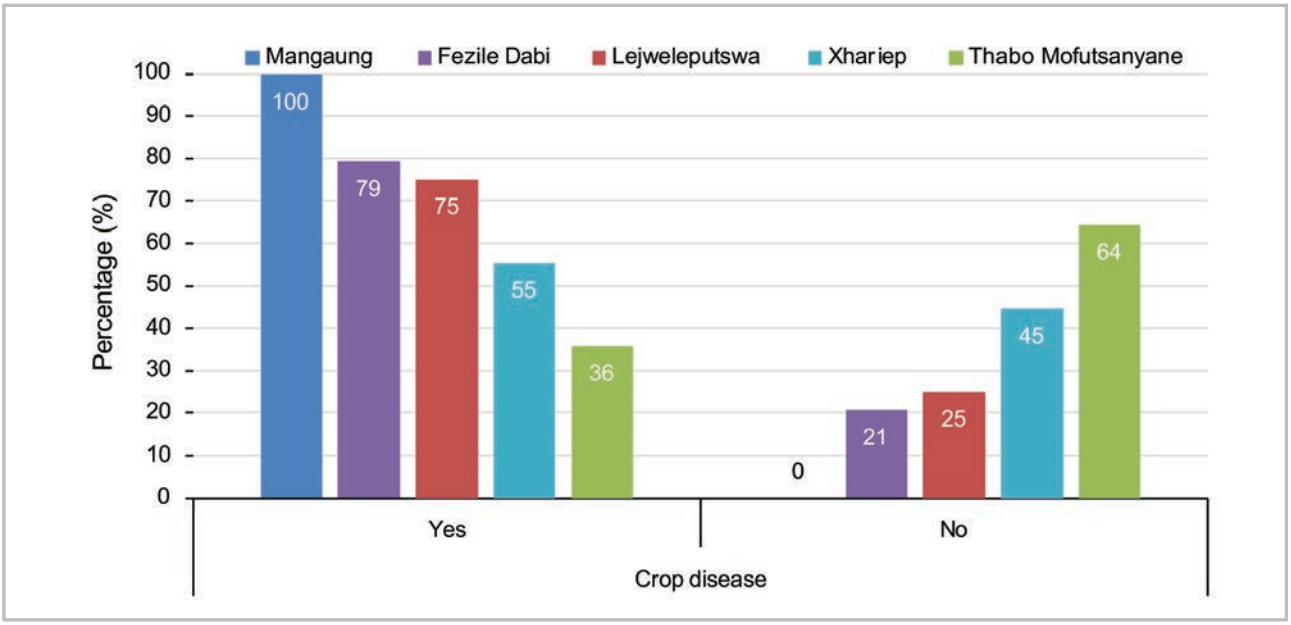


Figure 90: *Households that experienced crop disease shock disaggregated by district*

9.2.3 Increase in inputs and food prices

The increase in food prices was the biggest shock experienced across all the five districts in Free State Province. The highest shocks were experienced in the Fezile Daba and Lejweleputswa districts, with 75% and 71%, respectively. This is attributable to the idea that there was extremely limited food production globally, and shocks such as the COVID-19 pandemic would immediately trigger prices increases since the supply chains were disrupted.

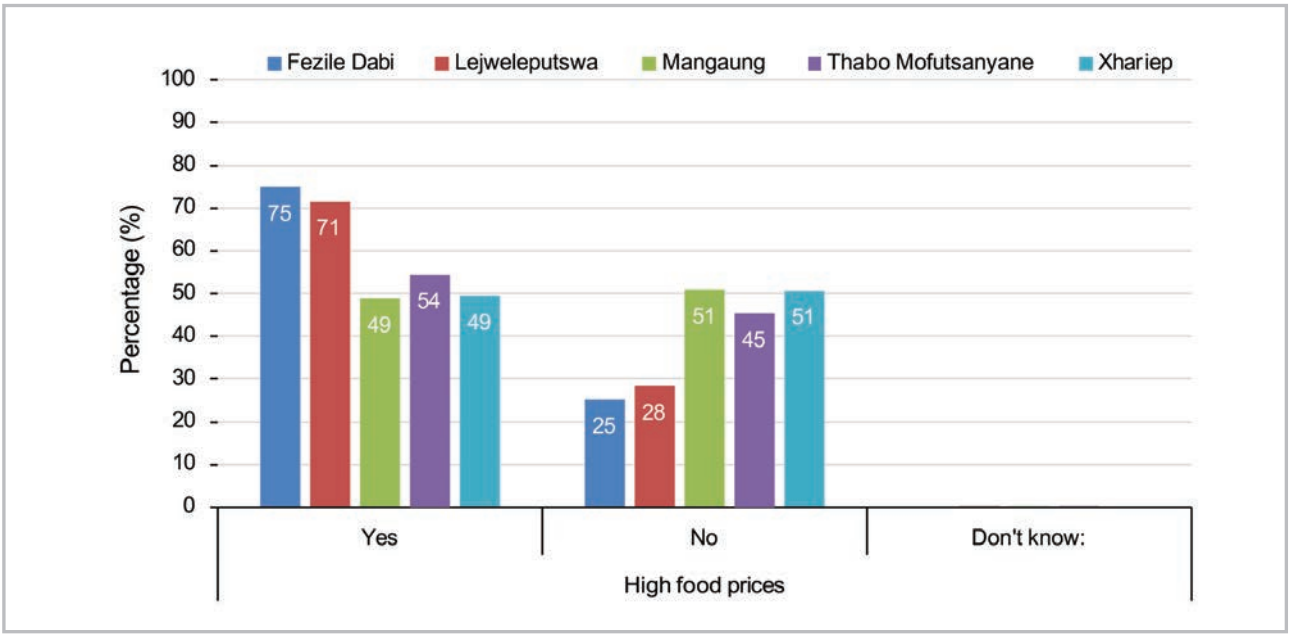


Figure 91: *Household that experience high food prices shock by district*

The increase in input prices were lowly reported in all the five districts (Figure 90). The low number of households who reported to have felt the increase in input cost is directly related to the fact that the households are not highly involved in agricultural production. The increase in input prices also has a direct effect on the increase in the food process, hence this justifies the reported increases in food prices across the four districts (Figure 91).

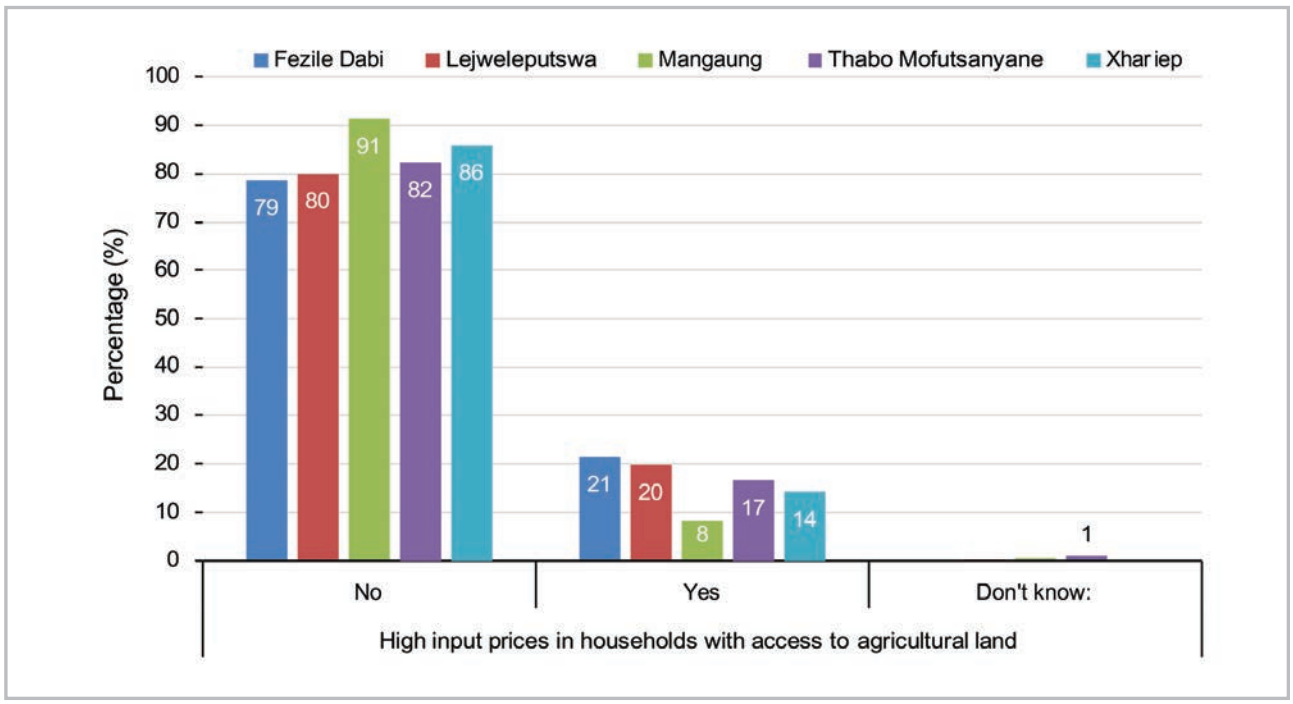


Figure 92: *Household that experience high input prices shock by district*

9.2.4 COVID-19 shocks and associated coping strategies

The COVID-19 pandemic resulted in serious disruptions in food supply chains and production systems. Mangaung District had the highest percentage (39%) of households who were sometimes worried about their food running out before they can get money to buy some more food. This followed an almost similar trend in the Thabo Mofutsanyane and Xhariep districts, where 36% of the households sometimes worried that their food would run out. In all the five districts as well, the food that they bought did not often last and at least 30% of the respondents did not have money to buy more food (Tables 66 and 67).

Table 66: Households that worried their food would run out before we got money to buy more

We worried our food would run out before we got money to buy more	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	21.0	111	18.2	112	28.7	161	18.9	117	32.7	169
Rarely	18.7	101	22.8	137	13.7	72	18.5	104	12.8	77
Sometimes	37.5	205	32.1	201	39.4	214	36.2	226	36.5	225
Often	22.9	130	26.9	170	18.2	99	26.3	158	17.9	114

Table 67: Households whose food did not last, and they did not have money to get more

The food that was bought just did not last, and they did not have money to get more	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	22.6	121	22.4	136	31.9	179	20.9	129	37.0	194
Rarely	19.4	106	19.3	117	17.4	93	17.9	102	13.6	82
Sometimes	37.2	204	32.8	206	37.5	203	35.4	218	36.0	222
Often	20.8	116	25.5	159	13.3	71	25.8	156	13.4	87

Table 68: Households who could not afford sufficient and nutritious food because the price of food increased

Households could not afford sufficient and nutritious food because the price of food increased	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	20.2	105	22.2	133	30.7	172	21.1	131	31.8	175
Rarely	20.6	115	20.4	124	16.7	93	17.8	101	17.9	96
Sometimes	37.7	207	32.1	205	36.5	195	35.0	217	35.2	217
Often	21.4	120	25.3	158	16.1	86	26.1	156	15.1	97

In all the districts, at least 35% of the households reported that they could not often afford sufficient and nutritious food because of the price increases. Across all the five districts, the respondents reported that they sometimes could not afford sufficient and nutritious foods owing to the increases in the price of food. As a result, most households were unable to eat healthy and nutritious foods, as shown in Table 69 below, where 25% of the respondents in the Lejweleputswa District reported that often they were unable to eat healthy and nutritious food.

Table 69: Households which were unable to eat healthy and nutritious food

Unable to eat healthy and nutritious food price of food increased	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	21.7	113	21.8	131	30.4	172	20.4	126	34.7	181
Rarely	22.3	125	21.5	131	18.5	101	19.0	110	16.7	101
Sometimes	35.1	192	32.6	209	34.2	184	36.3	221	33.6	207
Often	20.9	116	24.0	148	16.8	90	24.3	146	15.0	96

Table 70: Households which could not access the cheap and affordable food market, because they were shut down due national lockdown restrictions

Could not access the cheap and affordable food market, because they were shut down due to national lockdown restrictions	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	22.0	112	22.5	136	31.2	176	21.4	133	34.1	177
Rarely	26.3	142	24.7	153	16.9	94	20.6	117	18.8	114
Sometimes	39.6	224	37.8	241	39.1	208	36.0	224	34.1	210
Often	12.1	67	15.1	90	12.8	68	22.0	130	13.0	84

Most households across the districts reported that sometimes they could not access cheap and affordable food markets since they were shut down because of the COVID-19 national lockdown restrictions. However, this was mostly experienced in Thabo Mofutsanyane District (Table 70).

Table 71: Household heads who were hungry but did not eat

You were hungry but did not eat	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	47.8	252	49.0	301	52.1	293	42.0	254	52.7	287
Rarely	25.6	144	21.6	134	12.5	66	19.4	115	15.4	94
Sometimes	19.2	109	19.2	122	27.5	146	27.6	168	22.5	140
Often	7.4	41	10.2	62	7.9	40	11.0	66	9.5	61

Table 72: Household head who had to skip a meal

Had to skip a meal	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	42.2	224	40.5	248	50.3	285	39.5	242	49.6	270
Rarely	25.4	138	19.5	122	16.9	90	19.2	113	14.9	90
Sometimes	21.4	119	24.7	156	24.3	128	25.6	158	25.0	156
Often	11.1	62	15.3	93	8.4	43	15.7	92	10.5	68

Although skipping a meal was least reported across all the districts of the Free State Province, Household heads in the Lejweleputswa and Thabo Mofutsanyane districts reported that they often skipped a meal, and it was the highest percentage above (15%) compared to other districts. In Mangaung, 50% of household heads never had to skip meals. This is also attributable to the fact that these are not major food crop producing districts since they mostly rely on formal employment, in the commercial agricultural sector, mining, and tourism. Hence households would rely entirely on buying food which was limited due to restricted markets and high food prices.

Table 73: Households who ran out of food

Household ran out of food	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	44.5	240	49.4	307	52.1	294	37.1	230	52.3	285
Rarely	24.5	132	20.8	129	14.3	76	19.8	114	12.3	76
Sometimes	19.6	112	16.8	105	25.0	133	27.0	165	24.4	153
Often	11.4	63	12.9	79	8.6	44	16.0	96	11.0	70

COVID-19 was expected to increase the number of households who are food insecure in developing countries. In the Free State Province, all the districts had at least 12% of the households who reported that they rarely ran out of food, with 52% of the households in the Xhariep and Mangaung districts reported to have never run out of food.

Table 74: Household heads who went without eating for a whole day

Went without eating for a whole day	Fezile Dabi		Lejweleputswa		Mangaung		Thabo Mofutsanyane		Xhariep	
	%	N	%	N	%	N	%	N	%	N
Never	64.1	344	60.5	374	59.7	335	53.3	320	57.1	314
Rarely	18.9	107	18.5	116	11.4	60	13.5	79	11.1	69
Sometimes	11.9	67	14.1	89	22.0	115	22.5	140	22.1	137
Often	11.1	62	15.3	93	8.4	43	15.7	92	10.5	68

10 Conclusion

Food security is one of the strategic imperatives for South Africa, as outlined in many governments policy documents, including the Constitution and the national development plan. The right to have access to sufficient food by all citizens is enshrined in the Constitution of South Africa. This survey provides a baseline assessment of the food and nutrition security situation of households in the Free State Province. The findings presented in this report provided insights regarding the food and nutrition security status across the four dimensions of food and nutrition security in the province.

This survey has revealed that socio-economic challenges that include limited food production at household level, high dependencies on social grants, acute unemployment among youth and dwindling household incomes expose households to food and nutrition insecurity. Subsistence farming in rural areas of the Free State Province has been plagued by climate change and further exacerbated by the COVID-19 pandemic, which had accumulated effects on food and nutrition security.

Agriculture production systems and access to land

Overall, access to land by households in the Free State Province is extremely high (See Figure 14). Both the Lejelweputswa and Fezile Dabi districts are the two districts in the province with the highest percentage of households who have access to land, sitting at 89,7% and 86.5 %, respectively (Figure 14). The district with the least number of households accessing land is Mangaung (50%).

Households in the Free State Province were practising livestock production at an extremly lower rate compared to food and crop production. The Xhariep District is the only district with a slightly higher percentage of livestock production (39%). Both qualitative and quantitative data show that maize, beans, potatoes, and vegetables are the major crops grown in the open access livelihood zones of the province.

Household food and nutrition security indicators

The average HFIAS score for Free State was 9.2. The overall results showed that most of the households (68.4%) in the Free State Province experienced food insecurity, with only 31.6% found to be food secure. About 21.6% of the households were severely food insecure, 27.4% of the surveyed households were moderately food insecure, and 19.4% of the households were mildly food insecure.

Results of the HHS scale shows that most of the sampled households experienced little to no hunger (73.7%). About 19.1% of the households and 7.2%, respectively, experienced moderate hunger and severe hunger. While a considerable proportion of households experienced food insecurity, the HHS suggests that the level of food deprivation is not very severe for most of the households in the Free State Province.

On average, the households in Free State consumed more than 7 out of 12 food groups, which suggests above- average dietary diversity levels. In terms of the Food Consumption Score (FCS), about 37.3% of the households were consuming adequately (acceptable) diversified diets and about 37.8% of households are at the borderline, and could fall into unacceptable diversity of foods, if no actions are taken to help them improve their diets. Results further indicate that 24.9% of the households consumed poor diets. This is most concerning because more than half (62.7%) of households were not consuming acceptable diets, and this may lead to nutrition-related problems. On average, the households' food expenditure per person per month in the Free State Province was R528.74, which is below the food poverty line (Figure 67). Using the 2021 food poverty line (i.e., R624), Figure 46 shows that 73% of the households were below the food poverty line. This indicates very high levels of food poverty, which supports the results of the HFIAS results.

Individual Nutrition Indicators

Of those aged 0-11 months (n=109), 82.5% were ever breastfed, while 80.5% were breastfeeding at the time the survey was conducted. In children aged 12-24 months (n=101), 87.9% were ever breastfed, while 39.7% were being breastfed at the time the survey was conducted.

The overall prevalence of stunting for children under the age of 5 years (n=359) was 30.5%, of which 12.0% was severe and 18.5% was moderate stunting (Table 7.9 and Figure 7.3). There were no significant differences in overall stunting between age groups, gender, and districts.

The overall prevalence of underweight for children under the age of 5 years (n=366) was 10.8%, of which 4.1% was severe, and 6.7% was moderate underweight. The overall prevalence of overweight for children under the age of 5 years (n=354) was 15.0%, of which 6.1% was severe and 9.0% was moderate overweight.

The mean dietary diversity score (DDS) for children aged 0-5 years residing in the Free State (n=345) was 3.75, which is indicative of an inadequate dietary diversity (Table 7.14). District comparisons showed that Fezile Dabi District had the highest mean DDS (4.71) compared to Thabo Mofutsanyane District which had the lowest (3.11).

COVID-19 and other related shocks

The COVID-19 pandemic resulted in serious disruptions of food supply chains and production systems. The Mangaung District had the highest percentage (39%) of households who were sometimes worried about their food running out before they can get money to buy some more food. This followed an almost similar trend in the Thabo Mofutsanyane and Xhariep districts, where 36% of the households sometimes worried that their food would run out.

Over 80% households in four of the five districts reported that they have not experienced floods (Figure 73). Very few households in the province reported to have experienced flooding in the previous 12 months. Crop failure and emergence of crop diseases were barely reported across the districts. The increase in food prices was the biggest shock experienced across all the five districts in Free State Province. The highest shocks were experienced in the Fezile Daba and Lejweleputswa districts with 75% and 71%, respectively.

11 Recommendations

- Focus group discussions generally revealed a lack of young people's participation in agricultural activities. To revitalize rural economies, the government and other stakeholders need to pay attention towards attracting the youth in the agriculture sector, particularly rural youth, so that traditional land plots can be used for agricultural purposes. A sizeable number of households were involved in agricultural activities, to increase production.
- Water shortage and recurrent drought emerged as part of major shocks. This implies that there is a need for a well-thoughtout water provision programme in the Free State Province for household use and for agriculture production purposes. Possible interventions could be the construction of dams for irrigation and domestic water reticulation system at the household level.
- Promotion of projects and programmes that encourage good hygiene practices, such as the use of latrines and washing hands with soap after using the toilet, is crucial.
- Breastfeeding promotion, growth monitoring for improved case detention in children who need care, appropriate referrals, and management of acute malnutrition, coupled with appropriate messages on complementary feeding, remain key interventions that need to be done. There is a need to scale-up multiple micronutrient supplementation during pregnancy, calcium supplementation to mothers at risk of low intake, promotion of maternal balanced nutrition, use of iodised salt, deworming, and vitamin A and zinc supplementation for children under 5. Nutrition assessment of children under five at all points of contact should be strengthened. Nutrition assessment during pregnancy and appropriate management of pregnant women who are underweight or with poor weight gain should be strengthened during basic antenatal care services.
- Households need support in some months of the year (mainly January and June) to avoid negative consumption reduction practices and incidence of seasonal hunger. Interventions that seek to help households budget and save in anticipation of lumpy expenditures are crucial to ensure year-round food security.
- Enlightenment about the importance of micro- and macro-nutrient consumption as a crucial, food security programme that must be formulated to focus on the production and consumption of foods aimed at improving the identified deficient micro-nutrient at the household level. Interventions onin food preparation, meal planning and nutrition advice to support home production of fresh produce is required for improved dietary diversity in the households.
- These interventions, together with full scale implementation of other nutrition sensitive programmes and approaches such as school feeding , agriculture and food security enhancement programmes, social safety network, early childhood nutrition, women empowerment, child protection water, sanitation and hygiene, and other health and family planning services, in an enabling environment will greatly reduce morbidity and mortality in childhood, incidence of obesity and non-communicable diseases, while on the other hand contributing to the improvement of cognitive, motor socio-emotional development, school performance and learning capacity, adult stature, and work capacity and productivity.
- Nutrition assessment of children under five at all points of contact should be strengthened. More focus should be given to the first 1 000 days of a child's life. Nutrition assessment during pregnancy and appropriate management of pregnant women who are underweight or with poor weight gain should be strengthened during basic antenatal care services.

- Promotion of domestic food production: This will involve encouraging families to produce their own food to ensure food security at household level. In Free State, most families rely on food purchased from supermarkets, formal and informal traders. This is unsustainable and makes households more vulnerable to food insecurity.
- Focused investment and the establishment of food banks: Creating an enabling environment for commercial food production - There is need to increase agricultural production in each district through focused food production and agro-processing investments.
- Focus on employment creation: Targeted intervention through an agric-sector employment creation drive - A combination of high levels of unemployment and dwindling incomes means that vulnerability to food insecurity will always remain high.
- Investment in food markets and food banks: These can be distributed throughout fruit and vegetable markets that can be strategically located close to vulnerable households in all districts of the province. The markets may also serve as food banks where items imported elsewhere can be sold at affordable prices.
- Land redistribution and restitution: Most households reported limited access to land, hence there is a need for deliberate land apportionment to empower the vulnerable, especially women and the youth. Competing priorities for land pose a threat to agriculture production, considering this, the government is tasked to provide priorities of land. People seem to prefer obtaining big pieces of land and use it to build houses rather than for food production. This will increase and sustain agricultural production in rural areas of South Africa. It has the potential to allow agriculture to serve as a significant source of income for households.
- Investment in post-harvest agro processing: Although some households were found to be involved in agricultural activities now, these are not sustainable and cannot ward off household vulnerability to food insecurity. A food system that encourages and enables households to process and consume what they produce locally is needed. Households need support in some months of the year (mainly January) to avoid reduce consumption patterns and incidence of seasonal hunger. Interventions that seek to help households budget and save in anticipation of lumpy expenditures are crucial to ensure year-round food security. Awareness raising to enlighten households about the importance of dietary diversity for improved nutrition is crucial. Implementation of nutrition sensitive food security programmes by all sectors should be initiated.
- Enhancing food Safety: Informal traders and small businesses that trade in agricultural products need assistance to help them improve the quality of their services through quality assurance and extend the lifespan of their products. COVID-19 has irreversibly transformed the human perception of food and food safety. As a result, people have realized the importance of consuming safe and healthy food, not only to boost one's immune system but also to prevent the spread of diseases. As revealed in this study, people do not have equal access to safe and healthy food. For most poor people, informal traders are the main source of food. It is for this reason that a proposal to integrate food safety and quality standards in the operations of informal traders and small to medium enterprises is here being made. This will improve the quality of food items traded and increase the profits of informal traders.
- Extension Services: A focus on extension services is crucial particularly for emerging subsistence farmers. The government should strengthen its extension services program including production inputs, mechanization inputs, local market processing, and training while creating an enabling environment and upscaling the Agri-parks programme tailor made for small holder farmers.

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