Zimbabwe Vulnerability Assessment Committee (ZimVAC)

2023 URBAN LIVELIHOODS ASSESSMENT

TECHNICAL REPORT

Towards transformed livelihoods for improved food and nutrition security in urban areas.

FEBRUARY 2023

ZIMBABWE
Vulnerability
Assessment Committee

The Zimbabwe Vulnerability Assessment Committee (ZimVAC) successfully carried out the 10th Urban Livelihoods Assessment (ULA) in January 2023 under the overall coordination of the Food and Nutrition Council (FNC). This report provides updates on pertinent urban household livelihoods issues such as demographics, housing, education, health, nutrition, WASH, energy, social protection, food consumption patterns, food and income sources, income levels, expenditure patterns, coping strategies and food security.

This Urban Livelihoods Assessment placed households and their members at the centre of analysis and decision making, with the implication that household-centred analysis must play a role in developing an understanding of livelihood strategies, programmes, project planning and evaluation. The methodology used in this assessment is contextual and attempts to capture a social phenomenon within its social, economic and cultural context, whilst acknowledging the complex nature of urban livelihoods.

The 2023 ZimVAC Urban Livelihoods Assessment (ULA) was conducted during a period characterised by the implementation of several programmes and initiatives to help communities build back stronger after the ravaging effects of a catastrophic natural disaster (Cyclone Idai) and a health pandemic (COVID-19). The double tragedy of 2019, i.e., the destruction caused by Cyclone Idai and the impact of COVID-19 affected all sectors of the country; social, economic, health, education, food security, infrastructure etc. More so, the impact of these disasters exacerbated the effect of the increased frequency of droughts in some parts of the country.

We continue to express our gratitude to ZimVAC stakeholders for undertaking the assessment, with tremendous support from the food and nutrition security structures at both provincial and district levels. The assessment received financial support and technical leadership from the Government of Zimbabwe and its Development Partners. Without this support, the 2023 Urban Livelihoods Assessment would not have been successful. We would like to appreciate the urban communities of Zimbabwe as well as the local authorities for cooperating and supporting this assessment.

We submit this report to you for your use and reference in your invaluable work. We hope it will light your way as you search for lasting measures in addressing priority issues keeping many of our urban households vulnerable to food and nutrition insecurity.

George D. Kembo (Dr.)
FNC Director General / ZimVAC Chairperson

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Executive Summary

The Zimbabwe Vulnerability Assessment Committee (ZimVAC) successfully carried out the 10th Urban Livelihoods Assessment (ULA) in January 2023 under the overall coordination of the Food and Nutrition Council (FNC). ZimVAC is a Government led consortium of Ministries, United Nations (UN) agencies, Non-Governmental Organisations (NGOs), other international organisations and Academia established in 2002 as part of the Southern Africa Development Community (SADC)'s Vulnerability Assessment and Analysis (VAA) system. ZimVAC regularly contributes towards updating Government and its Development Partners on the food and nutrition security situation through baselines, assessments and monitoring exercises, complementing other information sources such as the Ministry of Agriculture's Crop and Livestock Assessments, ZimSTAT's Zimbabwe Demographic and Health Survey (ZDHS), Poverty Income, Consumption and Expenditure Survey (PICES) and Multiple Indicator Cluster Survey (MICS).

ZimVAC is chaired by the Food and Nutrition Council (FNC), a Department in the Office of the President and Cabinet. The Government of Zimbabwe has put mechanisms to ensure the effective institutionalization of ZimVAC by providing personnel within the FNC to run the operations of ZimVAC. This has been further supported by coming up with the legal structures that govern the work of ZimVAC. In the Food and Nutrition Security Policy, ZimVAC has a role to play in fulfilling Commitment Six in which the "*Government of Zimbabwe is committed to ensuring a national integrated food and nutrition security information system that provides timely and reliable information on the food and nutrition security situation and the effectiveness of programmes and informs decision-making.*" Of most relevance is the Government's commitment to a food and nutrition security information system, including assessment, analysis and early warning (Commitment VI). The Policy identifies FNC as the lead agency for this commitment. It also recognizes ZimVAC as a critical mechanism to fulfil this commitment. The Policy also describes the institutional framework within which ZimVAC is situated.

This technical report provides updates on pertinent urban household livelihoods issues such as demographics, housing, education, health, nutrition, WASH, energy, social protection, food consumption patterns, food and income sources, income levels, expenditure patterns, debts, coping strategies, and food security. The assessment results will be used to guide the following:

i. Evidence based planning and programming for targeted interventions.

ii. Development of interventions that address immediate to long term needs as well as building resilient livelihoods.
iii. Early warning for early action.
iv. Monitoring and reporting progress towards commitments within the guiding frameworks of existing national and international food and nutrition policies and strategies such as the National Development Strategy 1, the Food and Nutrition Security Policy, SDGs and the Zero Hunger strategy.

Objective of the 2023 Urban Livelihoods Assessment (ULA)

The overall objective of the ULA was to provide an annual update on livelihoods in Zimbabwe's urban areas, for the purposes of informing policy formulation and programming appropriate interventions.

The specific objectives of the assessment were to:

i. Estimate the urban population that is likely to be food insecure in 2023, their geographic distribution and the severity of their food insecurity.
ii. Assess the nutrition status of children of 6 – 59 months and 5 to 19 years age groups.
iii. Describe the socio-economic profiles of and urban households in terms of such characteristics as their demographics, access to basic services (education, health services, protection services and water, sanitation and hygiene services), assets, income sources, urban agriculture, incomes and expenditure patterns, food consumption patterns and consumption coping strategies.
iv. Determine the coverage of humanitarian and developmental interventions.

Context of the 2023 Urban Livelihoods Assessment

The 2023 ZimVAC Urban Livelihoods Assessment (ULA) was conducted during a period characterised by the implementation of several programmes and initiatives to help communities build back stronger after the ravaging effects of the climate change induced natural disaster, Cyclone Idai, and a health pandemic, COVID-19. This double tragedy of 2019 affected all sectors of the country; social, economic, health, education, food security, infrastructure etc. The impacts of these disasters are still being felt three years after they occurred. More so, the impact of these disasters exacerbated the effect of the increased frequency of droughts in some parts of the country. The war in Ukraine has not made the situation any better as the country is being impacted by the ripple effects of the war.

Besides the immediate suffering and loss of human lives and destruction of infrastructure caused by the Cyclone Idai and COVID-19 pandemic, the disasters exposed several key vulnerabilities of our societies and economic system. For example, the social inequalities were exposed and rapidly exacerbated by the massive but uneven loss of employment due to restriction measures against COVID-19. To address these gaps, the Government of Zimbabwe (GoZ) engaged in a rebuilding mode where recovery, rehabilitation and reconstruction are taking place to increase the resilience of both rural and urban households and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment. In alignment to the National Development Strategy 1, all the policies and programmes being implemented by the GoZ are aimed at creating an enabling environment to help build resilience in urban areas and also to achieve the set targets for becoming a "Prosperous & Empowered Upper Middle-Income Society by 2030". Basically, the policies and programmes are aimed at getting the economy and livelihoods quickly back on their feet. In addition, the policies and programmes are meant to trigger investment and behavioural changes that will reduce the likelihood of future shocks and increase society's resilience to them when they do occur.

The findings from the ZimVAC 2023 ULA will therefore provide evidence and information on the food and nutrition status of the urban households in the aftermath of the impact of COVID-19 and Cyclone Idai. Furthermore, the findings contained in this report will enable evidence-based programming, policies and decision making and also help to track the impact of the various policies and programmes being implemented by the Government in the thrust to *build back stronger* and to increase the resilience of urban households.

Findings

i. Background characteristics of the surveyed population

- Nationally, more women (55.7%) were sampled for the survey as compared to men (44.3%). Matabeleland South province (58.1%) had the highest proportion of women that were sampled for the survey and the lowest was recorded in Mashonaland East province (53.9%).
- Mashonaland East (13.9%) and Harare (13.9%) provinces had the highest proportion of the surveyed population within the 0-4 age group, the highest proportion in the 5-9 years age group was in Mashonaland Central (11.4%), and the highest proportion in the 10-19 years age group was recorded in Mashonaland West province (19.4%).

- The average household size was 4.5 and the average age of household head was 43.4 years.

ii. Background characteristics of household heads

- At least 64.4% of the households were male headed and 35.6% were female headed.
- Disaggregating the data by province, Bulawayo province had the highest proportion of households headed by females (44.6%), elderly persons (24.2%) and also had the highest average age of household head (47.6 years).
- A greater proportion of the household heads was employed, with 36.9% informally employed and 24.1% formally employed. Combining the formally and informally employed, the results show that at least 61% of the household heads had a source of income.
- The results show that the country has made significant strides in achieving universal primary education as at least 97.8% of the household heads had completed primary education.

iii. Water, Sanitation and Hygiene (WASH)

- Using the Sustainable Development Goals (SDG) criteria for provision of water services, the national average was at 48.4% for basic water services and 49.1% for limited services meaning in terms of water quality, 97.5% of the sampled households had access to water from an improved water source[1]. The Government of Zimbabwe is applauded for this positive outcome.
- Bulawayo province recorded the highest proportion of households with basic water services (86%) and Harare had the highest proportion of households with unimproved water services (5%).
- Bulawayo province (65%) had the highest proportion of households with basic sanitation facilities whilst the proportion of households still practising open defecation was highest in Matabeleland South (9.9%).
- At the 1% level of significance, female headed households were 4.78% more likely to have a handwashing station and 4.31% increased chance of having handwashing soap at the station.
- At the 1% level of significance, households with a chronically ill household head were 6.63% less likely to have soap at the handwashing station *ceteris paribus*.

[1] Drinking water from an unprotected dug well or unprotected spring

- Religion of household head had a significant role on hygiene and sanitation practices with Pentecostal and Apostolic sect less likely to have a handwashing station with soap.
- More so, at 1% significance level, a household headed by a member of the apostolic sect was 1.62 % more likely to resort to open defecation, *ceteris paribus*.
- At the 1% level of significance, a female headed household was 3.18% less likely to have a protected well as compared to male headed households, *ceteris paribus*.

iv. Main source and form of energy

- Nationally, 50.7% of sampled urban households used electricity as the main source of cooking energy, followed by wood fuel (21.5%) and Liquefied Petroleum Gas (LPG) (20.2%).
- Only 3% of sampled households in Harare South and 6% in Epworth indicated that they use electricity as the main source of cooking energy.
- However, the main energy source of energy used for cooking was not always available. Only 31.2% of households indicated that the main energy source for cooking was always available.
- For lighting, most households (62.8%) indicated that they mainly used electricity and solar (14.6%) and candles (11%) were the second and third mostly used main sources of lighting.
- The results indicated that, *ceteris paribus*, larger households had a 1.76% reduced probability of using electricity as the main source of cooking, at the 1% level of significance.
- Households with a chronically ill head had a 3.92% increased propensity to used wood fuel as the main source of cooking energy at the 1% level of significance.
- Bulawayo (46.9%), Mashonaland West (17.7%) and Midlands (13.6%) provinces were more likely to use electricity than the base province of Masvingo.

v. Urban Agriculture

- The results show that urban agriculture was popular with urban households as 22.2% of the surveyed households were practising urban agriculture.
- Households that were practising urban agriculture had the following characteristics: female headed, low income earning, household head was chronically ill, and large household size.

- At province level, urban agriculture was more popular in Mashonaland East (46.6%) and Matabeleland South (2.3%) had the least proportion of households that were practising urban agriculture.
- The most practised form of agriculture was crop/horticulture production (20.2%), followed by mixed agriculture (crop/horticulture and livestock production) (1.3%) and then livestock production (0.5%).
- Crop/horticulture production was most common in Mashonaland East province (43.9%) and least popular in Matabeleland South (1.73%). Livestock production was very limited across all provinces.
- The most grown crop by urban households was maize (47.3%) followed by leafy vegetables (28.8%) and yams (0.3%) were the least grown.
- Maize production was most popular in Mashonaland Central province (80.6%) and production of leafy vegetables was most common in Matabeleland North province (65.6%).
- The diversity of crops grown by urban households, i.e., cereal grain, tubers, leafy vegetables, and bulbs, is a positive result as it can contribute towards improved diets for urban households. It is interesting to note that in some urban areas such as Matabeleland South, wheat (5.3%) is the commonly grown crop.
- The results show evidence of the support to urban agriculture provided by the Government of Zimbabwe. At national level, the most common form of agricultural support was the provision of free seed (48%), followed by Compound D fertiliser (32.8%), then Ammonium Nitrate fertiliser (18.2%) and lastly, pesticides (1%).
- Matabeleland North received the most support in terms of seed (75%) and pesticides (8%).
- Surveyed households in Midlands received the highest support in terms of Compound D (38.6%) and Mashonaland Central (26.5%) received the highest support in terms of (Ammonium Nitrate).
- These results show Government's commitment to ensuring food security to all households in Zimbabwe. In line with NDS1, the Government has made it a policy to support urban agriculture as the Government is "*leaving no one and no place behind*" in transforming Zimbabwe into an Upper Middle-Income Economy.
- Besides the provision of agricultural inputs, the Government has also created a conducive environment for urban agriculture through implementation of policies that promote and safeguard urban agriculture.

- Although urban agriculture is gaining momentum, there as some few barriers impeding its success. The main barrier highlighted by the surveyed households was lack of access to land (71.7%) followed by lack of interest (7.5%).

vi. Child and Adolescent Nutrition Status and Diet Quality

- For children 6 to 59 months, the results revealed high stunting prevalence of 23%, underweight was at 6.9%, wasting 2.9% and obesity 0.1%. Stunting was higher in boys (25.0%) than girls (21.0%), even underweight prevalence was also higher in boys (7.7%) than girls (6.1%). Conversely, wasting was higher in girls (3.1%) than boys (2.8%).
- The results for children 5 to 9 years indicated stunting prevalence of 10.0% and underweight was at 10.5%. Stunting was marginally higher in boys (10.7%) than girls (9.2%), even underweight prevalence was also higher in boys (11.1%) than girls (9.8%).
- For adolescents (10-19 years), the results revealed stunting prevalence of 13.9% and underweight (9.6%). Stunting prevalence for males (17.5%) was marginally higher than that of females (11.0%). Similarly, underweight was high in males (12.2%) compared to females (7.6%).

vii. Incidence and Severity of Shocks and Stressors

- The results revealed that shocks experienced by urban households are almost exclusively in the economic sphere. Across all the provinces at least 80% of the households indicated that they had experienced a sharp rise in the prices of basic commodities.
- Nationally, urban households were engaging in food-based coping strategies which may compromise their nutrition status.
- Manicaland, Mashonaland West and Harare reported high coping strategies of 52%, 45% and 40%, respectively. Urban households in Mashonaland Central (60%), Mashonaland East (53%) and Matabeleland South (52%) reported no or low coping.

Livelihoods based Coping Strategy Index

- About 69% of the urban households were not engaging in livelihoods coping strategies as only 31% were employing livelihoods coping strategies.
- The highest proportion of urban households engaging in emergency coping strategies was reported in Harare South (34%) and Redcliffe (33%).

Reduced Coping Strategy Index (rCSI)

- Female headed households had a reduced likelihood of engaging in reduced coping strategies at the 1% level of significance.
- Households with household heads suffering from a chronic condition had a reduced likelihood of engaging in reduced coping strategies at 1%. These are usually the targeted households for most Government and non-Government support.

Livelihoods-based Coping Strategy index (LCSI)

- Households with the following characteristics of household head had a higher propensity to engage in livelihoods coping strategies:
  - Headed by those married living apart, never married, not disabled household heads.
  - Households with low monthly income had higher propensity to engage in livelihoods coping strategies.
  - Large size households had an increased likelihood to engage in livelihood coping strategies.

viii. Social Protection

- At least 26.2% of sampled households received some kind of support.
- Relatives (11%) emerged as the most common source of support followed by Government (9.2%) and remittances (6.7%).
- Support from relatives was most prominent in Mashonaland East (15.9%) and Mashonaland West (14.9%).
- For Government support, households in Mashonaland Central (28.1%) received the highest support followed by Mashonaland East (17.7%) and Manicaland (15.7%).
- Remittances from outside the country mostly supported households in Bulawayo (10.4%) followed by those in Mashonaland East (6.9%), Mashonaland West and Matabeleland South both 6.7%.
- At the 1% level of significance and *ceteris paribus*, increasing the age of household head by one year increased the inclination of the household to receive social support from Government by 0.24%.
- Widowhood increased one's chances of getting Government social support by 0.38%.
- Larger households were 0.66% more likely to receive social support than smaller ones.
- Regarding receiving support from UN/NGOs, households headed by older persons had an increased chance of receiving social protection support from the UN/NGOs.
- Households headed by a chronically ill head had a 0.22% increased likelihood of getting support from UN/NGOs.

ix. Cereal Insecurity

- The results revealed that 29.1% of the sampled urban households were food insecure.
- The characteristics of these cereal insecure households were as follows:
  - Female headed households were marginally statistically associated with cereal insecurity, all things being equal.
  - *Ceteris paribus*, increasing the age of the household head by one year was associated with a decrease in the probability of the household being cereal insecure by 0.82%, at the 5% level of significance.
  - Disability or chronic conditions on the part of the household head was associated with an increased chance of the household being food insecure, *ceteris paribus*.
  - More so, large size households were associated with an increased probability of the household being food insecure.

x. Treatment Effects

- The interlinkage between selected variables (Government social support, UN/NGO support, and urban agriculture) and food and nutrition security variables revealed that *ceteris paribus,* Government support was associated with an increase in the household dietary diversity score, consumption of vitamin A or iron rich foods at the 1% level of significance.
- There was a statistically significant positive association of UN/NGO support with increased food insecurity in urban setting.
- Expectedly, since one would not expect urban agriculture to increase incomes but rather consumption, urban agriculture was not statistically associated with cereal insecurity (which is income based) but it was associated with a decrease in consumption or livelihoods coping, all things being equal.
- All things being equal, the possession of a handwashing station was marginally (10% level of significance) associated with a decrease in the decline in the incidences of diarrheal diseases. The failure to associate the improvements in the WASH outcomes could very likely be associated with the violation of the Stable Unit Treatment Value Assumption which would imply the incidences of spillovers.[2]

Recommendations

[2]Angrist, 1996). DOI: 10.1080/01621459.1996.10476902

Based on the findings from the 2023 Urban Livelihoods Assessment presented in this report, the following recommendations are put forward.

1. **Leverage on urban food systems to improve the food and nutrition security status of urban households.**
   i. The Government is commended for its efforts to improve food and nutrition security of the urban population through the implementation of programmes supporting urban agriculture. However, where policy allows, there is need to expand agricultural support for urban agriculture to improve the urban poor's consumption of a diversity of nutritious food, such as fruits and vegetables;
   ii. The findings from the assessment revealed that urban agriculture is not being impactful when one considers the income effect as evidenced by insignificant effect on cereal insecurity (which is based on income) but rather it is having an impact through availability. It is therefore important to boost the income effect so that it influences cereal security and this can be done through increasing access to markets or removing impediments to urban agriculture; and
   iii. Strengthen urban-rural linkages and support value chains for perishable, high-value nutritious foods (including fruits and vegetables, dairy, poultry, and fish) to boost consumption of these foods by the urban population and improve on the diet quality of the urban households.

2. **Strengthen social safety nets to support the livelihoods, income, food security, and healthy diets of urban households and build resilience against seasonality, climate, health, and other shocks and vulnerabilities.**
   i. Providing targeted cash, food transfers, or vouchers for nutritious foods to poor urban households and strengthening food-based safety nets for the low-income earning and food insecure households which are vulnerable to critical levels of food deficit. Integration of safety nets within broader social protection strategies enables a more cohesive relief and development approach, as opposed to a relief to development continuum or more linear approach;
   ii. UN/NGO support which is mostly cash based has statistically significant positive association with food insecurity implying that the leisure/work effect might be at play. It is therefore recommended that aid such as cash transfers to be in-kind or in terms of something that could be used for productive purposes; and
   iii. Extending the school feeding programmes to all urban areas, especially in high density areas, and provide free healthy school meals and educating school children

on healthy diets and lifestyles. This is important given the fact that 23% of the children under 5 years were stunted, 6.9% were underweight, 2.9% were wasted and only 5.8% of the children were getting an adequate diet.

3. **Improving availability and quality of electricity and other alternative sources of energy.**
   i. Given that most respondents pointed out that their main energy sources were not always available, there is need for Government to intensity efforts to improve energy supply in the country through a raft of measures which amongst others could include use of fiscal instruments to promote investment in and use of renewable energy.
   ii. More so, there is need for Government to consider improving the electricity subsidy regime to ensure that the cost of electricity allows the extremely poor households to access enough electricity to cover their basic needs. This can be done by, for instance, widening the first band in the stepped tariff system used by ZESA.
   iii. In view of the gaps in knowledge on the interactions of energy and food and nutrition security in Zimbabwe, there is need to commission research on the same to inform policy and programming.

1. Background

The Zimbabwe Vulnerably Assessment Committee (ZimVAC) is a Government led consortium of Ministries, United Nations (UN) agencies, Non-Governmental Organisations (NGOs), other international organisations and Academia established in 2002 as part of the Southern Africa Development Community (SADC)'s Vulnerability Assessment and Analysis (VAA) system. ZimVAC regularly contributes towards updating Government and its Development Partners on the food and nutrition security situation through baseline assessments and monitoring exercises, complementing other information sources such as the Ministry of Agriculture's Crop and Livestock Assessments, ZimSTAT's Zimbabwe Demographic and Health Survey (ZDHS), Poverty Income, Consumption and Expenditure Survey (PICES) and Multiple Indicator Cluster Survey (MICS).

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Since its inception, ZimVAC has undertaken Annual Livelihoods Assessments. The reports have an important role in guiding resource allocation for the vulnerable population, planning of national programmes and have emerged as a guiding document for responding to livelihoods challenges. The rural and urban livelihoods assessments are therefore part of a comprehensive food and nutrition security information system which informs Government and its Development Partners on programming necessary for saving lives and strengthening livelihoods in Zimbabwe.

1.1 Objective of the 2023 Urban Livelihoods Assessment (ULA)

The overall objective of the ULA was to provide an annual update on livelihoods in Zimbabwe's urban areas, for the purposes of informing policy formulation and programming appropriate interventions.

The specific objectives of the assessment were to:

i. Estimate the urban population that is likely to be food insecure in 2023, their geographic distribution and the severity of their food insecurity.
ii. Assess the nutrition status of children of 6 – 59 months and 5 to 19 years age groups.
iii. Describe the socio-economic profiles of urban households in terms of such characteristics as their demographics, access to basic services (education, health services, water, sanitation and hygiene services), assets, income sources, urban agriculture, incomes and expenditure patterns, food consumption patterns and consumption coping strategies.
iv. Determine the coverage of humanitarian and developmental interventions.

1.2 Understanding Food and Nutrition Security

Food and nutrition security is one of the cornerstones and key indicator of a nation's development. Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life[3]. At a global perspective, the challenges to ending hunger, food insecurity and all forms of malnutrition keep growing in both rural and urban areas. The aftermath effects of the COVID-19 pandemic have further highlighted the fragilities in agrifood systems and the inequalities across societies, driving further increases in world hunger and severe food insecurity. Despite global progress, trends in child undernutrition – including stunting and wasting, deficiencies in essential micronutrients and overweight and obesity in children, continue to be of great concern. The most recent evidence available suggests that the number of people unable to afford a healthy diet around the world rose by 112 million to almost 3.1 billion, reflecting the impacts of rising consumer food prices during the pandemic[4].

Urbanisation is, without doubt, one of the twenty-first century's most transformative trends, marked by a relentless increase in the absolute numbers of urban population, an expansion of the built environment, and the changing of norms, cultures and lifestyles.

[3] World Food Summit (1996)

[4] State of Food Security and Nutrition in the World Report (2022).

People continue to seek economic and personal development opportunities in urban centres, and most of the global population now lives in urban areas. It's therefore not surprising that urbanisation itself brings about considerable sustainability challenges in many key areas including food security. As people move to towns in search of better opportunities, accelerating urbanisation brings new challenges. More people in urban areas mean that more food, more goods, more services and more employment opportunities must be provided.

In most developing countries, food insecurity and malnutrition are increasingly becoming urban problems. Persistent child undernutrition, micronutrient deficiencies, and an alarming rise in overweight and obesity in urban areas mark the shift of the burden of malnutrition from rural areas to urban areas[5]. Usually, dependence on purchased food and employment in the informal sector leave the urban population vulnerable to income and food price shocks. Formal and informal safety nets often fail to protect the low-income earners in urban areas. In addition, limited access to healthcare, safe water, and sanitation in cities leads to severe health and nutrition inequalities for the urban low-income earning households.

In addition, the urban population is being exposed and put under pressure from non-climate stressors (e.g., population and income growth) and from climate change. Climate change has direct impacts on food systems and food and nutrition security of a nation. The climate stresses are impacting the four pillars of food security (availability, access, utilisation, and stability). Observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events[6].

Urban dwellers' reliance on urban services adversely affects them if the services are not provided due to occurrence of shocks and stressors. This challenges the capacity of local authorities and city-practitioners to deliver, and for the cities to protect and provide for people. For adaptation and mitigation against the increased exposure to climate stressors, there is need to institute enabling conditions to help build resilience amongst the urban population. At the heart of the urban resilience approach there is the need to ensure that cities not only survive shocks and stresses but enable people to build resilience to future shocks and stresses. Ultimately, cities are resilient when people living and working there

[5] IFPRI (2017). Food Security and Nutrition: Growing Cities, New Challenges. http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/131088/filename/131299.pdf

[6] FAO (2018) The Future of Food and Agriculture: Alternative Pathways to 2050. Food and Agriculture Organization of the United Nations, Rome, Italy, 228 pp.

are resilient. Cities that merely survive often do so at the expense of people's safety, dignity, health and wellbeing[7].

Resilience is regularly defined as the ability of systems to absorb, adapt and transform when facing disturbances, remain functional and, if possible, continue to develop[8]. This definition emphasises the ability of urban systems to absorb the negative effects of disturbances (through effective preparedness, response and recovery), adapt (by making incremental changes required in the short to mid-term in anticipation or recognising the extent, recurrence and magnitude of disturbances), but also, to transform in order to respond to disturbances effectively[9].

1.3 Context of the 2023 ZimVAC Urban Livelihoods Assessment

The 2023 ZimVAC Urban Livelihoods Assessment (ULA) was conducted during a period characterised the implementation of several programmes and initiatives to help communities build back stronger after the ravaging effects of natural disasters (Cyclone Idai) and a health pandemic (COVID-19). The double tragedy of 2019, i.e., the destruction caused by Cyclone Idai and the impact of COVID-19 affected all sectors of the country; social, economic, health, education, food security, infrastructure etc. The impacts of these disasters are still being felt three years after the disasters occurred. More so, the impact of the disasters exacerbated the effect of the increased frequency of droughts in some parts of the country. The war in Ukraine has not made the situation any better and the country is being impacted by the ripple effects of the war.

Besides the immediate suffering and loss of human lives and destruction to infrastructure caused by the Cyclone Idai and the COVID-19 pandemic, the disasters exposed several key vulnerabilities of our societies and economic system. For example, the social inequalities were exposed and rapidly exacerbated by the massive but uneven loss of employment due to restriction measures against COVID-19. To address these gaps, the Government of Zimbabwe (GoZ) engaged in a rebuilding mode where recovery, rehabilitation and reconstruction are taking place to increase the resilience of both rural and urban households and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalisation of livelihoods,

[7] UNDP and UNICEF (2019). Roadmap for Building Urban Resilience in Zimbabwe. file:///C:/Users/HP/Downloads/UNDP_ZW_URR.pdf

[8] Folke et al (2010). Ecology and Society, Vol. 15, No. 4

[9] Amaratunga et al. (2019). Reducing risks and building resilience at the local level: A global review of local DRR strategies. Global Assessment Report on Disaster Risk Reduction (GAR 2019), 1-19.

economies and the environment. In alignment to the National Development Strategy 1, all the policies and programmes being implemented by the GoZ are aimed at creating an enabling environment to help build resilience in urban areas and also to achieve the set targets for becoming a "Prosperous & Empowered Upper Middle-Income Society by 2030". Basically, the policies and programmes are aimed at getting the economy and livelihoods quickly back on their feet. In addition, the policies and programmes are meant to trigger investment and behavioural changes that will reduce the likelihood of future shocks and increase society's resilience to them when they do occur.

In an effort to improve the food and nutrition security status of urban households, the GoZ is supporting urban agriculture, through the Presidential Input Scheme, with the aim to build resilient and sustainable food systems in urban areas. Other programmes being implemented by the Government include social protection of the vulnerable communities in urban areas and the urban roads rehabilitation programme, among several other initiatives.

2. Methodology

The assessment was a cross-sectional study whose design was guided and informed by the Food and Nutrition Security Conceptual framework (Figure 1) which Zimbabwe adopted in the FNSP (GoZ, 2012), and the conceptual framework on food security dimensions propounded by Jones et al. (2013). The assessment considered food availability and access as pillars that have confounding effects on food security as defined in the FNSP (GoZ, 2012). Accordingly, the assessment measured the amount of food energy available to a household from all its potential sources, hence the primary sampling unit for the assessment was the household.

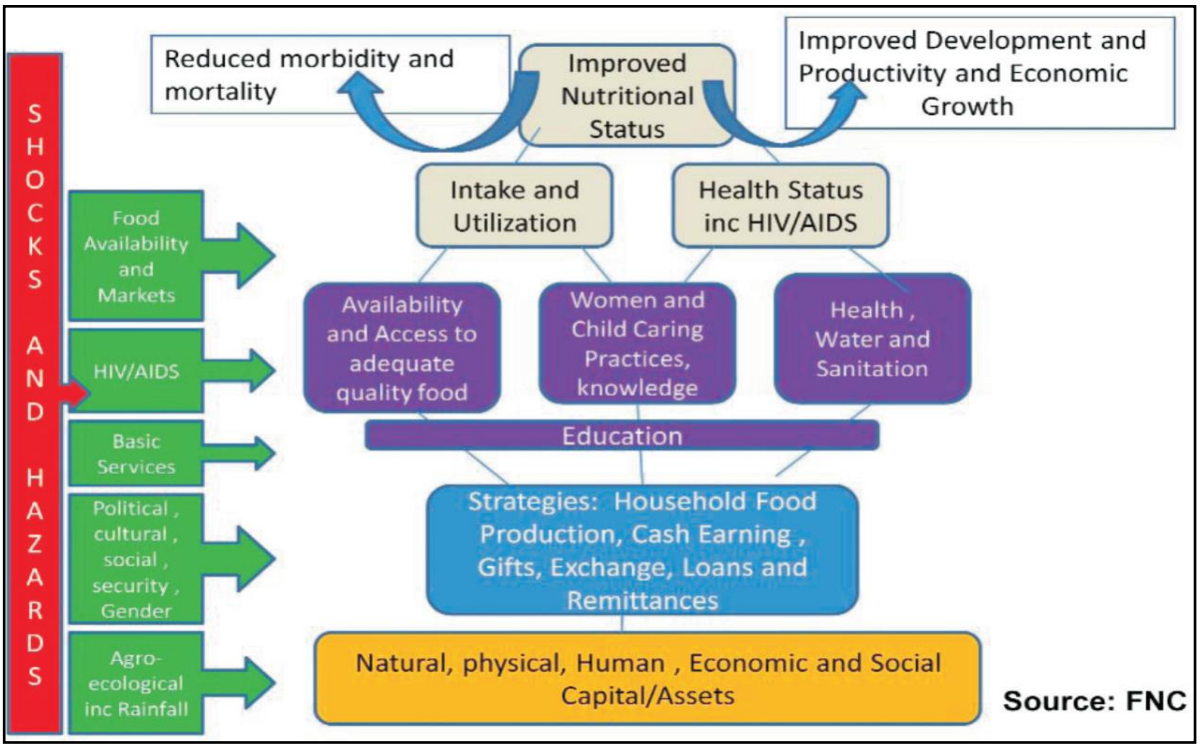

Figure 1: *The Food and Nutrition Security Conceptual Framework*

2.1 Assessment Design

The assessment design concept and the data collection tools were developed based on multi-stakeholder engagement and the assessment objectives. The primary data collection tool used was an Android-based structured household tool. ZimVAC supervisors and enumerators were recruited from Government, United Nations, Technical partners and Non-Governmental Organisations. The supervisors and enumerators underwent a 2-day training (23 to 24 January 2023) on all aspects of the assessment. Primary data collection took place from 25 January to 10 February 2023 and data analysis and report writing ran from 15 to 23 February 2023. Various secondary data sources and field observations were used to contextualise the analysis and reporting.

The Ministry of Health and Child Care was the lead ministry in the development of the Infection, Prevention and Control (IPC) guidelines for the assessment. The guidelines were used to train all enumerators and supervisors on how to practice IPC measures during the whole assessment process. The Ministry of Local Government, through the Provincial Development Coordinators' offices coordinated the recruitment of domain level enumerators and mobilisation of provincial and district enumeration vehicles. Enumerators for the assessment were drawn from an already existing database of those who participated in one or two previous ZimVAC assessments. Three enumerators and one anthropometrist were selected from each domain for data collection.

2.2 Sampling design

The sampling design was such that key livelihood indicators, particularly food insecurity prevalence, could be reported at domain level with at least 95% confidence. Samples were drawn from 50 reporting domains made up of cities, towns, service centres and growth points **(Table 1)**. The focus was on urban households residing in the medium-density, high density, and peri-urban areas of Zimbabwe. Urban Council Areas (UCAs), Administrative Centers (ACs), Growth Points (GPs) and Other Urban Areas were considered in the sampling design. The 2022 ZimSTAT master sampling frame was used to draw 25 enumeration areas (EAs) for each domain using Probability Proportional to Population Size (PPS) method. For domains in Harare and Bulawayo, 30 enumeration areas were sampled in each domain.

2.3 Data analysis

The households enumerated were selected using systematic random sampling within the sampled EAs. Primary data was transcribed using CSEntry and CSPro, then consolidated, converted and analysed using SPSS, STATA, ENA, Microsoft Excel and GIS packages for household structured interviews. The data was analysed for the following thematic areas / modules:

i. Education
ii. Health
iii. WASH
iv. Housing and Energy
v. Transport and Communication
vi. Nutrition
vii. Agriculture and other urban livelihoods activities
viii. Food Security
ix. Shocks and stressors
x. Social Protection
xi. Gender Based Violence
xii. Linkages amongst the key sectoral and thematic areas
xiii. Cross-cutting issues such as gender, disability

xiv. Youth

***Table 1**: Enumeration and domain areas sampled*

Province	Domain
Harare	1. Harare South (Hopley, Southlea, Ushewokunze) 2. Greater Harare 1 (Mbare - Sunningdale) 3. Greater Harare 2 (GlenView, Glenorah - Budiriro, Mufakose, Highfields) 4. Greater Harare 3 (Tafara - Mabvuku) 5. Greater Harare 4 (Kuwadzana, Warren Park, Dzivarasekwa) 6. Epworth 7. Chitungwiza (Seke) 8. Chitungwiza (Zengeza) 9. Chitungwiza (St Mary's, Manyame) 10. Caledonia 11. Hatcliffe
Bulawayo	12. Bulawayo North (Makokoba, Nguboyenja, Thorngrove) 13. Emakhandeni (Emakhandeni, Mpopoma, Entumbane, Matshobana, Pelandaba, Njube, Old Lobengula, Lobengula Extension) 14. Luveve (Luveve, Gwabalanda, Cowdry Park, Enqameni) 15. Magwegwe-Pumula (Pumula, Magwegwe, Hyde Park, Pelandaba West) 16. Lobengula (Lobengula (all except Extension and Old) 17. Nketa-Emganwini (Nketa, Emganwini, Rangemore) 18. Nkulumane-Tshabalala-Sizinda
Manicaland	19. Mutare Urban 20. Rusape 21. Chipinge-Chimanimani
Mashonaland Central	22. Bindura Urban 23. Mazowe-Mvurwi 24. Mt. Darwin-Shamva
Mashonaland East	25. Marondera Urban 26. Murehwa-Mutoko-Mudzi 27. Chivhu 28. Ruwa-Domboshava-Goromonzi
Mashonaland West	29. Kadoma 30. Chegutu 31. Chinhoyi 32. Kariba-Karoi 33. Norton
Matabeleland North	34. Victoria Falls 35. Hwange 36. Binga-Lupane
Matabeleland South	37. Beitbridge Urban 38. Gwanda Urban 39. Plumtree
Midlands	40. Gweru Urban 41. Kwekwe Urban 42. Redcliff 43. Mvuma - Lalapansi 44. Zvishavane Urban 45. Gokwe Centre, Nembudziya

Masvingo	46. Masvingo Urban 47. Gutu- Bikita 48. Zaka-Jerera 49. Chiredzi Urban 50. Rutenga-Neshuro-Ngundu

2.4 Evaluation of Treatment Effects

Assessing the treatments effects of various measures on outcome variables of interest such as food security status of the household using the 2023 Urban Livelihoods Assessment data (see Section 10) is confounded by incomplete information arising from the self-selection of observations into treatment.[10],[11],[12] Propensity Score Matching (PSM) is used to reduce the confounding effects of observational survey data as observational or non-randomised studies suffer from selection bias unlike randomised control trials (RCTs).

We define an indicator variable, T_i, which takes the value of 1 for household i, if the household was treated and 0, otherwise. We also define the outcome variable such as food security of the household as Y_i. The counterfactual problem is that for each household we can only observe either Y_{i0}, or Y_{i1} when $T_i = 1$ and $T_i = 0$, respectively.

Propensity Score Matching techniques circumvent the counterfactual problem by matching $T_i = 1$ and $T_i = 0$ households using Pr ($T_i = 1 | X$) which is the probability of household i having $T_i = 1$ on the basis of observed covariates, $\mathbf{X_i}$. In this report, we use nearest neighbour matching technique which chooses an individual from the comparison group for treated individual that is closest in terms of propensity score. We estimate the average treatment effect on the treated (ATT) that provides the impact of treatment on outcome variables as follows:

$$ATT = E(Y_{i1} \mid T_i = 1) - E\{E\,(Y_{i0} \mid T_i = 0, \Pr\,(T_i = 1|X) \mid T_i = 1)\} \qquad [2]$$

The validity of the ATT requires the conditional independence assumption that assignment to $T_i = 1$ or $T_i = 0$ is random after controlling for observed covariates X. [13], [14],[15] To examine

[10] Austin, P. C. (2011) "An introduction to propensity score methods for reducing the effects of confounding in observational studies", Multivariate Behavioral Research, 46(3), 399–424. https://doi.org/10.1080/00273171.2011.568786
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[14] Banerjee, A. V., & Duflo, E. (2011). Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty. New York: Perseus Books.
[15] Huang, J., Oshima, K., & Kim, Y. (2010) "Does food insecurity affect parental characteristics and child behavior? Testing mediation effects." Soc Serv Rev, 84, 381–401. https://doi.org/10.1086/655821

treatment heterogeneity in the impact of T_i= 1 on the basis of a heterogenic factor such as G_i, which could be whether the household was affected by a shock or not, we separately estimate Average Treatment Effects on the Treated (ATT) from Equation 2.

3. Assessment Findings

3.1 Sample size

A total of 13,421 households were sampled and of these, 99.7% (13,384) accepted to be interviewed and 0.3% (37) refused (Table 2). As such, data was successfully collected from the 13,384 households interviewed. Harare province (3,320) had the highest number of surveyed households and Mashonaland Central province (726) had the least.

Table 2: *Sampled population per province*

Province	Interviewed	(%)	Refused	(%)	Total sampled
Bulawayo	2092	99.3	14	0.7	2106
Manicaland	750	100.0	0	0.0	750
Mash Central	726	99.9	1	0.1	727
Mash East	1001	99.9	1	0.1	1002
Mash West	1242	99.8	2	0.2	1244
Mat North	751	100.0	0	0.0	751
Mat South	750	99.6	3	0.4	753
Midlands	1501	100.0	0	0.0	1501
Masvingo	1251	100.0	0	0.0	1251
Harare	3320	99.5	16	0.5	3336
Total	**13384**	**99.7**	**37**	**0.3**	**13421**

3.2 Background characteristics

Table 3 the demographics (sex and age) of the surveyed households. Nationally, more women (55.7%) were sampled for the survey as compared to men (44.3%). Matabeleland South province (58.1%) had the highest proportion of women that were sampled for the survey and the lowest was recorded in Mashonaland East province (53.9%). As for men, the highest proportion that were sampled for the survey was recorded in Mashonaland East province (46.1%). Regarding age groups of the surveyed population, Mashonaland East (13.9%) and Harare (13.9%) provinces had the highest proportion within the 0-4 age group, the highest proportion in the 5-9 years age group was in Mashonaland Central (11.4%) and the highest proportion in the 10-19 years was recorded in Mashonaland West province (19.4%). As for the adult groups, the highest proportion of the surveyed population within the 20-29 years (19.8%) in Matabeleland South and 30-39 years (20.7%) was recorded in Matabeleland North. As for the age group 40-49, the highest proportion was recorded in Masvingo province (14.8%)

and Manicaland had 8.1% of the surveyed population in the 50-59 age group. Bulawayo had 10% of the surveyed population that was above 60 years old.

Table 3: *Average age of the sample population (%)*

Province	Sex		Age group								
	Male	Female	0-4 years	5-9 years	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60+ years	Don't know
Bulawayo	42.8	57.2	11.6	10.6	18.8	16.6	14.3	10.4	7.7	**10.0**	0.2
Manicaland	45.1	54.9	10.	9.9	18.5	16.2	17.8	12.7	**8.1**	6.0	0.1
Mash Central	43.4	56.6	12.4	**11.4**	19.1	17.1	16.6	9.5	6.7	6.8	0.4
Mash East	**46.1**	53.9	**13.9**	11.1	15.0	18.9	17.1	12.5	6.2	5.1	0.3
Mash West	45.3	54.7	11.1	10.8	**19.4**	17.6	15.2	12.7	7.7	5.4	0.2
Mat North	46.0	54.0	9.8	9.7	17.7	17.5	**20.7**	14.0	7.3	2.8	0.6
Mat South	41.9	**58.1**	12.5	9.9	14.3	**19.8**	19.2	12.1	6.3	5.6	0.2
Midlands	44.4	55.6	12.9	11.2	18.6	16.9	16.3	11.7	5.9	6.0	0.5
Masvingo	42.7	57.3	10.5	9.1	16.0	19.2	18.1	**14.8**	6.9	5.2	0.2
Harare	45.0	55.0	**13.9**	11.2	17.2	16.6	17.1	11.8	6.6	5.5	0.2
National	**44.3**	**55.7**	**12.3**	**10.6**	**17.6**	**17.3**	**16.8**	**12.0**	**6.9**	**6.2**	**0.3**

3.3 Background Characteristics of Surveyed Households

The results in Table 4 show that at the national level, the average household size was 4.5 and average age of household head was 43.4 years. Regarding sex of household head, the results revealed that 64.4% of the households were male headed, 35.6% were female headed and it is encouraging to note that only 0.1% were child headed. Disaggregating the data by province, Bulawayo province had the highest proportion of households headed by females (44.6%), elderly persons (24.2%) and also had the highest average age of household head (47.6 years).

Table 4: *Characteristics of surveyed households*

Province	Household size	Age (years)	Male headed (%)	Female headed (%)	Child headed (%)	Elderly headed (%)
Bulawayo	4.6	**47.6**	55.4	**44.6**	0.1	**24.2**
Manicaland	**4.9**	44.0	63.6	36.4	0.0	13.2
Mash Central	4.4	44.2	67.9	32.1	0.0	16.1
Mash East	4.1	41.7	**71.4**	28.6	0.2	10.0
Mash West	4.7	43.9	68.4	31.6	0.1	13.2
Mat North	4.0	41.0	71.0	29.0	**0.3**	5.9
Mat South	4.3	42.0	61.6	38.4	0.0	11.5

Midlands	4.6	43.2	69.0	31.0	0.2	14.2
Masvingo	4.3	41.9	61.2	38.8	0.1	10.1
Harare	4.5	42.4	64.2	35.8	0.2	11.8
National	**4.5**	**43.4**	**64.4**	**35.6**	**0.1**	**13.8**

Regarding the marital status of the household heads, the results presented in Table 5 reveal that nationally, 59.7% of the household heads were married and living together, 14.2% were widowed, 11% were divorcees and 6.2% were never married. Bulawayo province had the highest proportion of widowed (20.5%), cohabiting (2.2%) and never married (13.6%) household heads. Harare had the highest proportion of household heads that were married and living together (67.6%) while Masvingo province had the highest proportion of household heads that were divorcees (12.9%).

Table 5: *Marital status of household heads*

Province	Marital status					
	Married living together (%)	Married living apart (%)	Divorced/ Separated (%)	Widow/ Widower (%)	Cohabiting (%)	Never married (%)
Bulawayo	46.3	7.0	10.5	**20.5**	**2.2**	**13.6**
Manicaland	58.0	**14.5**	9.3	13.7	0.4	4.0
Mash Central	63.9	6.2	10.7	14.9	0.1	4.1
Mash East	62.3	11.4	10.6	10.8	0.2	4.7
Mash West	60.7	7.2	12.6	14.2	0.6	4.8
Mat North	61.1	8.5	12.5	9.1	0.9	7.9
Mat South	55.1	10.4	9.1	13.2	2.3	10.0
Midlands	60.8	8.7	11.9	14.3	0.1	4.2
Masvingo	57.0	11.7	**12.9**	13.6	0.3	4.5
Harare	**67.6**	4.8	10.3	12.8	0.7	3.8
National	**59.7**	**8.1**	**11.0**	**14.2**	**0.8**	**6.2**

Table 6 reveals that a greater proportion of the household heads were employed, 36.9% were informally employed and 24.1% were formally employed. Combining the formally and informally employed, the results indicate that at least 61% of the household heads had a source of income.

Table 6: *Employment status of household heads*

Province	Employment status			
	Not employed (%)	Formally employed (%)	Informally employed (%)	Both (Formally and informally employed) (%)
Bulawayo	**50.8**	19.8	29.1	0.3
Manicaland	45.7	25.6	28.0	**0.7**

Mash Central	30.7	24.7	44.4	0.3
Mash East	30.3	**27.3**	41.9	0.6
Mash West	41.9	21.2	36.6	0.3
Mat North	30.8	46.6	22.0	0.5
Mat South	32.2	21.9	**45.6**	0.3
Midlands	37.5	24.9	37.3	0.2
Masvingo	39.9	26.3	33.6	0.2
Harare	35.6	20.7	43.3	0.4
National	**38.6**	**24.1**	**36.9**	**0.4**

Table 7: *Education level of household heads (%)*

Province	Educational level attained							
	None (%)	Primary level (%)	ZJC level (%)	O' Level (%)	A' Level (%)	Diploma/ Certificate after primary (%)	Diploma/ Certificate after secondary (%)	Graduate /Post graduate (%)
Bulawayo	3.2	21.8	12.0	49.1	4.5	1.7	4.0	3.7
Manicaland	2.9	12.4	11.9	53.6	4.4	3.5	7.1	4.3
Mash Central	3.9	14.0	8.1	55.9	7.4	1.4	4.1	5.1
Mash East	2.4	9.3	8.6	60.1	5.8	2.2	7.2	4.3
Mash West	2.1	12.6	9.6	60.5	5.3	1.0	4.4	4.4
Mat North	1.6	11.1	13.5	50.3	5.3	2.3	9.1	6.8
Mat South	1.9	13.2	12.0	54.7	5.2	0.7	7.3	5.1
Midlands	2.6	13.6	10.3	57.5	3.7	2.3	7.7	2.3
Masvingo	1.4	9.1	11.2	52.5	7.4	2.4	8.3	7.6
Harare	1.7	9.3	12.8	61.2	5.3	1.0	4.6	4.1
National	**2.3**	**12.8**	**11.3**	**56.3**	**5.3**	**1.7**	**5.9**	**4.5**

These results indicate that the country has made significant strides in achieving universal primary education as at least 97.8% of the household heads had completed primary education and 73.7% had completed O' Level. The Government's efforts to ensure that education is everyone's right has resulted in Zimbabwe being among the countries with the highest literacy rate on the African continent.

4. Water, Sanitation and Hygiene (WASH)

4.1 Introduction

The 2030 Agenda for Sustainable Development comprises of 17 Sustainable Development Goals and 169 global targets. Goal 6 aims to 'ensure availability and sustainable management of water and sanitation for all' and includes targets for universal access to safe drinking water, sanitation and hygiene[16]. Safe drinking-water, sanitation and hygiene are crucial to human health and well-being. Drinking water services refer to the accessibility, availability and quality of the main source used by households for drinking, cooking, personal hygiene and other domestic uses. Worldwide, 2.2 billion people still lack access to safe drinking water and 3 billion people do not have access to handwashing facilities with soap[17]. As of 2020, 26% of the worldwide population lacked safely managed drinking-water services and approximately 144 million people still collected drinking-water directly from surface water[18]. For the Republic of Zimbabwe, the National Development Strategy 1's thrust is to improve water supply, ensuring that the proportion of the country's population using a secure, potable drinking water source increases. The target is to increase access to potable water to at least 90% by 2025 (GoZ, 2020). With regards to sanitation, the Government of Zimbabwe aims to expand access to improved sanitation facilities to 77.32% by 2025, in both urban and rural areas.

4.2 Descriptive Statistics

4.2.1 Water services

As shown in Figure 2, access to improved water sources at national level was 97% which is well above the NDS 1 target of 90% for urban areas. Harare recorded the least in-terms of provision of improved water sources at 95%, which is still above the 90% NDS 1 target of 90%. The Government of Zimbabwe is applauded for this positive outcome.

Using the Sustainable Development Goals (SDG) criteria for provision of water services, the national average was at 48.4% for basic water services (*drinking water from an improved source*[19]*, provided collection time is not more than 30 minutes for a roundtrip including queuing*) and 49.1% for limited services (*drinking water from an improved source for which*

[16] WHO/UNICEF (2021)
[17] UNICEF (2023)
[18] WHO (2021)
[19] Improved drinking water sources are those that have the potential to deliver safe water by nature of their design and construction, and include: piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water. https://washdata.org/monitoring/drinking-water

collection time exceeds 30 minutes for a roundtrip including queuing), meaning that in terms of water quality, 97.5% of the sampled households had access to water from an improved water source[20] (Table 8).The high access to limited water services is attributed to Government's intervention through the drilling of community boreholes. Against the presented evidence, Government is applauded and encouraged to continue with such interventions to cover deficits in urban authorities.

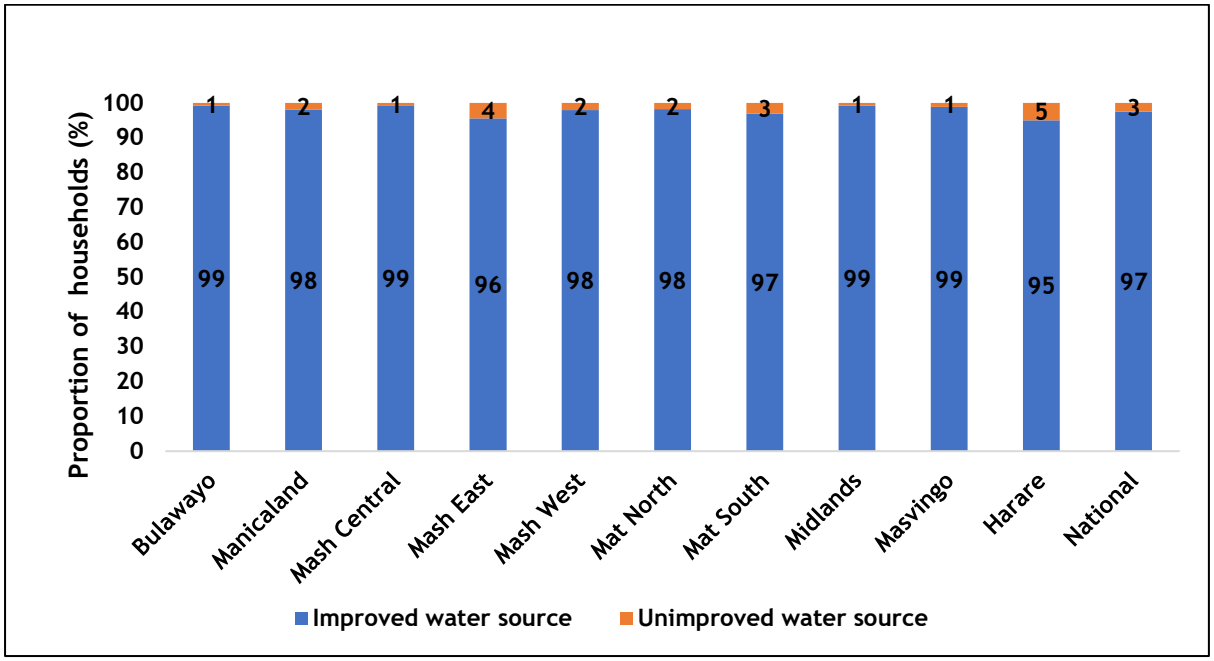


Figure 2: *Status of water sources for the 10 provinces*

Table 8: *Status of provision of water services in the 10 provinces*

Province	SDGs water services			
	Basic (%)	Limited (%)	Unimproved (%)	Surface water (%)
Bulawayo	86.0	13.2	0.7	0.0
Manicaland	54.8	43.2	2.0	0.0
Mash Central	44.4	54.8	0.8	0.0
Mash East	20.5	75.1	4.4	0.0
Mash West	47.4	50.6	1.9	0.2
Mat North	69.0	29.3	0.4	1.3
Mat South	73.9	23.1	2.9	0.1
Midlands	52.0	47.2	0.8	0.0
Masvingo	53.1	45.8	1.1	0.0
Harare	19.1	75.8	5.0	0.1
National	**48.4%**	**49.1%**	**2.4%**	**0.1%**

With respect to sanitation, the results presented in Table 9 show that at national level, 46.6% of the households had basic sanitation facilities and only 1.2% had unimproved sanitation facilities. For basic sanitation, this is an improvement from an average of 41%

[20] Drinking water from an unprotected dug well or unprotected spring

recorded in the 2020 Urban Livelihoods Assessment Report (FNC, 2020). Nationally, 2.8% of the households were still practising open defecation, which is an increase from the 2% recorded in 2020.

Disaggregating the data by province, Bulawayo (65%) had the highest proportion of households with basic sanitation facilities whilst the proportion of households still practising open defecation was highest in Matabeleland South (9.9%).

Table 9: *Sanitation practices in the 10 provinces of Zimbabwe*

Province	SDG Sanitation			
	Open defecation (%)	Unimproved (%)	Limited (%)	Basic (%)
Bulawayo	1.3	0.3	33.5	65.0
Manicaland	0.5	6.1	45.2	48.1
Mash Central	7.9	0.4	54.7	37.1
Mash East	0.8	2.8	48.8	47.7
Mash West	5.2	1.0	50.0	43.8
Mat North	4.5	0.9	47.8	46.7
Mat South	9.9	0.3	54.4	35.5
Midlands	4.1	0.6	53.8	41.5
Masvingo	1.2	0.2	61.5	37.1
Harare	0.8	1.2	52.1	45.8
National	2.8	1.2	49.5	46.6

4.3 Inferential Analysis of WASH

The results presented in Table 10 show that *ceteris paribus*, at the 1% level of significance, a female headed household was 4.78% more likely to have a handwashing station and 4.31% likelihood of having handwashing soap at the station. Having a household head with a chronic illness was a significant predictor at 1% level of significance, with 6.63% less likelihood to have soap at the handwashing station *ceteris paribus*. Religion had a significant role in hygiene and sanitation practices with households headed by a member of the Pentecostal and Apostolic sect less likely to have a handwashing station and handwashing with soap. More so, at the 1% significance level, households headed by a member of the apostolic sect was 1.62 % more likely to resort to open defecation, *ceteris paribus*. At provincial level, Bulawayo province was 1.19% more likely to have handwashing stations and 8.32% more likely to have soap at the hand washing facility at the 1% level of significance. Households in Masvingo were 3.70% less likely to have a handwashing facility at 5% significance level.

Table 10: *Household background characteristics and hygiene practices*

VARIABLES	Handwashing station	Handwashing water	Handwashing soap	Open defecation
Household head is female	0.0478***	0.00290	0.0431**	0.00360
	(0.0133)	(0.0187)	(0.0212)	(0.00423)
Household head age [Years]	0.00211***	-8.76e-05	0.00123*	-0.000180
	(0.000384)	(0.000583)	(0.000642)	(0.000133)
Married living apart	0.0103	-0.00756	-0.0231	-0.00319
	(0.0167)	(0.0248)	(0.0272)	(0.00550)
Divorced/separated	-0.0438**	0.0208	-0.0533*	0.00326
	(0.0174)	(0.0264)	(0.0295)	(0.00619)
Widow/widower	-0.0619***	-0.00877	-0.0456	-0.000757
	(0.0180)	(0.0255)	(0.0291)	(0.00557)
Cohabiting	-0.245***	0.00200	0.0578	-0.0279***
	(0.0385)	(0.0929)	(0.0803)	(0.00950)
Never married	0.0326*	-0.0373	0.00197	-0.0105
	(0.0198)	(0.0289)	(0.0309)	(0.00643)
Household head is chronically ill	0.00252	-0.0392**	-0.0663***	-1.27e-05
	(0.0118)	(0.0181)	(0.0195)	(0.00405)
Household size	0.00639***	0.00196	-0.0288***	-0.00130
	(0.00243)	(0.00358)	(0.00402)	(0.000822)
Protestant	-0.0333*	-0.0140	-0.0429	-0.00155
	(0.0177)	(0.0248)	(0.0274)	(0.00439)
Pentecostal	-0.0612***	-0.0205	-0.0657***	0.00286
	(0.0159)	(0.0225)	(0.0245)	(0.00437)
Apostolic Sect	-0.114***	-0.0239	-0.0951***	0.0162***
	(0.0162)	(0.0243)	(0.0265)	(0.00491)
Zion	-0.0912***	-0.0501	-0.0536	0.00616
	(0.0231)	(0.0363)	(0.0388)	(0.00765)
Other Christian	0.000209	0.0323	0.0907**	0.0177**
	(0.0228)	(0.0331)	(0.0363)	(0.00830)
Islam	-0.134***	-0.0289	-0.0555	0.0135
	(0.0456)	(0.0904)	(0.0954)	(0.0187)
Traditional	-0.129***	-0.168**	-0.285***	0.00640
	(0.0467)	(0.0851)	(0.0763)	(0.0170)
Other religion	-0.00144	0.0990**	0.0288	-0.00385
	(0.0374)	(0.0455)	(0.0548)	(0.0101)
No religion	-0.0982***	-0.0510	-0.177***	0.0180**
	(0.0211)	(0.0338)	(0.0358)	(0.00760)
Bulawayo	0.191***	-0.0769***	0.0832***	0.00456*
	(0.0140)	(0.0199)	(0.0215)	(0.00255)
Manicaland	0.175***	0.0786***	0.173***	0.000859
	(0.0198)	(0.0238)	(0.0290)	(0.00315)
Mash Central	0.00471	-0.0454	0.0836**	0.0703***
	(0.0198)	(0.0335)	(0.0368)	(0.0101)
Mash East	0.0234	-0.132***	-0.0481	-0.00171
	(0.0169)	(0.0297)	(0.0309)	(0.00314)
Mash West	0.0255	-0.161***	-0.0847***	0.0454***
	(0.0163)	(0.0277)	(0.0285)	(0.00653)
Mat North	0.0887***	0.0753***	0.155***	0.0362***

	(0.0200)	(0.0263)	(0.0317)	(0.00779)
Mat South	0.142***	0.0160	0.150***	0.0917***
	(0.0207)	(0.0277)	(0.0317)	(0.0112)
Midlands	-0.150***	-0.0309	0.00819	0.0293***
	(0.0131)	(0.0328)	(0.0359)	(0.00554)
Masvingo	-0.0370**	-0.166***	-0.0603**	0.00343
	(0.0158)	(0.0294)	(0.0293)	(0.00349)
Income	0.0314***	0.00202	0.0227***	-0.00801***
	(0.00340)	(0.00429)	(0.00530)	(0.00148)
Constant	-0.103**	0.764***	0.313***	0.110***
	(0.0494)	(0.0697)	(0.0824)	(0.0197)
Observations	12,930	4,808	4,808	13,269
R-squared	0.077	0.033	0.057	0.040

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11 shows that at the 1% level of significance, a female headed household was 3.18% less likely to have a protected well as compared to male headed households, *ceteris paribus*. In addition, households headed by older persons were associated with having a borehole and using water piped into dwelling while low income earning households were more likely to use water piped into yard and less likely to have water piped into dwelling and less likely to use water from unprotected wells.

Disaggregating the results by province, residents in Bulawayo were 66.2% more likely to have water piped into dwelling and 3.63% less likely to have an unprotected well. Midlands was 6.66% more likely to have water piped into a public tap than reference province Harare.

Table 11: *Correlates of background household characteristics against sources of water*

VARIABLES	Piped into dwelling	Piped into yard	Piped into public tap	Piped into neighboring yard	Borehole	Protected well	Unprotected well
Household head is female	0.0228*	0.0123	-0.00494	-0.00137	-0.00691	-0.0318***	0.00639*
	(0.0122)	(0.00828)	(0.00431)	(0.00296)	(0.00903)	(0.00898)	(0.00365)
Household head age [Years]	0.00113***	-4.63e-05	-0.000242*	-8.65e-05	0.000621**	-0.000927***	-0.000236**
	(0.000349)	(0.000250)	(0.000140)	(9.53e-05)	(0.000272)	(0.000253)	(9.99e-05)
Widow/widower	-0.0201	-0.0152	0.0116*	0.00717*	-0.000556	0.0266**	-0.00671
	(0.0163)	(0.0112)	(0.00640)	(0.00403)	(0.0122)	(0.0120)	(0.00439)
Cohabiting	0.0478	-0.0253	-0.00158	-0.0122***	-0.0594***	0.0747***	0.000777
	(0.0350)	(0.0262)	(0.0166)	(0.00232)	(0.0213)	(0.0264)	(0.0126)
Never married	-0.00693	0.00394	-0.0124**	0.00134	0.0307**	0.00454	-0.0102***
	(0.0180)	(0.0132)	(0.00591)	(0.00514)	(0.0133)	(0.0117)	(0.00389)
Household head does not have any disability	-0.0393***	0.0351***	-0.00303	0.00159	0.0199*	-0.00278	-0.00745*
	(0.0138)	(0.00942)	(0.00592)	(0.00304)	(0.0109)	(0.0102)	(0.00445)

Household head is chronically ill	-0.0173	-0.000437	0.00609	-0.00251	0.0204**	-0.00151	-0.00148
	(0.0109)	(0.00788)	(0.00462)	(0.00245)	(0.00848)	(0.00772)	(0.00282)
Household size	-0.00536**	-6.83e-05	-0.000759	-0.00142***	0.00230	0.00422***	0.00208***
	(0.00220)	(0.00155)	(0.000788)	(0.000544)	(0.00169)	(0.00162)	(0.000671)
Number of orphaned members	0.0160	-0.00534	0.00555	0.00404	-0.0134	-0.00382	-0.00445
	(0.0182)	(0.0116)	(0.00805)	(0.00538)	(0.0129)	(0.0134)	(0.00362)
Protestant	-0.0357**	-0.00452	0.00196	0.00116	0.0317***	-0.000243	0.000710
	(0.0164)	(0.0113)	(0.00583)	(0.00415)	(0.0121)	(0.0111)	(0.00342)
Pentecostal	-0.0615***	-0.00528	0.0134**	-0.00395	0.0319***	0.0228**	0.00439
	(0.0148)	(0.0102)	(0.00572)	(0.00359)	(0.0107)	(0.0100)	(0.00318)
Apostolic Sect	-0.127***	0.0191*	0.0136**	0.000750	0.0127	0.0639***	0.0119***
	(0.0153)	(0.0108)	(0.00586)	(0.00392)	(0.0112)	(0.0108)	(0.00375)
Zion	-0.104***	0.0163	0.0275***	0.00316	0.0261*	0.0251**	0.00296
	(0.0219)	(0.0166)	(0.00997)	(0.00585)	(0.0148)	(0.0127)	(0.00426)
Other Christian	-0.00133	-0.0204	-0.0197***	-0.00854*	0.0125	0.0364***	0.00733
	(0.0210)	(0.0148)	(0.00640)	(0.00469)	(0.0151)	(0.0134)	(0.00468)
Islam	-0.119***	0.0286	-0.000860	-0.00743	0.0814*	-0.00716	0.0160
	(0.0447)	(0.0354)	(0.0170)	(0.0102)	(0.0430)	(0.0353)	(0.0170)
Other religion	-0.109***	0.0819***	0.000108	0.00396	-0.0106	0.0345	0.00907
	(0.0365)	(0.0289)	(0.0120)	(0.00983)	(0.0240)	(0.0236)	(0.00955)
No religion	-0.117***	0.00204	0.0182**	0.00375	0.0297*	0.0467***	0.0111**
	(0.0196)	(0.0134)	(0.00838)	(0.00561)	(0.0152)	(0.0148)	(0.00560)
Bulawayo	0.662***	0.0868***	-0.00339	0.00583***	-0.309***	-0.388***	-0.0363***
	(0.0106)	(0.00772)	(0.00370)	(0.00217)	(0.00844)	(0.00877)	(0.00340)
Manicaland	0.357***	0.258***	-0.00404	0.0119***	-0.264***	-0.333***	-0.0289***
	(0.0192)	(0.0167)	(0.00539)	(0.00433)	(0.0112)	(0.0124)	(0.00515)
Mash Central	0.247***	0.150***	-0.00419	0.0205***	-0.159***	-0.206***	-0.0320***
	(0.0195)	(0.0146)	(0.00526)	(0.00562)	(0.0155)	(0.0170)	(0.00458)
Mash East	0.0236	0.157***	0.00489	0.00587*	-0.109***	-0.0686***	-7.38e-05
	(0.0144)	(0.0127)	(0.00553)	(0.00306)	(0.0150)	(0.0172)	(0.00710)
Mash West	0.282***	0.0562***	0.0348***	0.0374***	-0.104***	-0.273***	-0.0242***
	(0.0157)	(0.00831)	(0.00692)	(0.00561)	(0.0140)	(0.0128)	(0.00488)
Mat North	0.502***	0.0913***	0.132***	0.00643*	-0.286***	-0.402***	-0.0378***
	(0.0182)	(0.0122)	(0.0134)	(0.00367)	(0.00933)	(0.00879)	(0.00363)
Mat South	0.551***	0.0455***	-0.00329	0.0135***	-0.217***	-0.402***	-0.0382***
	(0.0176)	(0.0102)	(0.00527)	(0.00479)	(0.0132)	(0.00872)	(0.00372)
Midlands	0.334***	0.137***	0.0666***	0.0127***	-0.139***	-0.362***	-0.0395***
	(0.0148)	(0.0104)	(0.00774)	(0.00338)	(0.0126)	(0.0102)	(0.00364)
Masvingo	0.335***	0.239***	-0.00821**	0.0111***	-0.188***	-0.343***	-0.0317***
	(0.0159)	(0.0130)	(0.00398)	(0.00336)	(0.0122)	(0.0108)	(0.00418)
Income	0.0224***	-0.00600***	0.00111	-0.00109**	0.00306*	-0.0133***	-0.00353***
	(0.00280)	(0.00199)	(0.000848)	(0.000451)	(0.00163)	(0.00163)	(0.000568)
Constant	0.00752	0.0621**	0.0106	0.0243***	0.188***	0.555***	0.0838***
	(0.0425)	(0.0307)	(0.0144)	(0.00807)	(0.0280)	(0.0284)	(0.0112)
Observations	13,263	13,263	13,263	13,263	13,263	13,263	13,263
R-squared	0.241	0.065	0.043	0.011	0.094	0.207	0.023

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5. Energy

5.1 Introduction

The National Development Strategy 1 acknowledges the right of Zimbabweans to access reliable power to serve both their economic and social needs.[21] One of those social uses of energy is that of facilitating the preparation of and storage of food within a household. As such "because food has to be cooked for it to be palatable and safe, food security cannot be guaranteed if there is no access to energy for cooking it.[22] In addition, energy insecurity can influence cooking practices and the type, quantity and quality of food, and can thus be a cause of malnutrition.[23]

5.2 Descriptive Analysis of Energy Sources

5.2.1 Main Source of Cooking Energy

Figure 3 shows that nationally, 50.7% of sampled urban households used electricity as the main source of cooking energy. This was followed by wood fuel (21.5%) and Liquefied Petroleum Gas (LPG) (20.2%). For Harare, even though electricity was the main source of cooking energy used by most households (37.9%), this figure however pales in comparison to other areas. This low figure is partly informed by the situation obtaining in some of the domains that do not enjoy the services and amenities accessed by other areas of the city. For instance, only 3% of sampled households in Harare South and 6% in Epworth indicated that they use electricity as the main source of cooking energy.

5.2.2 Availability of Main Source of Cooking Energy

The energy sources presented in Figure 3 were not always available as 41.1% of the households nationally indicated. At national level, Table 12 shows that 31.2% of households indicated that the main energy source for cooking was always available.

[21] https://veritaszim.net/sites/veritas_d/files/NDS.pdf
[22] Bogdanski, A. (2012). Integrated food-energy systems for climate-smart agriculture. *Agriculture & Food Security, 1*(1), 1.
[23] Sola, P., Ochieng, C., Yila, J. (2016). https://doi.org/10.1007/s12571-016-0570-1

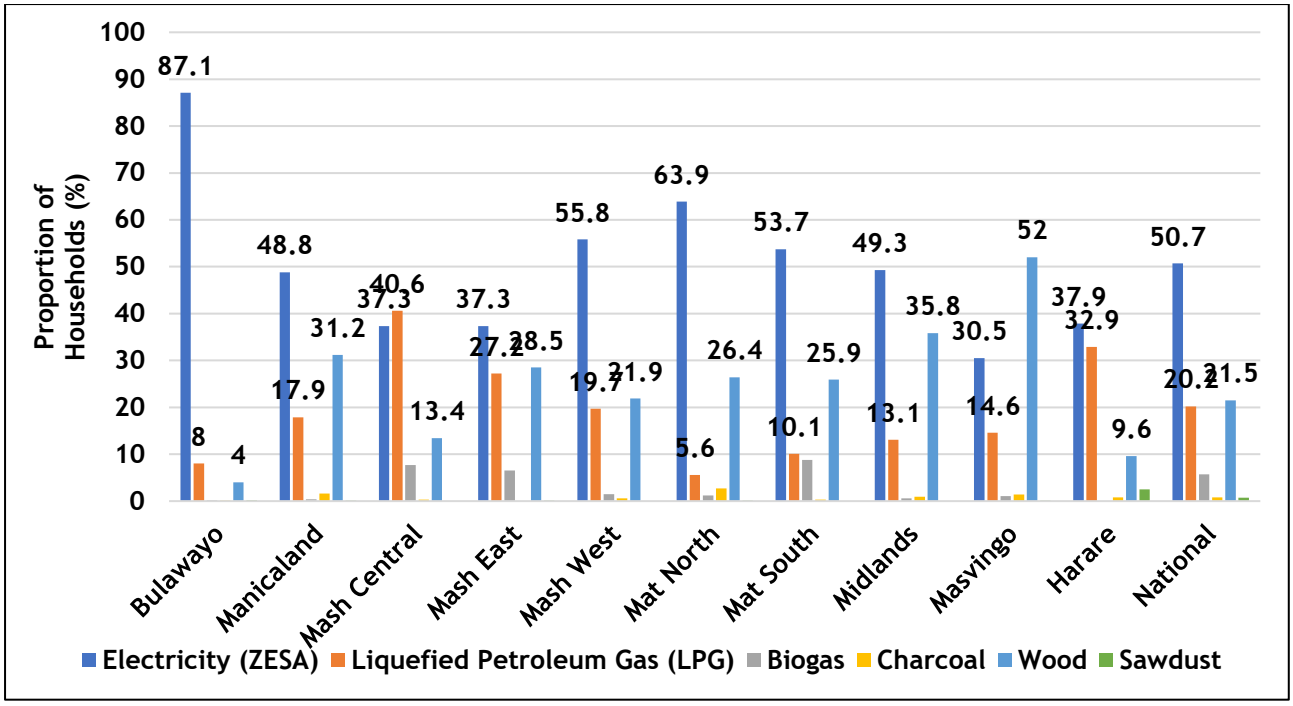


Figure 3: *Main Source of Cooking Energy*

Table 12: *Availability of Main Source of Cooking Energy*

	Main fuel/energy available		
	No (%)	Yes (%)	Sometimes (%)
Bulawayo	60.8	16.9	22.2
Manicaland	23.0	39.9	37.2
Mash Central	41.0	21.0	38.0
Mash East	33.5	31.4	35.1
Mash West	34.2	30.2	35.6
Mat North	4.0	87.9	8.1
Mat South	20.8	16.1	63.0
Midlands	38.8	45.3	15.9
Masvingo	55.8	33.8	10.5
Harare	41.5	26.2	32.3
Total	**41.1**	**31.2**	**27.7**

5.2.3 Households' Main Sources of Lighting Energy

For lighting, most households (62.8%) indicated that they mainly used electricity as shown in Figure 4. Solar (14.6%) and candles (11%) were the second and third most used main sources of lighting. It is noteworthy that there is a marked difference in terms of household electricity utilisation depending on purpose of use. Whilst 50.7% of households indicated that they used electricity for cooking, there was an even larger proportion (62.8%) of households using the same for lighting nationally. This could mean that supply challenges

are not solely responsible for the use of other sources of energy for cooking. Hence, the electricity cost factor might partly account for this mismatch. There is therefore a risk that the claims made by Sola et al (2016) in the foregoing pertaining to energy insecurity potentially altering households' diets and cooking practices could be true in this case.

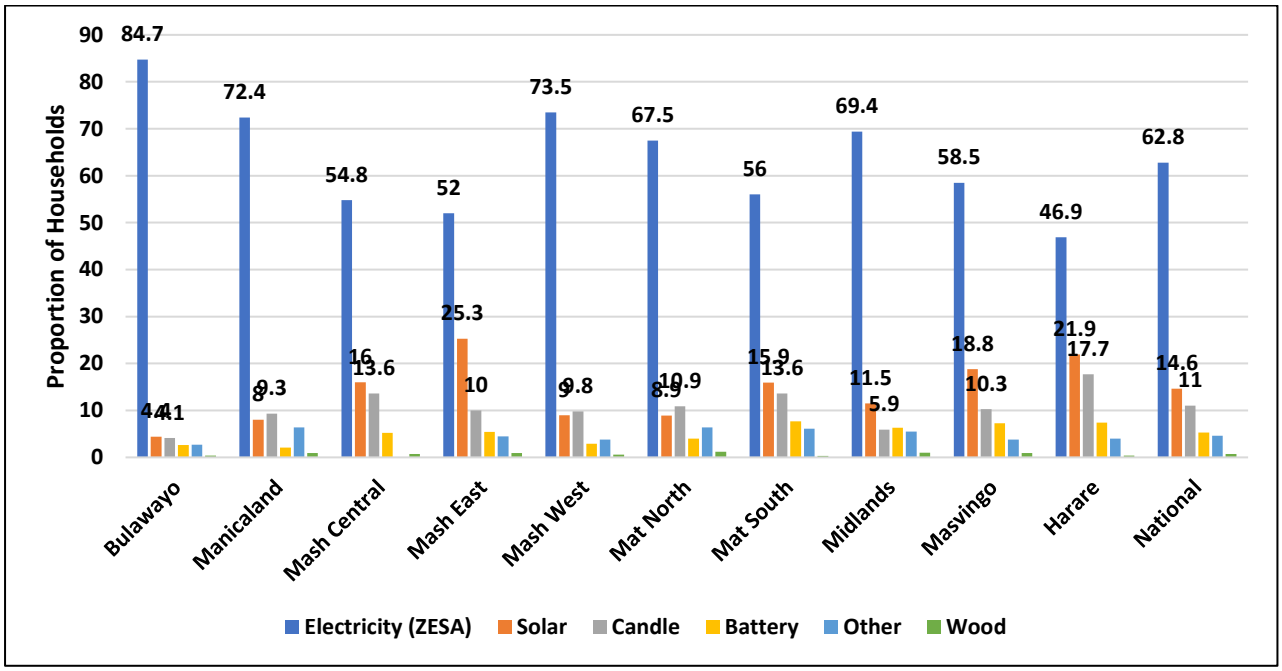


Figure 4: *Households' main sources of lighting energy*

5.3 Inferential analysis of main sources of cooking energy

The assessment findings summarised in Table 13 (Column I) show that ceteris paribus the larger the household the probability of it using electricity as the main source of cooking energy is reduced by 1.76% at 1% level of significance. In column III for the same variable, the findings show that there is increased probability (by 1.9%) of such households using wood fuel as the main source of cooking energy instead. For households headed by the never married, holding all other factors constant, there is a propensity to use electricity for cooking by 6.01% at 1% level of significance. On the other side of the divide, using the same variable, there was a 3.88% less likelihood of such households using wood fuel as the main source of cooking energy. Table 13 (column III) also shows that if the household head has a chronic condition, there is an increased propensity (by 3.92%) for such households to opt for wood fuel as the main source of cooking energy at the 1% level of significance. In addition, Table 13 (columns I and II respectively) show that households with higher incomes tend to prefer electricity (4.69%) and LPG (0.825%) as their main sources of power. However, holding

all things constant, such households tended to have less preference (4.88%) for wood fuel as their main source of cooking energy at 1% level of significance. Finally, with respect to provinces, Table 13 (column I) shows that Bulawayo (46.9%), Mashonaland West (17.7%) and Midlands (13.6%) were more likely to use electricity than other provinces at 1% level of significance. At 1% level of significance, being in Mashonaland Central increases (by 8.25%) the likelihood of using LPG for cooking. Similarly, Table 13 (column III) highlights that being resident in all the provinces with the exception of Bulawayo increased the probability, albeit at different levels, of using wood fuel as the main source of cooking energy.

Table 13: *Correlates of Main Energy Sources for Cooking*

VARIABLES	(I) Electricity	(II) LPG	(III) Wood fuel
Household head is female	-0.00244	0.00505	0.00608
	(0.0125)	(0.0106)	(0.00968)
Household head age [Years]	0.00300***	-0.00234***	0.000320
	(0.000362)	(0.000296)	(0.000304)
Married living apart	-0.00131	0.0236*	-0.00758
	(0.0159)	(0.0135)	(0.0132)
Divorced/Separated	0.0108	-0.0129	0.00298
	(0.0166)	(0.0139)	(0.0134)
Widowed/Widower	-0.0180	0.0275**	0.000147
	(0.0169)	(0.0139)	(0.0136)
Cohabiting	0.0948**	-0.125***	0.0142
	(0.0372)	(0.0222)	(0.0341)
Never married	0.0601***	-0.0200	-0.0388***
	(0.0181)	(0.0156)	(0.0132)
Household head does not have any disability	-0.00228	0.00141	0.00194
	(0.0148)	(0.0117)	(0.0124)
Household head is chronically ill	-0.0253**	-0.0247***	0.0392***
	(0.0111)	(0.00880)	(0.00955)
Household Size	-0.0176***	-0.00242	0.0190***
	(0.00233)	(0.00187)	(0.00196)
Number of orphaned members	0.0217	-0.0301**	0.0232
	(0.0173)	(0.0123)	(0.0158)
Protestant	-0.0262	0.0106	0.00887
	(0.0169)	(0.0136)	(0.0125)
Pentecostal	-0.0456***	0.0154	0.0167
	(0.0151)	(0.0121)	(0.0115)
Apostolic sect	-0.148***	0.0144	0.106***
	(0.0157)	(0.0127)	(0.0125)
Zion	-0.136***	0.0343*	0.0874***
	(0.0219)	(0.0176)	(0.0190)
Other Christian	-0.0541**	0.0380**	-0.0115
	(0.0221)	(0.0175)	(0.0180)
Islam	-0.115**	0.00912	0.104**
	(0.0484)	(0.0411)	(0.0425)
Traditional	-0.140***	-0.0233	0.0387
	(0.0440)	(0.0362)	(0.0348)

Other religion	-0.000611	-0.0201	-0.00261
	(0.0333)	(0.0275)	(0.0247)
No religion	-0.140***	0.0354**	0.0860***
	(0.0203)	(0.0171)	(0.0164)
Bulawayo	0.469***	-0.232***	-0.0569***
	(0.0117)	(0.0105)	(0.00723)
Manicaland	0.109***	-0.148***	0.209***
	(0.0196)	(0.0163)	(0.0172)
Mashonaland Central	-0.0139	0.0825***	0.0416***
	(0.0194)	(0.0200)	(0.0131)
Mashonaland East	0.00177	-0.0637***	0.189***
	(0.0173)	(0.0164)	(0.0148)
Mashonaland West	0.177***	-0.126***	0.118***
	(0.0160)	(0.0140)	(0.0123)
Matabeleland North	0.266***	-0.274***	0.163***
	(0.0190)	(0.0120)	(0.0162)
Matabeleland South	0.165***	-0.228***	0.159***
	(0.0196)	(0.0139)	(0.0165)
Midlands	0.136***	-0.194***	0.239***
	(0.0153)	(0.0121)	(0.0134)
Masvingo	-0.0758***	-0.188***	0.431***
	(0.0154)	(0.0131)	(0.0147)
Income	0.0469***	0.00825***	-0.0488***
	(0.00315)	(0.00198)	(0.00301)
Constant	-0.151***	0.325***	0.529***
	(0.0464)	(0.0334)	(0.0429)
Observations	13,259	13,259	13,259
R-squared	0.173	0.082	0.179

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The findings highlighted in **Table 13** are in sync with established knowledge in literature on factors informing households' energy choices in low resource settings. Mbaka et al (2019) in their study came to the conclusion that "…an increase in a household's income translated to an increase in proportions of clean energy consumed and lower proportions of kerosene, charcoal and wood fuel."[24] Similarly, their study also established that "married household heads are likely to [use] higher proportions of wood fuel in reference to a single household head. The observation on the income-energy use interactions is theoretically established in literature as illustrated in the energy ladder model in **Figure 5.** It is clear from the model that as households' incomes improve, they tend to prefer non-solid sources of energy which are generally much cleaner and efficient compared to their solid counterparts that poorer households are forced to use. Similarly, the concept of fuel stacking is well established in literature where it is argued that households do not completely forego the solid less clean

[24] Mbaka, C.K., Gikonyo, J. & Kisaka, O.M. Households' energy preference and consumption intensity in Kenya. *Energ Sustain Soc* **9**, 20 (2019). https://doi.org/10.1186/s13705-019-0201-8

sources of energy when they start realising higher incomes. Instead, "they do not fully switch to different fuel types, they rather use an energy mix or as part of a menu."[25]

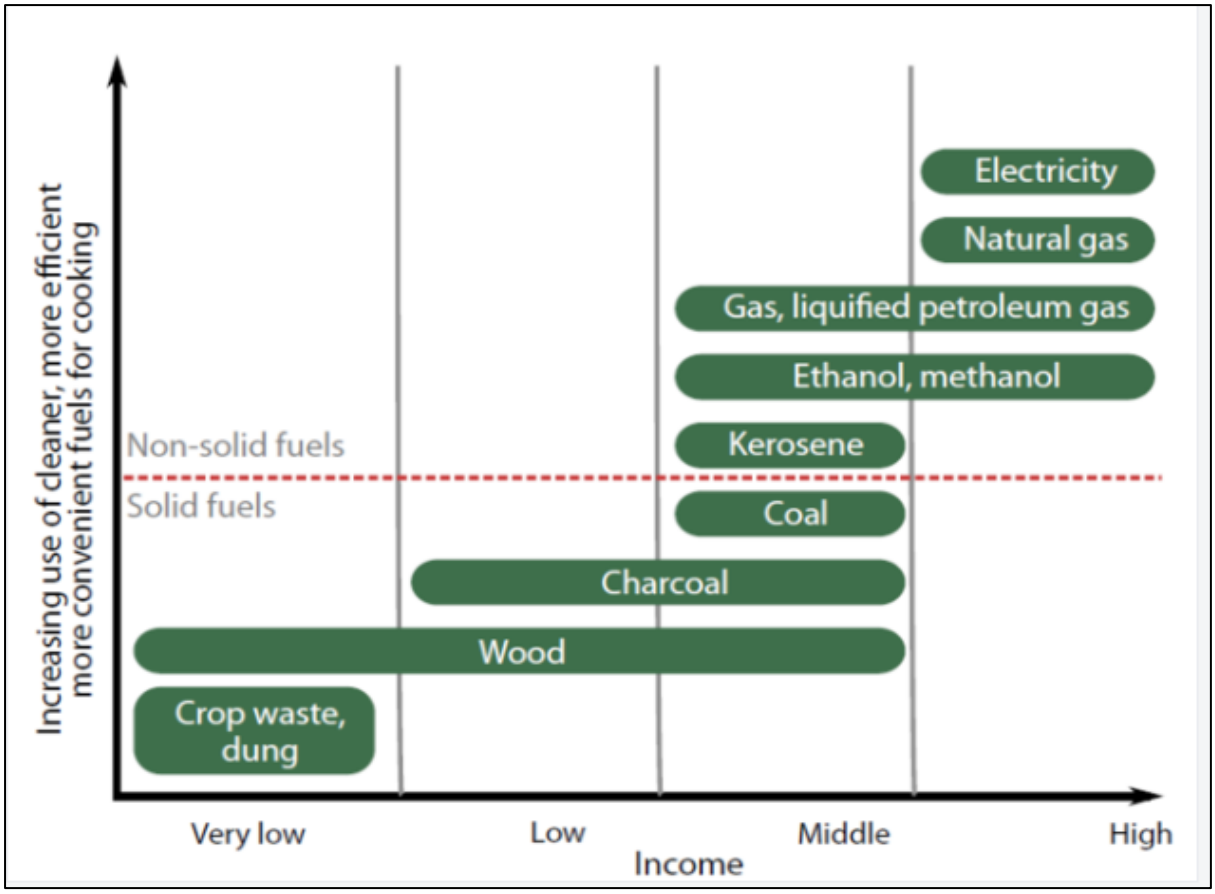


Figure 5: *The energy Ladder*

6. Urban Agriculture

The practice of urban agriculture has gained importance due to the rising rate of urban poverty and population in many developing countries [26]. Orsini et al[27] defines urban agriculture as any agricultural activity which grows, raises, processes and distributes agricultural products regardless of land size and number of human resources within the cities and towns. Urban agriculture is a possible livelihood diversification strategy, which can potentially alleviate urban food insecurity for low-income communities[28]. More so,

[25] Erdmann, T. & Haigh, M. (2013). The Energy Ladder: A Model for Projecting Energy Demand. Retrieved from: http://www.biee.org/wpcms/wp-content/uploads/Erdmann-The-Energy-Ladder-v2.pdf

[26] Rezai et. Al (2016). https://doi.org/https://doi.org/10.1016/j.sbspro.2015.12.006

[27] Orsini et al. (2013). Urban agriculture in the developing world: a review. Agron. Sustain. Dev. 33, 695–720. https://doi.org/10.1007/s13593-013-0143-z

[28] Ziga, M., & Karriem, A. (2021). Role of Urban Agriculture Policy in Promoting Food Security in Bulawayo, Zimbabwe. In The Palgrave Encyclopedia of Urban and Regional Futures (pp. 1-7). Springer.

urban agriculture has been widely upheld as a solution to the food-crisis facing increasingly metropolitan populations[3]. In Zimbabwe's major cities, urban households have been reported to be growing different crops and rearing chickens, ducks, and pigeons for both subsistence and commercial purposes[29]. This growth in urban agriculture has been promoted by both national and local Government's recognition of the instrumental role it plays in promoting the livelihoods of urban people. Urban agriculture increases food security through two main pathways: improved access to food and increased income. Home-grown foods can increase the total amount of food available to a household and thus can prevent hunger and malnutrition[30]. In addition, animal husbandry provides an important source of animal protein, which is commonly limited in poor households' diets due to income constraints. In this section, the results on agriculture in urban areas are presented.

6.1 Descriptive Analysis

6.1.1 Households Practising Urban Agriculture

The results in Table 14 show that 22.2% of the surveyed households reported practising urban agriculture. At province level, urban agriculture was practised in Mashonaland East (46.6%) and Matabeleland South (2.3%) had the least proportion of households that were practising urban agriculture. The results in Table 14 also show that the most practised form of agriculture was crop/horticulture production (20.2%), followed by mixed agriculture (crop/horticulture and livestock production) (1.3%) and then livestock production (0.5%). Crop/horticulture production was most common in Mashonaland East province (43.9%) and least popular in Matabeleland South (1.73%). Livestock production was very limited across all provinces.

Table 14: *Households practising urban agriculture*

Province	Households practising urban agriculture (%)	Crops/horticulture production (%)	Livestock production (%)	Crops/horticulture and livestock production (%)
Bulawayo	25.2	23.0	0.47	1.04
Manicaland	35.7	33.1	0.27	2.40
Mash Central	32.5	30.9	0.28	1.24
Mash East	**46.6**	**43.9**	0.10	2.50
Mash West	20.2	18.97	0.40	0.80
Mat North	12.7	10.52	0.67	1.46
Mat South	2.3	1.73	0.27	0.27
Midlands	27.6	25.98	0.47	1.07

[29] Dhewa, C. (2015). Rapid Growth of Urban Farming in Harare, Zimbabwe. http://www.cityfarmer.info/2015/11/03/rapid-growth-of-urbanfarming-in-harare-zimbabwe/

[30] Stewart et al. (2013). https://doi.org/10.1186/2047-2382-2-7

Masvingo	20.0	15.27	**1.20**	**3.52**
Harare	13.4	12.17	0.45	0.66
National	**22.2**	**20.2**	**0.5**	**1.3**

6.1.2 Common Crops Grown in Urban Areas

The crop most grown by urban households was maize (47.3%) followed by leafy vegetables (28.8%). Yams (0.3%) were the least grown crop (Table 15). Maize production was most popular in Mashonaland Central province (80.6%) and production of leafy vegetables was most common in Matabeleland North province (65.6%). The results in Table 14 also show the diversity of crops grown by urban households, i.e., cereal grain, tubers, leafy vegetables, and bulbs. This is a positive result as the diversity of the crops grown contributes to improved diets for urban households. It is interesting to note that in some urban areas such as Matabeleland South, wheat (5.3%) is the commonly grown crop.

Table 15: *Type of crops grown by urban households*

Province	Green leafy vegetables (%)	Sweet potatoes (%)	Cucumbers (%)	Onions (%)	Tomatoes (%)	Butternut (%)	Potatoes (%)	Yams (%)	Legumes (beans, peas) (%)	Maize (%)	Wheat (%)	Other (%)
Bulawayo	37.1	4.4	0.2	5.3	4.4	0.6	0.2	0.0	4.3	40.2	0.3	**3.0**
Manicaland	32.1	2.2	0.2	1.6	1.6	0.0	0.6	1.6	7.7	49.1	0.4	2.8
Mash Central	5.3	2.1	0.4	0.4	0.4	0.0	0.4	0.0	7.4	**80.6**	0.4	2.8
Mash East	29.4	**6.5**	**0.8**	4.3	4.6	0.4	1.1	0.3	10.2	40.5	1.0	1.1
Mash West	24.3	3.9	0.5	6.1	6.6	0.0	0.0	0.0	2.2	52.7	0.2	3.6
Mat North	**65.6**	0.8	0.0	6.3	4.7	0.0	0.0	0.8	1.6	18.0	0.0	2.3
Mat South	26.3	0.0	0.0	0.0	5.3	0.0	0.0	0.0	5.3	57.9	**5.3**	0.0
Midlands	26.6	2.5	0.3	2.1	2.8	**0.7**	0.3	0.0	4.5	57.0	1.2	1.9
Masvingo	30.2	1.7	0.6	**9.3**	**10.8**	0.2	**1.7**	0.0	5.1	37.3	0.2	3.0
Harare	22.4	4.1	0.1	3.3	3.9	**0.7**	0.7	0.4	**10.8**	50.7	0.1	2.9
National	**28.8**	**3.8**	**0.4**	**4.2**	**4.4**	**0.4**	**0.6**	**0.3**	**6.8**	**47.3**	**0.5**	**2.5**

6.1.3 Agricultural support received

The results presented in Table 16 show evidence of the support to urban agriculture provided by the Government of Zimbabwe. The results show that at national level, the most common form of agricultural support was the provision of free seed (48%), followed by Compound D fertiliser (32.8%), then Ammonium Nitrate fertiliser (18.2%) and lastly, pesticides (1%). Matabeleland North received the most support in terms of seed (75%) and pesticides (8%). Surveyed households in Midlands received the highest support in terms of Compound D (38.6%) and Mashonaland Central (26.5%) received the highest support in terms of Ammonium Nitrate.

The results presented in this section show the Government's commitment to ensuring food security to all households in Zimbabwe. In the previous years, agricultural support was mainly provided to the rural households, but in line with NDS1, the Government has made it a policy to support urban agriculture as the Government is "leaving no one and no place behind' in transforming Zimbabwe into an Upper Middle-Income Economy. In the last few years, urban agriculture has assumed a new image from small vegetable gardens to a strong safety net for food and nutrition security and income source for urban families. Most urban agriculture plots have become a production hub where maize is grown to supplement household food security.

Besides the provision of agricultural inputs, the Government has also created a conducive environment for urban agriculture through implementation of policies that promote and safeguard urban agriculture. For instance, the Bulawayo City Council approved Urban Agriculture Policy Guidelines for the City in 2000 with a view to alleviate poverty, reduce destitution and improve the nutritional status of the vulnerable groups in the urban community.

Table 16: *Support for agricultural production received by urban households*

Province	Inputs received			
	Seed (%)	Compound D (%)	Ammonium Nitrate (%)	Pesticide (%)
Bulawayo	61.5	23.6	13.5	1.4
Manicaland	53.0	29.0	17.1	0.9
Mash Central	47.0	25.2	**26.5**	1.3
Mash East	46.7	36.6	16.0	0.7
Mash West	40.3	37.9	21.0	0.8
Mat North	**75.0**	8.3	8.3	**8.3**
Midlands	46.1	**38.6**	15.3	0.0
Masvingo	55.6	30.6	12.9	0.8
Harare	38.2	36.6	22.5	2.6
National	**48.0**	**32.8**	**18.2**	**1.0**

6.1.4 Barriers to Urban Agriculture

Although urban agriculture is gaining momentum as shown in Table 14 there as some few barriers impeding its success. These barriers are shown in Table 17 and the main barrier highlighted was no access to land (71.7%) followed by lack of interest (7.5%). The least

reported barrier was late onset of the rains (0.6%). Findings in Table 16 point to the need to provide agricultural land to urban areas if available.

Table 17: *Barriers to urban agriculture*

Province	Reasons not practicing Agriculture							
	No access to land (%)	Viability (%)	Lack of time (%)	Not interested (%)	Late onset of the rains (%)	Council by-laws (%)	Lack of inputs (%)	Other (%)
Bulawayo	66.6	4.3	8.9	9.8	0.7	1.8	1.1	6.7
Manicaland	**85.6**	0.2	1.3	2.3	0.0	3.4	5.1	2.1
Mash Central	74.6	1.5	4.6	6.5	0.0	1.0	**7.8**	4.0
Mash East	75.2	3.2	7.5	6.8	0.3	0.7	2.6	3.7
Mash West	68.4	2.7	3.9	8.9	0.1	2.0	5.5	8.4
Mat North	69.7	**7.0**	9.9	5.8	0.0	3.5	1.2	3.0
Mat South	69.7	1.8	3.8	**10.3**	**3.9**	**6.8**	0.5	3.3
Midlands	74.6	3.2	4.3	4.9	0.0	0.3	2.8	**9.9**
Masvingo	67.7	4.0	**12.2**	7.1	1.9	0.7	2.9	3.5
Harare	73.1	2.4	4.4	7.8	0.2	3.8	5.3	3.1
National	**71.7**	**3.1**	**6.1**	**7.5**	**0.6**	**2.6**	**3.6**	**4.9**

6.2 Inferential analysis

The results presented in Table 18 show that households that are more likely to practise urban agriculture have the following characteristics: headed by female household heads, have low income, household head has a chronic condition, larger household size, households are located in Bulawayo, Manicaland, Mashonaland Central, Mashonaland West, Midlands, and Masvingo provinces. Increasing the age of household head by one year increased the likelihood of the households practising urban agriculture by 0.48% at the 1% level of significance. Similarly, at the 1% level of significance, households with heads with chronic conditions had a 3.33% probability of practising urban agriculture while large sized households had a 1.54% likelihood of engaging in urban agriculture as compared to smaller size households, *ceteris paribus*. Except for households in Matabeleland South, households in all other provinces had an increased likelihood of practising urban agriculture. For example, at the 1% level of significance and *ceteris paribus*, households in Mashonaland East, Manicaland and Midlands provinces has a 34.2%, 21% and 13.6% likelihood of practising urban agriculture, respectively.

Table 18: *Determinants of households practising urban agriculture*

VARIABLES	OLS Urban agriculture	Probit Urban agriculture	Logit Urban agriculture
Household head is female	-0.00713	-0.0383	-0.0592
	(0.0101)	(0.0415)	(0.0725)
Household head age [Years]	0.00486***	0.0174***	0.0296***
	(0.000332)	(0.00116)	(0.00199)
Married living apart	-0.0212	-0.0698	-0.116
	(0.0137)	(0.0516)	(0.0893)
Divorced/Separated	-0.0242*	-0.0878	-0.150
	(0.0134)	(0.0549)	(0.0965)
Widow/widower	0.0133	0.0408	0.0669
	(0.0151)	(0.0535)	(0.0921)
Cohabiting	-0.00824	-0.0520	-0.122
	(0.0321)	(0.164)	(0.300)
Never married	-0.0306**	-0.173**	-0.340***
	(0.0137)	(0.0698)	(0.129)
Household does not have any disability	0.0316**	0.111**	0.194**
	(0.0136)	(0.0465)	(0.0803)
Household head is chronically ill	0.0333***	0.115***	0.197***
	(0.0105)	(0.0349)	(0.0597)
Household size	0.0154***	0.0569***	0.0951***
	(0.00207)	(0.00711)	(0.0121)
Number of orphaned members	0.00605	0.0179	0.0281
	(0.0181)	(0.0574)	(0.0970)
Protestant	0.00935	0.0328	0.0502
	(0.0150)	(0.0528)	(0.0909)
Pentecostal	-0.00225	-0.00357	-0.0119
	(0.0131)	(0.0478)	(0.0830)
Apostolic sect	0.0145	0.0565	0.0939
	(0.0135)	(0.0492)	(0.0853)
Zion	0.00742	0.0285	0.0480
	(0.0187)	(0.0724)	(0.126)
Other Christian	0.00963	0.0309	0.0566
	(0.0184)	(0.0668)	(0.115)
Islam	0.0634	0.172	0.307
	(0.0445)	(0.137)	(0.228)
Traditional	-0.0745**	-0.270	-0.553*
	(0.0357)	(0.178)	(0.325)
Other religion	-0.0230	-0.0666	-0.165
	(0.0309)	(0.126)	(0.225)
No religion	-0.0168	-0.0813	-0.140
	(0.0165)	(0.0672)	(0.118)
Bulawayo	0.0924***	0.366***	0.645***
	(0.0115)	(0.0431)	(0.0763)
Manicaland	0.210***	0.727***	1.251***
	(0.0184)	(0.0563)	(0.0963)
Mash Central	0.180***	0.638***	1.112***
	(0.0178)	(0.0568)	(0.0969)
Mash East	0.342***	1.106***	1.880***
	(0.0164)	(0.0494)	(0.0837)
Mash West	0.0569***	0.244***	0.437***
	(0.0127)	(0.0505)	(0.0901)
Mat North	0.0115	0.0423	0.0616
	(0.0137)	(0.0672)	(0.125)

Mat South	-0.103***	-0.917***	-1.885***
	(0.00870)	(0.109)	(0.252)
Midlands	0.136***	0.517***	0.899***
	(0.0130)	(0.0463)	(0.0813)
Masvingo	0.0713***	0.299***	0.532***
	(0.0128)	(0.0507)	(0.0901)
Income	0.00517**	0.0235**	0.0398**
	(0.00249)	(0.00971)	(0.0172)
Constant	-0.237***	-2.542***	-4.306***
	(0.0380)	(0.149)	(0.262)
Observations	13,222	13,222	13,222
R-squared	0.108		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7. Nutrition

7.1 Household Dietary Diversity

Household dietary diversity can be described as the number of food groups consumed by a household. The recall period is usually the last 24 hours and is a measure of household food access. Twelve food groups were used in this survey. **Figure 6** presents household dietary diversity for urban households by province. Nationally, out 12 food groups about 3% of the households consumed 0-2 food groups and 13% consumed 3-4 food groups. The majority of the households were consuming more than 4 food groups. Across all provinces, more than 50% of the households were consuming 6-12 food groups.

Figure 6: *Household Dietary Diversity by Province*

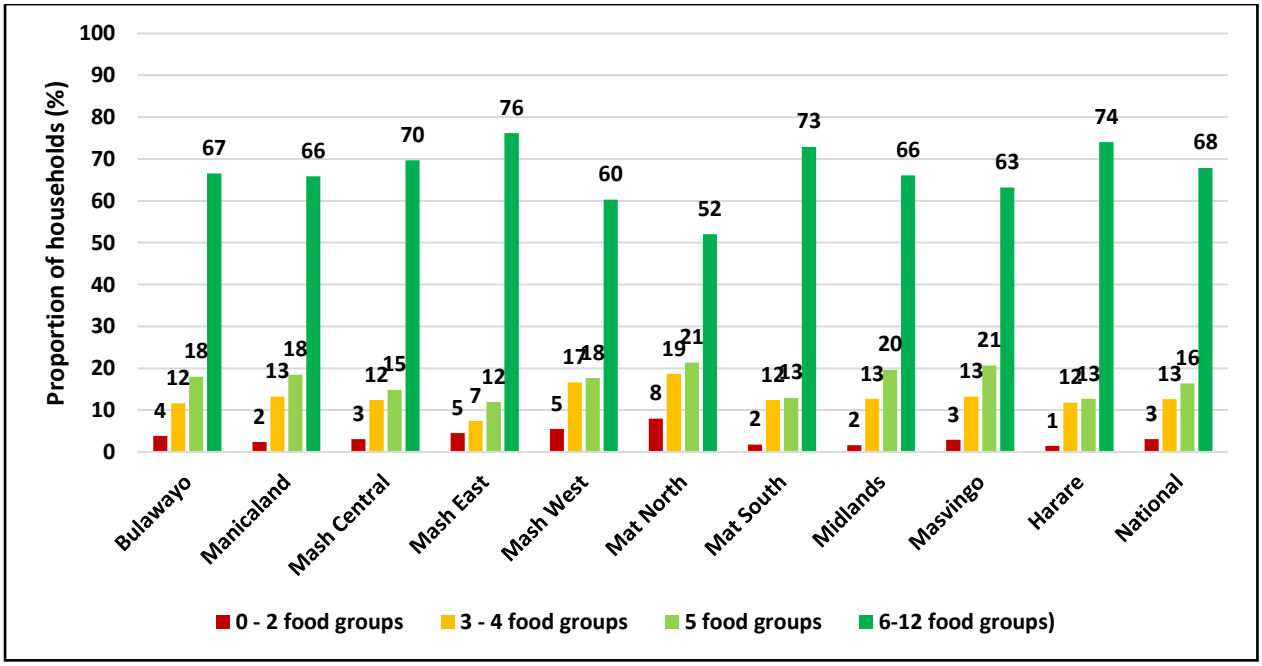


Table 19 presents household dietary diversity by domain. Apart from Binga-Lupane (41%), Bulawayo North (43%), Victoria Falls (43%) and Harare South (49%), more than 50% of households in urban areas were consuming 6-12 food groups. Households in Binga-Lupane

(18%), Ruwa-Domboshava-Goromonzi (17%), Nketa-Emganwini (16%) and Rutenga-Neshuro-Ngundu (12) had households consuming 0-2 food groups. Quality of diets of these households was likely to be compromised and may affect their nutrition outcomes.

Table 19: *Household Dietary Diversity by Domain*

Domain	0 - 2 food groups (%)	3 - 4 food groups (%)	5 food groups (%)	6-12 food groups (%)	Domain	0 - 2 food groups (%)	3 - 4 food groups (%)	5 food groups (%)	6-12 food groups (%)
Bulawayo North	5	25	27	43	Beitbridge Urban	1	16	13	69
Emakhandeni	2	16	14	68	Gwanda Urban	4	11	8	78
Luveve	1	7	18	74	Plumtree	0	10	18	71
Magwegwe-Pumula	1	10	24	64	Kwekwe Urban	6	12	22	60
Lobengula	2	4	9	85	Gweru Urban	1	17	32	50
Nketa-Emganwini	16	9	14	61	Mvuma - Lalapansi		4	12	84
Nkulumane-Tshabalala-Sizinda	1	10	20	70	Zvishavane Urban	0	3	10	86
Mutare Urban	2	13	19	66	Gokwe Centre, Nembudziya	1	21	16	62
Rusape	0	8	16	76	Redcliffe	1	19	25	55
Chipinge, Chimanimani	5	19	21	55	Masvingo Urban	1	9	18	72
Bindura Urban	0	5	10	85	Gutu-Bikita		6	16	78
Mazowe, Mvurwi	9	22	14	55	Chiredzi Urban	0	18	30	52
Mt. Drawin, Shamva	0	11	21	68	Rutenga-Neshuro-Ngundu	12	21	13	55
Marondera Urban	0	8	22	70	Zaka	2	12	26	60
Murehwa-Mutoko-Mudzi		6	15	78	Harare South	6	27	19	49
Chivhu	0	2	4	93	Greater Harare 1		2	8	90
Ruwa-Domboshava-Goromonzi	17	13	6	63	Greater Harare 2	1	8	6	85
Kadoma Urban	11	9	16	64	Greater Harare 3	0	10	12	78
Chegutu Urban	2	15	21	62	Greater Harare 4	1	10	12	78
Chinhoyi Urban	1	25	23	51	Epworth		7	15	78
Kariba-Karoi	11	18	12	58	Chitungwiza-Seke		7	17	76
Norton	2	15	17	66	Chitungwiza-Zengeza	1	10	8	81
Hwange	0	10	18	72	Chitungwiza - St. Mary's	3	24	22	51
Binga-Lupane	18	21	19	41	Caledonia	2	19	14	66
Victoria-Falls	6	25	27	43	Hatcliffe	1	7	9	83

Table 20 presents the household consumption of Vitamin A-rich, Protein-rich and Haem Iron-rich by province. Consumption of these essential food elements can improve nutrition and health outcomes. Nationally, about 78.2% of urban households consumed vitamin A rich foods 7 days prior to the survey. The consumption of protein rich and iron rich foods was low across all provinces.

Table 20: *Household Consumption of Vitamin A-rich, Protein-rich and Haem Iron-rich foods by Province*

Province	Consumption of vitamin A-rich foods			Consumption of protein-rich foods			Consumption of haem iron-rich foods		
	0 days (%)	1-6 days (%)	7 days (%)	0 days (%)	1-6 days (%)	7 days (%)	0 days (%)	1-6 days (%)	7 days (%)
Bulawayo	0.4	21.1	78.5	1.0	54.4	44.6	1.8	82.7	15.5
Manicaland	0.1	13.9	85.9	0.4	55.9	43.7	1.0	88.1	10.9
Mashonaland Central	0.4	21.6	78.0	0.3	49.8	49.9	1.1	81.1	17.8
Mashonaland East	0.1	15.6	84.3	0.2	46.9	52.9	0.5	83.9	15.6
Mashonaland West	0.3	28.9	70.8	0.9	61.7	37.4	0.6	85.9	13.5
Matabeleland North	1.2	43.1	55.7	0.6	55.5	43.9	0.2	83.0	16.8
Matabeleland South	0.1	23.5	76.4	1.0	42.4	56.6	1.6	79.3	19.1
Midlands	0.7	18.7	80.6	1.3	57.7	41.0	1.3	81.0	17.7
Masvingo	0.3	35.7	64.0	0.3	59.9	39.7	0.8	84.9	14.3
Harare	0.3	13.7	86.0	0.5	49.4	50.1	1.0	84.7	14.3
National	**0.4**	**21.4**	**78.2**	**0.7**	**53.3**	**46.0**	**1.1**	**83.6**	**15.3**

7.2. Women Dietary Diversity

Table 21 presents foods consumed by women of child bearing age 24 hours prior to the survey. Generally, women consumed cereals and vegetables. The consumption of meat, dairy and eggs was low across provinces.

Table 21: *Foods Consumed by Women of Child Bearing Age*

Province	Grains, white roots and tubers (%)	Pulses (%)	Nuts and seeds (%)	Dairy (%)	Eggs (%)	Meat, poultry and fish (%)	Dark green leafy vegetables (%)	Other vitamin A-rich fruits and vegetables (%)	Other fruits (%)	Other vegetables (%)
Bulawayo	59.0	4.4	1.0	10.0	6.0	22.0	39.1	24.0	7.8	30.4
Manicaland	67.1	9.6	1.5	11.2	11.5	24.8	58.0	35.6	12.4	43.1
Mash Central	63.6	8.8	2.6	12.0	15.0	29.9	50.7	30.9	13.8	45.2
Mash East	73.4	13.6	6.5	22.2	21.9	34.1	55.3	44.2	21.7	49.7
Mash West	71.9	5.9	2.3	7.1	8.3	18.8	51.7	30.5	9.9	41.5
Mat North	59.3	9.7	1.2	7.6	6.4	24.2	45.8	17.8	7.2	24.9
Mat South	72.4	6.3	1.2	15.3	10.8	31.3	49.9	19.9	17.2	47.3
Midlands	67.3	5.5	3.4	14.7	6.7	25.9	47.1	27.4	9.7	38.0

Masvingo	71.7	4.9	2.6	14.3	7.2	30.9	48.0	22.4	13.7	45.4
Harare	63.0	9.8	3.0	9.7	11.6	25.4	49.3	29.9	11.4	39.2
National	**65.9**	**7.7**	**2.6**	**11.8**	**10.1**	**26.0**	**48.4**	**28.3**	**11.8**	**39.5**

Table 22 presents dietary diversity of women of child bearing age by province. Nationally, about 26% of the women of child bearing age were consuming less than 3 food groups. At least 74% of the women were consuming 3 or more food groups.

Table 22: *Women of Child Bearing Age Dietary Diversity by Province*

Province	0 - 2 food groups (%)	3 - 4 food groups (%)	5 -10 food groups (%)
Bulawayo	34	45	21
Manicaland	20	49	31
Mash Central	23	34	43
Mash East	16	37	46
Mash West	29	51	20
Mat North	37	38	25
Mat South	28	40	32
Midlands	29	45	26
Masvingo	24	54	22
Harare	22	46	31
National	**26**	**45**	**29**

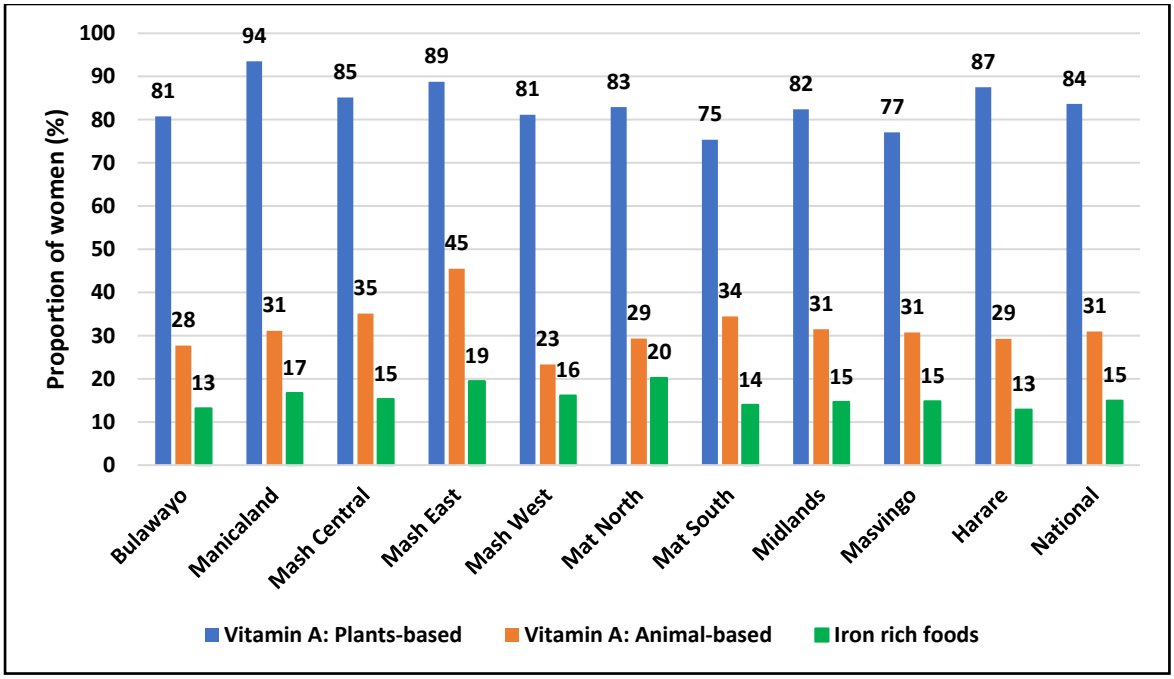
Table 23 presents dietary diversity of women of child bearing age by domain. The majority of the women of child bearing age were consuming more than 3 food groups across domains. It is worrisome that women of child bearing age in domains like Redcliffe (66%), Bulawayo North (63%), Hatcliffe (55%), Victoria Falls (55%), Kwekwe (53%) and Chipinge-Chimanimani (50%) were consuming less than 3 food groups.

Table 23: *Women of Child Bearing Age Dietary Diversity by Domain*

Domain	Women Dietary Diversity			Domain	Women Dietary Diversity		
	0 - 2 food groups (%)	3 - 4 food groups (%)	5 -10 food groups (%)		0 - 2 food groups (%)	3 - 4 food groups (%)	5 -10 food groups (%)
Bulawayo North	63	36	2	Beitbridge Urban	39	36	25
Emakhandeni	43	46	11	Gwanda Urban	20	44	36
Luveve	11	45	45	Plumtree	25	39	36
Magwegwe-Pumula	19	62	19	Kwekwe Urban	53	35	12
Lobengula	30	53	17	Gweru Urban	30	56	13
Nketa-Emganwini	42	35	22	Mvuma - Lalapansi	11	54	35
Nkulumane-Tshabalala-Sizinda	17	46	37	Zvishavane Urban	5	45	51
Mutare Urban	9	55	36	Gokwe Centre, Nembudziya	18	48	34
Rusape	8	49	43	Redcliffe	66	34	1
Chipinge, Chimanimani	50	42	8	Masvingo Urban	10	55	35
Bindura Urban	4	17	79	Gutu-Bikita	27	65	8
Mazowe, Mvurwi	18	48	34	Chiredzi Urban	24	61	15
Mt. Drawin, Shamva	40	38	22	Rutenga-Neshuro-Ngundu	25	31	45
Marondera Urban	11	62	27	Zaka	31	53	15
Murehwa-Mutoko-Mudzi	12	45	43	Harare South	33	55	12
Chivhu	7	33	61	Greater Harare 1	17	45	38
Ruwa-Domboshava-Goromonzi	34	12	55	Greater Harare 2	6	36	58
Kadoma Urban	9	50	41	Greater Harare 3	6	54	40
Chegutu Urban	15	58	26	Greater Harare 4	10	39	52
Chinhoyi Urban	30	59	11	Epworth	23	49	28
Kariba-Karoi	43	44	13	Chitungwiza-Seke	7	50	43
Norton	46	44	10	Chitungwiza-Zengeza	32	38	30
Hwange	29	40	31	Chitungwiza - St. Mary's	29	60	11
Binga-Lupane	30	42	28	Caledonia	18	40	43
Victoria-Falls	55	31	14	Hatcliffe	55	40	5

Figure 7 presents women of child bearing age's consumption of protein, iron and vitamin A rich foods by Province. Nationally, 84% of the women consumed plant-based vitamin A, 31% consumed animal-based vitamin A and 15% consumed iron rich foods. Across provinces, the proportions of urban women consuming animal-based vitamin A and iron rich foods were low.

Figure 7: *Women of Child Bearing Age Consumption of Protein, Iron and Vitamin A-Rich Foods by Province*



7.3 Child and Adolescent Nutrition Status

In this section the descriptive and inferential analyses are presented. All forms of childhood malnutrition remain the world's most fundamental challenges for improved human development (WHO, 2015). Stunting is a complex biological indicator but it is one that uniquely captures the deep-rooted causes of childhood malnutrition. It reflects the persistent poverty and repeated insults to the growing child. Stunting is related to many factors, including socioeconomic status, dietary intake, water sanitation and hygiene, infections, maternal nutritional status, micronutrient deficiencies and the environment. A low family income and poor living conditions increase the risk of child stunting for many reasons such as increased food insecurity, low access to health care, unhealthy environments and a high risk of infections.

A multi sectoral approach is therefore the most effective measure to address stunting. Stunting is a commonly used indicator that reflects larger structural and interrelated issues related to the lack of access to adequate food and nutrient intake as well as poor health conditions. On a population basis, high levels of stunting are associated with poor socioeconomic conditions and increased risk of frequent and early exposure to adverse conditions such as illness and/or inappropriate feeding practices. Similarly, a decrease in the national stunting rate is usually indicative of improvements in overall socioeconomic conditions of a country.

7.3.1 Child Nutrition 6 to 59 Months: Descriptive Analysis

Table 24 presents the national prevalence of stunting, wasting and underweight by gender. The results revealed high stunting prevalence of 23%, underweight was at 6.9%, wasting 2.9% and obesity 0.1%. Stunting was higher in boys (25.0%) than girls (21.0%). Underweight prevalence was also higher in boys (7.7%) than girls (6.1%). Conversely, wasting was higher in girls (3.1%) than boys (2.8%).

Table 24: *Anthropometric variables: national prevalence of stunting, wasting and underweight by gender*

		Boys	Girls	Total
Stunted	n	2699	2625	5324
	%	25.0	21.0	23.0
Underweight	n	2699	2625	5324
	%	7.7	6.1	6.9
Wasted	n	2668	2580	5248
	%	2.8	3.1	2.9
Overweight	n	2668	2580	5248
	%	3.3	2.8	3.0
Obese	n	2668	2580	5248
	%	0.1	0.0	0.1

Table 25 presents the national prevalence of stunting, wasting and underweight by province. Stunting was higher than the national average in Mashonaland West (26.7%) followed by Harare (25.9%) and Matabeleland South (25.1%). Underweight prevalence was higher in Harare (8.4%) and Matabeleland South (8.4%) and Mashonaland Central (8.0%).

Table 25: *Prevalence of stunting and underweight by Province*

Province	N	Severe stunting (%)	Moderate stunting (%)	Stunted (%)	Severe Underweight (%)	Moderate Underweight (%)	Underweight (%)
Bulawayo	**781**	5.1	17.8	22.9	0.5	4.1	4.6
Manicaland	**272**	7.0	14.3	21.3	0.0	7.4	7.4
Mash Central	**274**	6.9	13.9	20.8	0.7	7.3	8.0
Mash East	**415**	6.0	16.6	22.7	0.2	5.5	5.8
Mash West	**393**	6.9	19.8	26.7	0.5	6.6	7.1
Mat North	**183**	9.3	12.6	21.9	0.5	4.9	5.5
Mat South	**334**	6.3	18.9	25.1	0.6	7.8	8.4
Midlands	**616**	3.9	16.4	20.3	0.5	6.2	6.7
Masvingo	**428**	4.0	10.5	14.5	1.2	4.2	5.4
Harare	**1628**	6.7	19.2	25.9	0.7	7.6	8.4
National	**5324**	6.0	17.1	23.0	0.6	6.3	6.9

Table 26 presents the national prevalence of wasting and overweight by province. Wasting was higher than national average in Manicaland (6.6%) followed by Midlands (4.1%) and Mashonaland East (3.4%). Overweight and obesity prevalence was higher in Matabeleland North (7.1%) followed by Masvingo (4.5%) and Mashonaland West (3.9%).

Table 26: *Prevalence of Wasting by Province*

		Severe wasting (%)	Moderate wasting (%)	Total Wasted (%)	Possible risk of overweight (%)	Overweight (%)	Obesity (%)	Overweight and Obesity (%)
Bulawayo	**769**	0.0	2.5	2.5	15.5	3.6	0.0	3.6
Manicaland	**271**	0.0	6.6	6.6	14.0	1.8	0.0	1.8
Mash Central	**268**	0.0	2.6	2.6	13.8	1.5	0.4	1.9
Mash East	**413**	0.2	3.1	3.4	16.0	2.7	0.2	2.9
Mash West	**386**	0.3	2.6	2.8	17.1	3.9	0.0	3.9
Mat North	**182**	0.0	1.1	1.1	16.5	7.1	0.0	7.1
Mat South	**328**	0.0	2.1	2.1	12.5	1.8	0.0	1.8
Midlands	**611**	0.0	4.1	4.1	14.6	3.3	0.2	3.4
Masvingo	**422**	0.2	2.6	2.8	14.5	4.3	0.2	4.5
Harare	**1598**	0.0	2.4	2.4	14.5	2.4	0.1	2.4
National	**5248**	**0.1**	**2.9**	**2.9**	**14.8**	**3.0**	**0.1**	**3.1**

8.3.1 Inferential Analysis

The results in Column (I) of **Table 27** show that never married household heads, household heads with a chronic condition and larger household sizes are positively associated with increased incidences of stunting, all things being equal. The column also shows that an increase in income of 1% is associated with a decline in the probability that the household has a stunted child of 2.34%. This finding is consistent with empirical studies that find increases in income to be associated with a decline in stunting rates both across and within countries.[31],[32],[33]. The regional dummies show that in comparison to the base province of Harare, save for Mashonaland West and Matabeleland South provinces, all the other provinces are associated with a statistically significant decline in stunting, ceteris paribus.

The results in Column (II) of the table show that in comparison to being married and living with spouses, being married and living apart from the spouse is associated with a decline in the probability that the household has an underweight child by 4.5% at the 1% level of significance all things being held constant. Furthermore, expectedly, households that are led by heads with chronic conditions are likely to have an underweight child. Compared to the base province of Harare, Bulawayo, Mashonaland East, Matabeleland North and Masvingo provinces have statistically significant lower probabilities of having a household with an underweight child after controlling for observed confounders.

The results in Column (III) show that in comparison to being married and living with spouses, being married and living apart from the spouse is associated with a decline in the probability that the household has an underweight child by 2.31% at the 1% level of significance, all things being held constant. Interestingly, in comparison to the base religion of Catholicism, following the traditional religion is associated with a decline in the probability that the household has a wasted child of 3.45% with a 99% level of confidence after controlling for observed confounders.

[31] Baye K, Laillou A, Chitweke S. Socio-Economic Inequalities in Child Stunting Reduction in Sub-Saharan Africa. Nutrients. 2020 Jan 18;12(1):253. doi: 10.3390/nu12010253. PMID: 31963768; PMCID: PMC7019538.

[32] da Silva ICM, França GV, Barros AJD, Amouzou A, Krasevec J, Victora CG. Socioeconomic Inequalities Persist Despite Declining Stunting Prevalence in Low- and Middle-Income Countries. J Nutr. 2018 Feb 1;148(2):254-258. doi: 10.1093/jn/nxx050. PMID: 29490104; PMCID: PMC6084584.

[33] Flores-Quispe MDP, Restrepo-Méndez MC, Maia MFS, Ferreira LZ, Wehrmeister FC. Trends in socioeconomic inequalities in stunting prevalence in Latin America and the Caribbean countries: differences between quintiles and deciles. Int J Equity Health. 2019 Oct 15;18(1):156. doi: 10.1186/s12939-019-1046-7. PMID: 31615530; PMCID: PMC6794733.

Column (IV) of the table shows that an increase in the household size increases whilst the proportion of orphaned children in the household decreases the possibility that the household has an under 5 child that is overweight/obese after controlling for observed confounders. We observe that in comparison to Catholicism religion, traditional religion reduces the probability that the household has an overweight/obese child by 2.68% at the 5% level of significance after controlling for observed confounders. In comparison to the base province of Harare, Matabeleland North and Masvingo provinces have statistically significant higher probability of having households with overweight/obese under 5 children ceteris paribus.

Table 27: *Inferential analysis of Children 0 to 59 Months Nutrition Status*

VARIABLES	(1) Stunting	(2) Underweight	(3) Wasting	(4) Obese/Over weight
Household head is female	0.00418	0.0168	0.000366	-0.00190
	(0.0254)	(0.0146)	(0.00832)	(0.00940)
Household head age [Years]	-0.000196	-0.000490	-0.000363	-0.000329
	(0.000797)	(0.000517)	(0.000296)	(0.000285)
Married living apart	0.0208	-0.0450***	-0.0231***	-0.00997
	(0.0325)	(0.0147)	(0.00872)	(0.0105)
Divorced/Separated	-0.0116	0.00878	0.00183	0.00118
	(0.0337)	(0.0215)	(0.0132)	(0.0135)
Widow/Widower	-0.0107	-0.00826	-0.00731	-0.0127
	(0.0367)	(0.0221)	(0.0129)	(0.0124)
Cohabiting	0.101	0.0586	0.00434	0.0352
	(0.0903)	(0.0614)	(0.0330)	(0.0472)
Never married	0.103**	0.00159	-0.0128	0.00992
	(0.0487)	(0.0294)	(0.0137)	(0.0194)
Household head does not have any disability	0.00128	-0.000889	-0.0108	-0.0150
	(0.0294)	(0.0197)	(0.0126)	(0.0134)
Household head is chronically ill	0.0519**	0.0385**	0.00574	0.00499
	(0.0246)	(0.0166)	(0.00870)	(0.00930)
Household size	0.0112**	0.00254	0.00222	0.00312*
	(0.00454)	(0.00267)	(0.00157)	(0.00161)
Number of orphaned members	0.0197	0.0183	0.0113	-0.0174***
	(0.0345)	(0.0206)	(0.0143)	(0.00658)
Protestant	-0.0242	-0.0171	0.00461	0.00464
	(0.0324)	(0.0193)	(0.0137)	(0.0124)
Pentecostal	-0.0242	-0.00152	0.000425	0.00329
	(0.0291)	(0.0180)	(0.0123)	(0.0112)
Apostolic sect	0.0477	0.000142	-0.00415	0.00273
	(0.0301)	(0.0183)	(0.0123)	(0.0110)
Zion	0.0767*	0.0346	0.00483	0.0125
	(0.0399)	(0.0256)	(0.0162)	(0.0168)
Other Christian	-0.0274	-0.0223	0.00942	0.00340
	(0.0399)	(0.0230)	(0.0174)	(0.0161)
Islam	-0.0331	-0.0158	0.000760	0.0408
	(0.0836)	(0.0502)	(0.0357)	(0.0489)
Traditional	0.0562	-0.0565	-0.0345***	-0.0268**
	(0.108)	(0.0479)	(0.0117)	(0.0106)
Other religion	-0.0164	0.0449	-0.00509	0.0923
	(0.0739)	(0.0544)	(0.0268)	(0.0620)

No religion	0.0315	-0.0177	-0.00615	-0.00862
	(0.0417)	(0.0234)	(0.0154)	(0.0141)
Bulawayo	-0.0517**	-0.0489***	0.00173	0.0131
	(0.0233)	(0.0129)	(0.00845)	(0.00982)
Manicaland	-0.0696**	-0.0103	0.0488***	-0.00858
	(0.0336)	(0.0204)	(0.0184)	(0.0105)
Mash Central	-0.0718**	-0.00281	0.00231	-0.00684
	(0.0349)	(0.0224)	(0.0121)	(0.0105)
Mash East	-0.0554**	-0.0280*	0.0128	0.00627
	(0.0275)	(0.0155)	(0.0109)	(0.0104)
Mash West	-0.0156	-0.0167	0.00318	0.0125
	(0.0290)	(0.0171)	(0.0108)	(0.0124)
Mat North	-0.0906***	-0.0451**	-0.0143	0.0514**
	(0.0351)	(0.0191)	(0.00987)	(0.0209)
Mat South	-0.0423	-0.00724	-0.00226	-0.0128
	(0.0310)	(0.0198)	(0.0103)	(0.00896)
Midlands	-0.0914***	-0.0214	0.0203*	0.0114
	(0.0245)	(0.0151)	(0.0104)	(0.00963)
Masvingo	-0.144***	-0.0366**	0.00377	0.0221*
	(0.0248)	(0.0153)	(0.0105)	(0.0127)
Income	-0.0234***	-0.00349	0.00191	0.00269
	(0.00489)	(0.00349)	(0.00155)	(0.00168)
Constant	0.525***	0.143***	0.0195	0.00517
	(0.0764)	(0.0526)	(0.0284)	(0.0269)
Observations	4,569	4,569	4,569	4,569
R-squared	0.024	0.012	0.008	0.010

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7.4 Child Nutrition 6 to 9 Years

7.4.1 Descriptive analysis

Table 28 presents the national prevalence of stunting, wasting and underweight by gender. The results revealed high stunting prevalence of 10.0% and underweight was at 10.5%. Stunting was marginally higher in boys (10.7%) than girls (9.2%), even underweight prevalence was also higher in boys (11.1%) than girls (9.8%).

Table 28: *Stunting, wasting and underweight by gender*

	Males	Females	Total
Severe stunting	1247 3.1	1235 2.4	2482 2.8
Moderate Stunting	1247 7.5	1235 6.8	2482 7.2
Stunted	1247 10.7	1235 9.2	2482 10.0
Severe Underweight	1283 3.4	1277 2.7	2560 3.1
Moderate Underweight	1283 7.7	1277 7.0	2560 7.4
Total Underweight	1283 11.1	1277 9.8	2560 10.5

Table 29 presents the national prevalence of stunting and underweight children 6 to 9 years by province. Stunting was higher in Manicaland (28.4%), Mashonaland West (16.8%) and Matabeleland North (14.5%). Underweight prevalence was higher in Mashonaland West (29.0%) and Manicaland (22.0%).

Table 29: *Stunting and underweight children 6 to 9 years by province*

	n	Severe Stunting (%)	Moderate Stunting (%)	Stunting (%)	n	Severe Underweight (%)	Moderate Underweight (%)	Underweight (%)
Bulawayo	455	1.3	5.5	6.8	466	0.9	7.3	8.2
Manicaland	169	11.2	17.2	28.4	173	12.1	9.8	22.0
Mash Central	104	1.0	4.8	5.8	112	0.9	6.3	7.1
Mash East	253	1.6	5.9	7.5	258	1.6	7.4	8.9
Mash West	125	8.0	8.8	16.8	145	15.9	13.1	29.0
Mat North	62	8.1	6.5	14.5	62	1.6	3.2	4.8
Mat South	104	0.0	4.8	4.8	108	1.9	3.7	5.6
Midlands	191	0.0	3.1	3.1	195	1.0	5.6	6.7
Masvingo	124	1.6	4.0	5.6	127	1.6	2.4	3.9
Harare	895	2.5	8.2	10.6	914	2.1	8.0	10.1
National	2482	2.8	7.2	10.0	2560	3.1	7.4	10.5

Table 30 presents the national prevalence of thinness and overweight in children 6-9 years by province. The results revealed thinness prevalence of 4.8%, overweight 9.3% and obesity 6.1%. Thinness was higher in Mashonaland West (13.3%) followed by Mashonaland East (8.1%). Overweight was high in Mashonaland Central (15.9%), Manicaland (14.4%) and Matabeleland North (14.1%). Prevalence of obesity was high in Mashonaland West (20.7%) and Mashonaland Central (9.7%).

Table 30: *Thinness and overweight of children 6-9 years by province*

	N	Severe Thinness (%)	Moderate Thinness (%)	Total Thinness (%)	Overweight (%)	Obese (%)	Obese and Overweight (%)
Bulawayo	466	1.1	4.3	5.4	10.1	5.8	15.9
Manicaland	174	2.3	4.6	6.9	14.4	7.5	21.8
Mashonaland Central	113	0.9	0.9	1.8	15.9	9.7	25.7
Mashonaland East	260	1.9	6.2	8.1	8.1	4.2	12.3
Mashonaland West	150	6.0	7.3	13.3	9.3	20.7	30.0
Matabeleland North	64	1.6	1.6	3.1	14.1	4.7	18.8
Matabeleland South	107	0.9	0.9	1.9	9.3	3.7	13.1
Midlands	197	1.0	3.6	4.6	9.6	5.6	15.2
Masvingo	128	0.8	3.1	3.9	10.9	5.5	16.4
Harare	919	0.3	2.6	2.9	7.0	4.2	11.2
National	2578	1.2	3.6	4.8	9.3	6.1	15.4

7.4.2 Inferential analysis

Column (I) of **Table 31** shows that in comparison to being married and living together with the spouse, being divorced/separated from the spouse or being never married are ceteris paribus associated with a 5.02% and 5.44%, respectively increase in the probability that the household had a stunted child at the 10% level of significance. The table also shows that at the 10% level of significance, an increase in the household size by one member is associated with 0.553% increase in the probability that the household has a stunted child of 5-9 years. Furthermore, consistent with the findings of under 5 children, in comparison to the base religion of Catholicism, practicing traditional religion is ceteris paribus associated with a decline in the probability that the household has a stunted 5-9 year old child by 8.99% at the 1% level of significance. In comparison to the base province of Harare, Manicaland province has a higher probability of having a household with a stunted child whereas, Mashonaland Central, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo have lower probability of having households with stunted children after controlling for observed confounders.

Column (II) of **Table 31** shows that households that practice traditional religion, Pentecostal and Islam have lower probability of having underweight children of 5-9 years in comparison the base religion of Catholicism after controlling for observed confounders. In comparison to the base province of Harare, Manicaland has higher probability of having a household with an underweight 5-9 years child, whereas Mashonaland Central, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces have lower probability after controlling for observed confounders.

Column (III) of the table shows that in comparison to the households that are headed by persons who are married and living together with their spouse, those that are headed by divorced/separated persons have a 3.49% higher probability of having an overweight/obese 5-9 year old child at the 10% level of significance, all things being equal. Furthermore, an increase in income by 1% is associated with a 0.897% increase in the probability that the household has an overweight/obese 5–9-year old child at the 1% level of significance all things being equal. Finally, in comparison to the base province of Harare, Masvingo province has statistically significant lower association with having an overweight/obese 5-9 year child in the household.

Column (IV) of **Table 31** shows that at the 10% level of significance, households that are headed by widowed persons have higher probability of having a thin 5-9 year old child in comparison to those headed by persons married and living with their spouse after controlling for observed confounders. Furthermore, in comparison to the base religion of

Catholicism, those practicing Islam or traditional religion are less likely to have a thin child all things being equal. Finally, in comparison to the base province of Harare, Bulawayo, Manicaland and Mashonaland East provinces have higher probability of having a thin child whereas Mashonaland Central and Masvingo provinces have a lower probability of having a thin child all things being equal.

Table 31: *Inferential analysis: Children 5-9 Years on Nutrition Status*

VARIABLES	(1) Stunting	(2) Underweight	(3) Overweight /obese	(4) Thinness
Household head is female	-0.0134	0.0226	-0.0158	0.00630
	(0.0175)	(0.0178)	(0.0131)	(0.0145)
Household head age [Years]	-9.84e-05	-0.000151	-0.000183	-0.000197
	(0.000469)	(0.000457)	(0.000450)	(0.000388)
Married living apart	0.00774	-0.0239	-0.00527	-0.00467
	(0.0180)	(0.0177)	(0.0173)	(0.0156)
Divorced/Separated	0.0502*	-0.0167	0.0349*	-0.000570
	(0.0266)	(0.0229)	(0.0204)	(0.0174)
Widow/Widower	0.0322	0.0131	0.0280	0.0378*
	(0.0235)	(0.0234)	(0.0205)	(0.0204)
Cohabiting	0.0212	-0.0268	0.0283	0.0954
	(0.0674)	(0.0472)	(0.0644)	(0.0779)
Never married	0.0544*	-0.0111	-0.0138	-0.0154
	(0.0314)	(0.0272)	(0.0232)	(0.0220)
Household head does not have any disability	-0.00220	0.00573	0.0220	0.000723
	(0.0193)	(0.0180)	(0.0185)	(0.0149)
Household head is chronically ill	-0.00465	-0.0183	0.0170	-0.0160
	(0.0143)	(0.0122)	(0.0153)	(0.0104)
Household size	0.00553*	0.00292	-0.000436	-0.00276
	(0.00305)	(0.00278)	(0.00312)	(0.00225)
Number of orphaned members	-0.0100	-0.00277	-0.0132	0.0273
	(0.0215)	(0.0166)	(0.0134)	(0.0203)
Protestant	-0.0303	-0.0305	0.0168	-0.0230
	(0.0233)	(0.0231)	(0.0202)	(0.0193)
Pentecostal	-0.0338	-0.0409**	0.0245	-0.0239
	(0.0212)	(0.0206)	(0.0173)	(0.0171)
Apostolic sect	-0.00907	-0.00149	0.00824	-0.0115
	(0.0220)	(0.0221)	(0.0172)	(0.0179)
Zion	-0.0247	-0.0278	0.0182	-0.0212
	(0.0270)	(0.0250)	(0.0253)	(0.0213)
Other Christian	-0.0352	-0.0355	-0.00945	-0.0122
	(0.0242)	(0.0253)	(0.0215)	(0.0235)
Islam	-0.0380	-0.0845***	0.105	-0.0604***
	(0.0411)	(0.0213)	(0.0915)	(0.0178)
Traditional	-0.0899***	-0.0836***	0.0469	-0.0662***
	(0.0222)	(0.0214)	(0.0769)	(0.0183)
Other religion	-0.0198	-0.0625*	0.0101	-0.0169
	(0.0474)	(0.0322)	(0.0463)	(0.0399)
No religion	0.0172	0.00114	0.0197	-0.0147
	(0.0337)	(0.0313)	(0.0258)	(0.0218)
Bulawayo	-0.0225	-0.0127	0.0204	0.0357***
	(0.0165)	(0.0148)	(0.0162)	(0.0130)
Manicaland	0.0603**	0.0611**	0.0140	0.0534**
	(0.0298)	(0.0310)	(0.0253)	(0.0214)
Mash Central	-0.0731***	-0.0593***	0.0285	-0.0264***
	(0.0162)	(0.0156)	(0.0276)	(0.00908)

Mash East	-0.0179	-0.00986	-0.0103	0.0506***
	(0.0186)	(0.0178)	(0.0179)	(0.0194)
Mash West	-0.0818***	0.00544	0.00733	0.0219
	(0.0146)	(0.0250)	(0.0241)	(0.0189)
Mat North	-0.0591***	-0.0585***	-0.00425	-0.0104
	(0.0209)	(0.0168)	(0.0250)	(0.0149)
Mat South	-0.0746***	-0.0528***	-0.0210	0.000540
	(0.0166)	(0.0169)	(0.0220)	(0.0155)
Midlands	-0.0758***	-0.0540***	-0.0201	-0.0133
	(0.0143)	(0.0147)	(0.0151)	(0.0109)
Masvingo	-0.0813***	-0.0777***	-0.0393***	-0.0246***
	(0.0131)	(0.0111)	(0.0142)	(0.00889)
Income	-0.00250	0.000191	0.00897***	-0.00218
	(0.00349)	(0.00340)	(0.00293)	(0.00301)
Constant	0.119**	0.0892	-0.0644	0.0961**
	(0.0580)	(0.0549)	(0.0477)	(0.0486)
Observations	3,183	3,183	3,183	3,183
R-squared	0.031	0.027	0.012	0.023

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7.5 Adolescent Nutrition

7.5.1 Descriptive analysis

In this section the descriptive and inferential analyses are presented. Adolescence is a period of rapid growth and development, and as such adequate nutrient intake (of both macro and micronutrients) is critical. Consequently, suboptimal nutrition may contribute to delayed and stunted growth as well as impaired development[34]. Literature has shown that malnutrition remains a significant problem for adolescents worldwide, compounded by wrong dietary choices[35].

Table 32 presents the levels of stunting and underweight in children 10-19 years by province. The results revealed stunting prevalence of 13.9% and underweight (9.6%). Stunting prevalence for males (17.5%) was marginally higher than of females (11.0%). Similarly, underweight was high in males (12.2%) compared to females (7.6%).

Table 32: *Stunting and underweight in children 10-19 years by gender*

		Males	Females	Total
Severe Stunting	n	1906	2374	4280
	%	4.2	3.5	3.8
Moderate Stunting	n	1906	2374	4280
	%	13.3	7.5	10.1
Stunting	n	1906	2374	4280

[34] Rehana (2016). Interventions to Improve Adolescent Nutrition: A Systematic Review and Meta-Analysis, Journal of Adolescent Health, 59(4, Supplement,), pp. S29-S39.
[35] Schneider, D., 2000. International trends in adolescent nutrition. Social Science & Medicine, 51(6), pp. 955-967.

	%	17.5	11.0	13.9
Severe Underweight	n	1932	2416	4348
	%	3.4	1.6	2.4
Moderate Underweight	n	1932	2416	4348
	%	8.8	6.0	7.2
Underweight	n	1932	2416	4348
	%	12.2	7.6	9.6

Table 33 presents the national prevalence of stunting and underweight in children 10-19 years by province. Midlands (8.6%), Masvingo (8.4%) and Mashonaland Central (4.7%) had low stunting levels. Underweight was high in Mashonaland West (18.7%), Matabeleland South (11.1%) and Manicaland (10.0%).

Table 33: *Stunting and underweight in children 10-19 years by province*

	N	Severe stunting (%)	Moderate Stunting (%)	Total Stunting (%)	N	Severe Underweight (%)	Moderate Underweight (%)	Total Underweight (%)
Bulawayo	797	5.0	12.3	17.3	799	2.0	7.9	9.9
Manicaland	385	7.0	15.8	22.9	391	2.6	7.4	10.0
Mash Central	236	1.3	3.4	4.7	244	1.2	6.1	7.4
Mash East	387	3.4	11.4	14.7	394	2.8	6.6	9.4
Mash West	298	12.8	13.4	26.2	315	7.9	10.8	18.7
Mat North	158	3.2	10.8	13.9	162	1.2	5.6	6.8
Mat South	159	1.9	8.2	10.1	162	2.5	8.6	11.1
Midlands	454	1.1	7.5	8.6	458	1.3	6.6	7.9
Masvingo	358	1.7	6.7	8.4	361	1.9	5.0	6.9
Harare	1045	2.1	8.8	10.9	1062	1.9	7.3	9.1
National	**4277**	**3.8**	**10.1**	**13.9**	**4348**	**2.4**	**7.2**	**9.6**

Table 34 shows the national prevalence of thinness and overweight/obesity in children 10-19 years by province. Children 10-19 years were generally thin at 78.5%. Severe (1.3%) and moderate (4.2%) thinness was observed in children 10-19 years as well as overweight/obesity of 16.%. The picture is similar across provinces.

Table 34: *Thinness and overweight/obese in children 10-19 years by province*

	N	Severe thinness (%)	Moderate thinness (%)	Thin (%)	Overweight (%)	Obese (%)	Overweight & Obese (%)
Bulawayo	813	0.9	5.3	6.2	12.2	4.8	17
Manicaland	398	2.3	3.8	6.1	15.3	5.8	21.1
Mash Central	245	0.8	5.3	6.1	12.7	6.1	18.8
Mash East	406	2.5	3.2	5.7	11.1	4.4	15.5

Mash West	329	2.4	4.9	7.3	10	7.3	17.3
Mat North	163	0	3.1	3.1	9.2	8.6	17.8
Mat South	164	1.2	3	4.2	7.3	8.5	15.9
Midlands	459	1.1	3.7	4.8	8.9	3.7	12.6
Masvingo	363	0.6	3	3.6	9.6	3.6	13.2
Harare	1075	1.1	4.3	5.4	10.5	4.3	14.8
National	**4415**	**1.3**	**4.2**	**5.5**	**11**	**5.1**	**16**

7.5.2 Inferential analysis

Column (I) of **Table 35** shows that in comparison to being married and living together with the spouse, being divorced/separated from the spouse or being never married are ceteris paribus associated with a 5.02% and 5.44%, respectively increase in the probability that the household had a stunted child at the 10% level of significance. The table also shows that at the 10% level of significance an increase in the household size by one member is associated with a 0.553% increase in the probability that the household has a stunted child of 5-9 years. Furthermore, consistent with the findings of under 5 children, in comparison to the base religion of Catholicism, practicing traditional religion is ceteris paribus associated with a decline in the probability that the household has a stunted 5-9 years child by 8.99% at the 1% level of significance. In comparison to the base province of Harare, Manicaland province has a higher probability of having a household with a stunted child whereas, Mashonaland Central, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo have lower probability of having households with stunted children after controlling for observed confounders.

Column (II) of **Table 35** shows that households that practice traditional religion, Pentecostal and Islam religions have lower probability of having underweight children of 5-9 years in comparison the base religion of Catholicism after controlling for observed confounders. In comparison to the base province of Harare, Manicaland has higher probability of having a household with an underweight 5-9 year old child, whereas Mashonaland Central, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces have lower probability after controlling for observed confounders.

Column (III) of the **Table 35** shows that in comparison to the households that are headed by persons who are married and living together with their spouse, those that are headed by divorced/separated persons have a 3.49% higher probability of having an overweight/obese 5-9 years child at the 10% level of significance, all things being equal. Furthermore, an increase in income by 1% is associated with a 0.897% increase in the probability that the household has an overweight/obese 5-9 year old child at the 1% level of significance all things being equal. Finally, in comparison to the base province of Harare,

Masvingo province has statistically significant lower association with having an overweight/obese 5-9 year old child in the household.

Column (IV) of **Table 35** shows that at the 10% level of significance, households that are headed by widowed persons have higher probability of having a thin 5-9 year old child in comparison to those headed by persons married and living with their spouse, after controlling for observed confounders. Furthermore, in comparison to the base religion of Catholicism, those practicing Islam or traditional religion are less likely to have a thin child all things being equal. Finally, in comparison to the base province of Harare, Bulawayo, Manicaland and Mashonaland East provinces have higher probability of having a thin child whereas Mashonaland Central and Masvingo provinces have a lower probability of having a thin child all things being equal.

***Table 35**: Inferential analysis: Children 10-19 Years on Nutrition*

VARIABLES	(1sss) Stunting	(2) Underweight	(3) Overweight /obese	(4) Thinness
Household head is female	-0.0134	0.0226	-0.0158	0.00630
	(0.0175)	(0.0178)	(0.0131)	(0.0145)
Household head age [Years]	-9.84e-05	-0.000151	-0.000183	-0.000197
	(0.000469)	(0.000457)	(0.000450)	(0.000388)
Married living apart	0.00774	-0.0239	-0.00527	-0.00467
	(0.0180)	(0.0177)	(0.0173)	(0.0156)
Divorced/Separated	0.0502*	-0.0167	0.0349*	-0.000570
	(0.0266)	(0.0229)	(0.0204)	(0.0174)
Widow/Widower	0.0322	0.0131	0.0280	0.0378*
	(0.0235)	(0.0234)	(0.0205)	(0.0204)
Cohabiting	0.0212	-0.0268	0.0283	0.0954
	(0.0674)	(0.0472)	(0.0644)	(0.0779)
Never married	0.0544*	-0.0111	-0.0138	-0.0154
	(0.0314)	(0.0272)	(0.0232)	(0.0220)
Household head does not have any disability	-0.00220	0.00573	0.0220	0.000723
	(0.0193)	(0.0180)	(0.0185)	(0.0149)
Household head is chronically ill	-0.00465	-0.0183	0.0170	-0.0160
	(0.0143)	(0.0122)	(0.0153)	(0.0104)
Household size	0.00553*	0.00292	-0.000436	-0.00276
	(0.00305)	(0.00278)	(0.00312)	(0.00225)
Number of orphaned members	-0.0100	-0.00277	-0.0132	0.0273
	(0.0215)	(0.0166)	(0.0134)	(0.0203)
Protestant	-0.0303	-0.0305	0.0168	-0.0230
	(0.0233)	(0.0231)	(0.0202)	(0.0193)
Pentecostal	-0.0338	-0.0409**	0.0245	-0.0239
	(0.0212)	(0.0206)	(0.0173)	(0.0171)
Apostolic sect	-0.00907	-0.00149	0.00824	-0.0115
	(0.0220)	(0.0221)	(0.0172)	(0.0179)
Zion	-0.0247	-0.0278	0.0182	-0.0212
	(0.0270)	(0.0250)	(0.0253)	(0.0213)
Other Christian	-0.0352	-0.0355	-0.00945	-0.0122
	(0.0242)	(0.0253)	(0.0215)	(0.0235)
Islam	-0.0380	-0.0845***	0.105	-0.0604***

	(0.0411)	(0.0213)	(0.0915)	(0.0178)
Traditional	-0.0899***	-0.0836***	0.0469	-0.0662***
	(0.0222)	(0.0214)	(0.0769)	(0.0183)
Other religion	-0.0198	-0.0625*	0.0101	-0.0169
	(0.0474)	(0.0322)	(0.0463)	(0.0399)
No religion	0.0172	0.00114	0.0197	-0.0147
	(0.0337)	(0.0313)	(0.0258)	(0.0218)
Bulawayo	-0.0225	-0.0127	0.0204	0.0357***
	(0.0165)	(0.0148)	(0.0162)	(0.0130)
Manicaland	0.0603**	0.0611**	0.0140	0.0534**
	(0.0298)	(0.0310)	(0.0253)	(0.0214)
Mash Central	-0.0731***	-0.0593***	0.0285	-0.0264***
	(0.0162)	(0.0156)	(0.0276)	(0.00908)
Mash East	-0.0179	-0.00986	-0.0103	0.0506***
	(0.0186)	(0.0178)	(0.0179)	(0.0194)
Mash West	-0.0818***	0.00544	0.00733	0.0219
	(0.0146)	(0.0250)	(0.0241)	(0.0189)
Mat North	-0.0591***	-0.0585***	-0.00425	-0.0104
	(0.0209)	(0.0168)	(0.0250)	(0.0149)
Mat South	-0.0746***	-0.0528***	-0.0210	0.000540
	(0.0166)	(0.0169)	(0.0220)	(0.0155)
Midlands	-0.0758***	-0.0540***	-0.0201	-0.0133
	(0.0143)	(0.0147)	(0.0151)	(0.0109)
Masvingo	-0.0813***	-0.0777***	-0.0393***	-0.0246***
	(0.0131)	(0.0111)	(0.0142)	(0.00889)
Income	-0.00250	0.000191	0.00897***	-0.00218
	(0.00349)	(0.00340)	(0.00293)	(0.00301)
Constant	0.119**	0.0892	-0.0644	0.0961**
	(0.0580)	(0.0549)	(0.0477)	(0.0486)
Observations	3,183	3,183	3,183	3,183
R-squared	0.031	0.027	0.012	0.023

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Treatments for 0 – 5 years

PSM estimates in **Table 36** shows that all things being equal, households that practice open defecation are ceteris paribus associated with increased probabilities of having stunted children. The finding on open defecation and stunting is consistent with Rahman et al. (2020) who posit that open defecation is significantly associated with stunting among

children in India.[36] A host of other empirical studies confirm the finding in other settings.[37], [38], [39]

The results also show that open defecation is associated with decrease in the probability that the household has wasted or overweight/obese child after controlling for observed confounder. Furthermore, it shows an association of access to improved water with increased probability that the household has an overweight/obese child after controlling for observed confounders. Finally, we observe no statistically significant treatment effects of having a handwashing station on nutritional outcomes of under 5 children. It is worth noting however that the existence of spill overs between treated and untreated households potentially biases the results.[40]

Table 36: *Treatment with WASH*

VARIABLES	(1)ssch_stunting_total	(2) ch_underweight_total	(3sssss) Wasting	(4) Obese/Overweight
r1vs0.imp_water	-0.141	-0.00963	0.0131	0.0241***
	(0.138)	(0.0361)	(0.0119)	(0.00710)
r1vs0.defecation_d1	0.282**	0.0464	-0.0212**	-0.0267***
	(0.125)	(0.0543)	(0.00949)	(0.00626)
r1vs0.handwashingstation	-0.0123	0.00322	0.0119	-

[36] Rahman, Manzoor Ahmad Malik, Shekhar Chauhan, Ratna Patel, Ashish Singh, Anshu Mittal. 2020.Examining the linkage between open defecation and child malnutrition in India, Children and Youth Services Review, Volume 117, https://doi.org/10.1016/j.childyouth.2020.105345

[37] Spears D, Ghosh A, Cumming O. Open defecation and childhood stunting in India: an ecological analysis of new data from 112 districts. PLoS One. 2013 Sep 16;8(9):e73784. doi: 10.1371/journal.pone.0073784. Erratum in: PLoS One. 2013;8(9). doi:10.1371/annotation/9ffcb740-f394-41af-bbbc-800c7cc25ea8. PMID: 24066070; PMCID: PMC3774764.

[38] Rah JH, Cronin AA, Badgaiyan B, Aguayo VM, Coates S, Ahmed S. Household sanitation and personal hygiene practices are associated with child stunting in rural India: a cross-sectional analysis of surveys. BMJ Open. 2015 Feb 12;5(2):e005180. doi: 10.1136/bmjopen-2014-005180. PMID: 25678539; PMCID: PMC4330332.

[39] Sahiledengle B, Petrucka P, Kumie A, Mwanri L, Beressa G, Atlaw D, Tekalegn Y, Zenbaba D, Desta F, Agho KE. Association between water, sanitation and hygiene (WASH) and child undernutrition in Ethiopia: a hierarchical approach. BMC Public Health. 2022 Oct 19;22(1):1943. doi: 10.1186/s12889-022-14309-z. PMID: 36261797; PMCID: PMC9583486.

[40] Miguel, E. and Kremer, M. (2004), Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities. Econometrica, 72: 159-217. https://doi.org/10.1111/j.1468-0262.2004.00481.x

	(0.0208)	(0.0131)	(0.00735)	0.000225 (0.00823)
Observations	4,569	4,569	4,569	4,569

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Social protection

Table 37 shows no statistically significant treatment effects of social protection in the form of Government support or UN/NGO support on nutritional outcomes of under 5 children.

Table 37: *Treatment with Support*

VARIABLES	(1)ss ch_stunting_total	(2ss) ch_underweight_total	(3) ch_wasting_total1	(4) ch_wasting_total2
r1vs0.government	0.00306	0.0225	0.0142	-0.0101
	(0.0452)	(0.0286)	(0.0192)	(0.0146)
r1vs0.un_ngo	-0.00875	0.00613	-0.000657	0.000438
	(0.0389)	(0.0224)	(0.0114)	(0.0167)
Observations	4,569	4,569	4,569	4,569

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Cereal Insecurity

Table 38 below shows the unconditional correlation of cereal insecurity and nutritional outcomes of under 5 children. The findings in the table indicate a statistically significant positive correlation between cereal insecurity and stunting but however the correlation is not statistically valid when looking at underweight or wasting. Cereal insecurity is expected to affect nutritional status of under 5 children as it places restrictions on the quantity and quality of dietary intake.[41]

[41] Mulu, E., Mengistie, B. Household food insecurity and its association with nutritional status of under five children in Sekela District, Western Ethiopia: a comparative cross-sectional study. BMC Nutr 3, 35 (2017). https://doi.org/10.1186/s40795-017-0149-z

Table 38: *Treatment with Cereal Insecurity*

VARIABLES	(1) ch_stunting_total	(2) ch_underweight_total	(3) ch_wasting_total1	(4) ch_wasting_total2
fs_cat_d1	0.0590***	0.0127	-0.00525	0.00267
	(0.0147)	(0.00866)	(0.00546)	(0.00577)
Constant	0.245***	0.0753***	0.0356***	0.0345***
	(0.00849)	(0.00508)	(0.00351)	(0.00350)
Observations	4,590	4,590	4,590	4,590
R-squared	0.004	0.000	0.000	0.000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

8 Incidence and Severity of Shocks and Stressors

8.3 Introduction

A shock is defined as "any event which may disrupt the normal functions of socioeconomic agents and/or their activities, impose challenges and threaten household food security."[42] "Shocks are usually (but not always) acute (rapid onset, typically short duration) events…"[43] A stress is a "long-term trend that undermines the potential of a given system and increases the vulnerability of actors within it"[44] and as such are usually (but not always) described as chronic (slow onset)….[45] Commonly in literature, shocks and stresses are classified into one of these four categories: geophysical/meteorological, human induced, biological and technological.

8.4 Descriptive analysis of Shocks experienced by households

Assessment findings reveal that shocks experienced by urban households are almost exclusively in the economic sphere as shown in **Figure 8**. Across all the provinces, 80% of the households indicated that they had experienced a sharp rise in the prices of basic commodities. In addition, the high inflation rate in the country was experienced in the basic necessities with communication services and products rising by 4.6% and food products by 3.3% from November to December 2022.[46] The food products which include bread and cereals and meat in that order had the highest month on month inflation in December 2022.[47] In addition, the global tensions (especially the Russia-Ukraine conflict) have resulted in the rise in international food commodities by 143.6% and international energy commodities by 151.7% in 2022.[48] Given this context, it is not surprising that a sharp increase in prices of other commodities and high transport fares are indicated in **Figure 8** as shocks experienced by households.

[42] Ansah, I. G. K., Gardebroek, C., & Ihle, R. (2019). Resilience and household food security: A review of concepts, methodological approaches and empirical evidence. *Food Security*, *11*(6), 61187–61203. https://doi.org/10.1007/s12571-019-00968-1
[43] Sagara, B. (2018). Resilience Measurement Practical Guidance Note Series 2: Measuring Shocks and Stresses. Produced by Mercy Corps as part of the Resilience Evaluation, Analysis and Learning (REAL) Associate Award.
[44] https://doi.org/10.1093/heapol/czaa002
[45] Sagara, B. (2018). Resilience Measurement Practical Guidance Note Series 2: Measuring Shocks and Stresses. Produced by Mercy Corps as part of the Resilience Evaluation, Analysis and Learning (REAL) Associate Award.
[46] 2022 Population and Housing Census Preliminary Results on Population Figures By Mr Taguma Mahonde (zimstat.co.zw)
[47] 2022 Population and Housing Census Preliminary Results on Population Figures By Mr Taguma Mahonde (zimstat.co.zw)
[48] World Bank Commodity Markets Outlook; October 2022 Pink Sheet Data

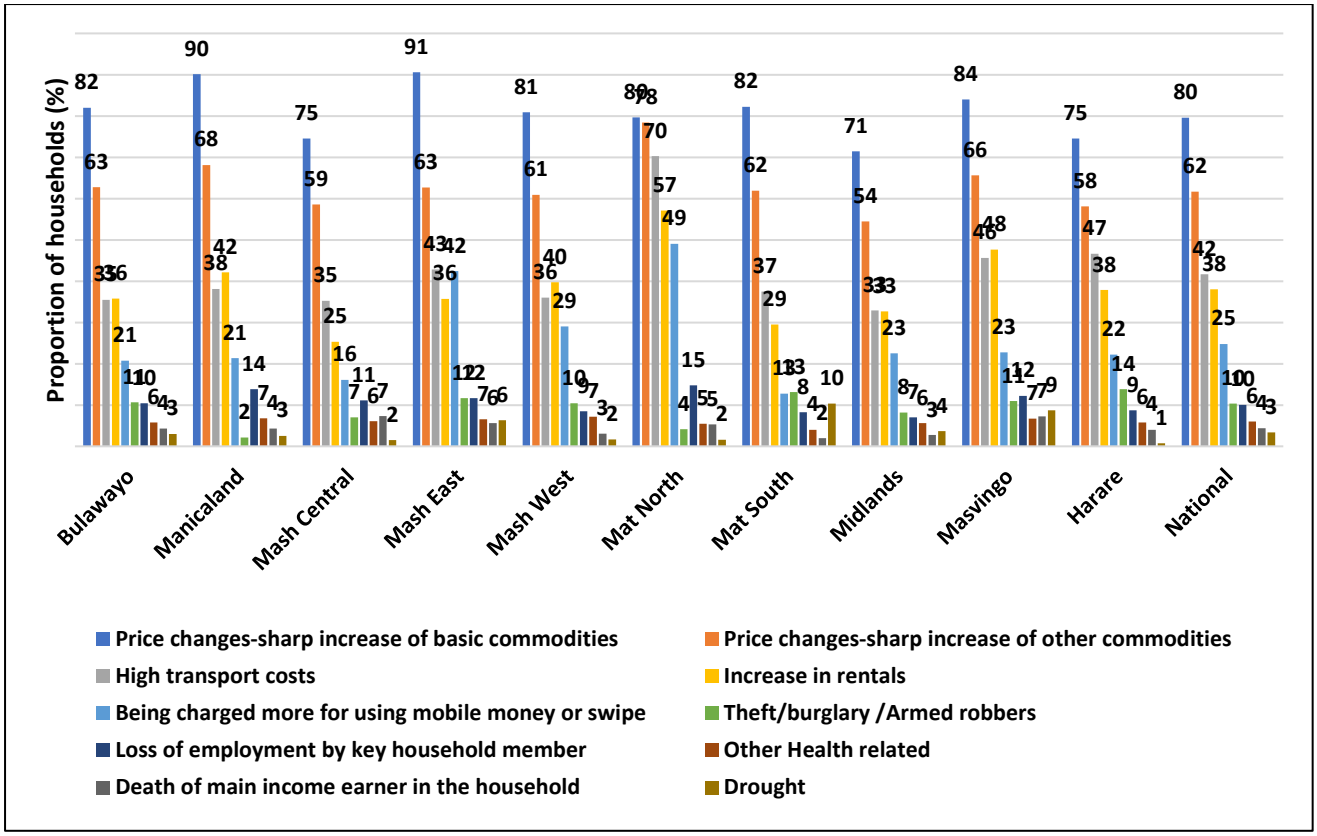


Figure 8: *Common Shocks experienced by Households by Province*

8.4.1 Livelihoods and coping strategies

Urban households are exposed to multiple shocks and stressors which affect their livelihoods in different ways. The way the households respond to these challenges is largely dependent on the resources at their disposal in terms of capabilities and assets. Depending on household status (poor, middle and better-off), they can use food-based coping strategies which are short-term measures or livelihood-based coping strategies which are medium to long term measures to reduce the impact of these shocks and stressors. Engaging in negative coping strategies suggests household vulnerability whilst positive coping suggests households' resilience capacity. Researchers have developed reduced Coping Strategy Index (rCSI) and livelihood-based coping strategies among other cocktail of indicators to measure the extent to which households were able to cope with food and nutrition challenges.

8.4.2 Reduced Coping Strategy Index (rCSI)

When livelihoods are affected negatively by a shock or stressor, households may adopt various mechanisms to cope with declining food access. Reduced Coping Strategy Index is often used as a proxy indicator to measure household food insecurity. This indicator is based on 5 food consumption strategies employed by households when they did not have enough money to buy food. The recall period is usually 7 days. The typical coping strategies are:

changing the diet to less preferred types, reducing portion sizes, reducing number of meals, borrowing food or relying on help from friends or relatives and restricting consumption by adults in order for young children to eat. The lower the scores, the better and the higher score indicates serious food and nutrition security problems in the household.

Table 39 shows that nationally, urban households were engaging in food-based coping strategies which may compromise their nutrition status. The results are showing that about (55%) of the urban households were relying on less preferred and less expensive food. This was followed by limiting portion sizes at mealtimes (38%), reducing the number of meals eaten per day at 37% and borrowing food or relying on help from friends or relatives at 35%. Restricting consumption by adults in order for young children to eat (25%) was the least consumption coping strategy employed by urban households.

Table 39: *Households employing food-based consumption strategies by Province*

Province	Rely on less preferred and less expensive food (%)	Borrow food or rely on help from a relative or friend (%)	Limit portion size of meals at meal times (%)	Restrict consumption by adults in order for small children to eat (%)	Reduce number of meals eaten in a day (%)
Bulawayo	56	30	29	16	30
Manicaland	75	43	48	37	51
Mashonaland Central	41	28	30	22	26
Mashonaland East	50	28	31	24	35
Mashonaland West	61	43	51	35	44
Matabeleland North	52	29	34	23	32
Matabeleland South	53	25	27	16	28
Midlands	55	42	43	30	42
Masvingo	55	36	35	17	34
Harare	55	36	43	28	40
National	55	35	38	25	37

Figure 9 shows that nationally, 36% of the urban households were engaging in high coping strategies. Manicaland, Mashonaland West and Harare reported high coping strategies of 52%, 45% and 40%, respectively. Nationally, no or low coping was 46%. The majority of urban households in Mashonaland Central (60%), Mashonaland East (53%) and Matabeleland South (52%) reported no or low coping. For Matabeleland, this could be attributed to remittances from the neighbouring countries. While for Mashonaland provinces this could be attributed to the contribution of agriculture from surrounding farming areas.

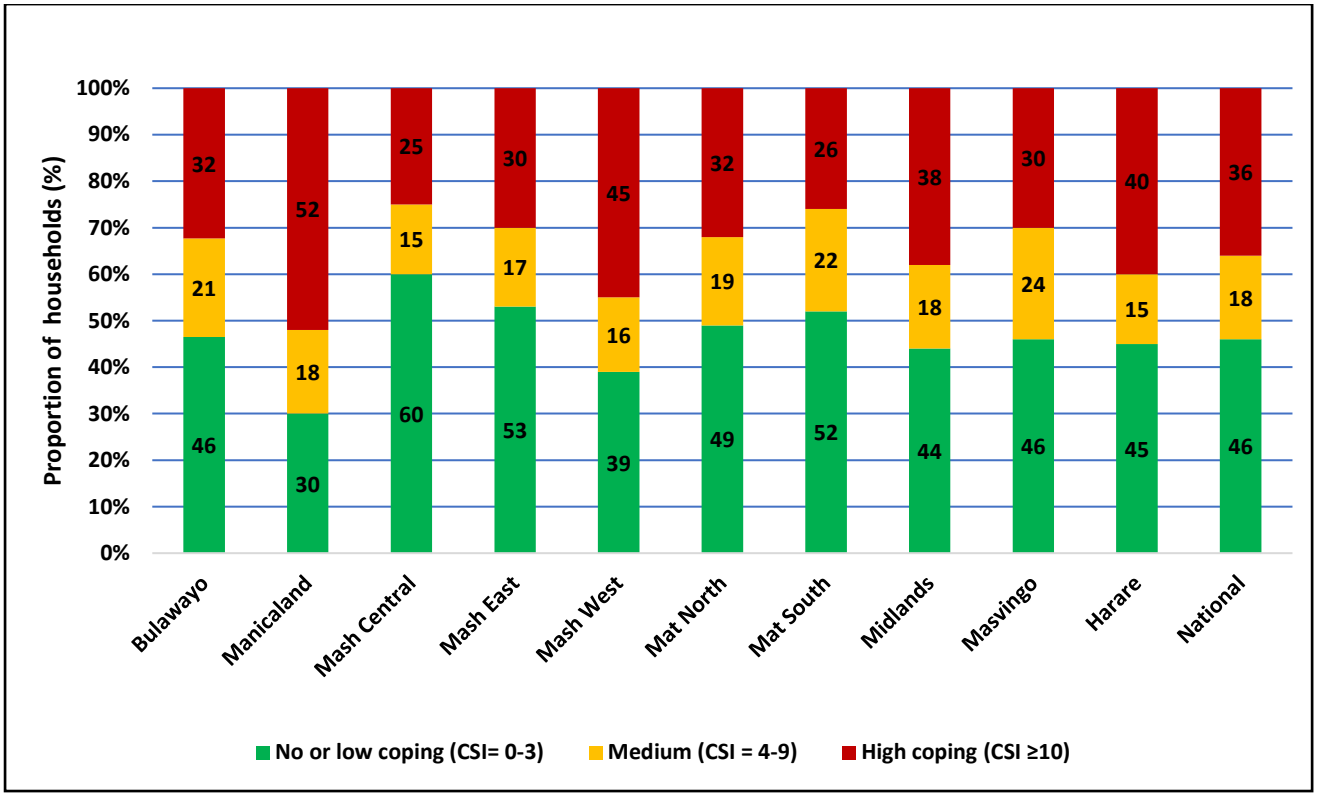


Figure 9: *Households Engaging in Reduced Coping Strategies by Province*

The assessment findings reveal that urban households reported high coping as shown in Figure 10. More than 50% of the households in 13 domains reported high coping. The highest proportions were reported in St Mary's (73%), Redcliffe (72%) and Harare South (69%) domains. No or low coping were reported by households in at least 20 domains, with high proportions reported in Seke (77%), Bindura (76%), Zvishavane (75%), and Gwanda (70%). The mining activities around Bindura, Zvishavane and Gwanda could have influenced the low coping.

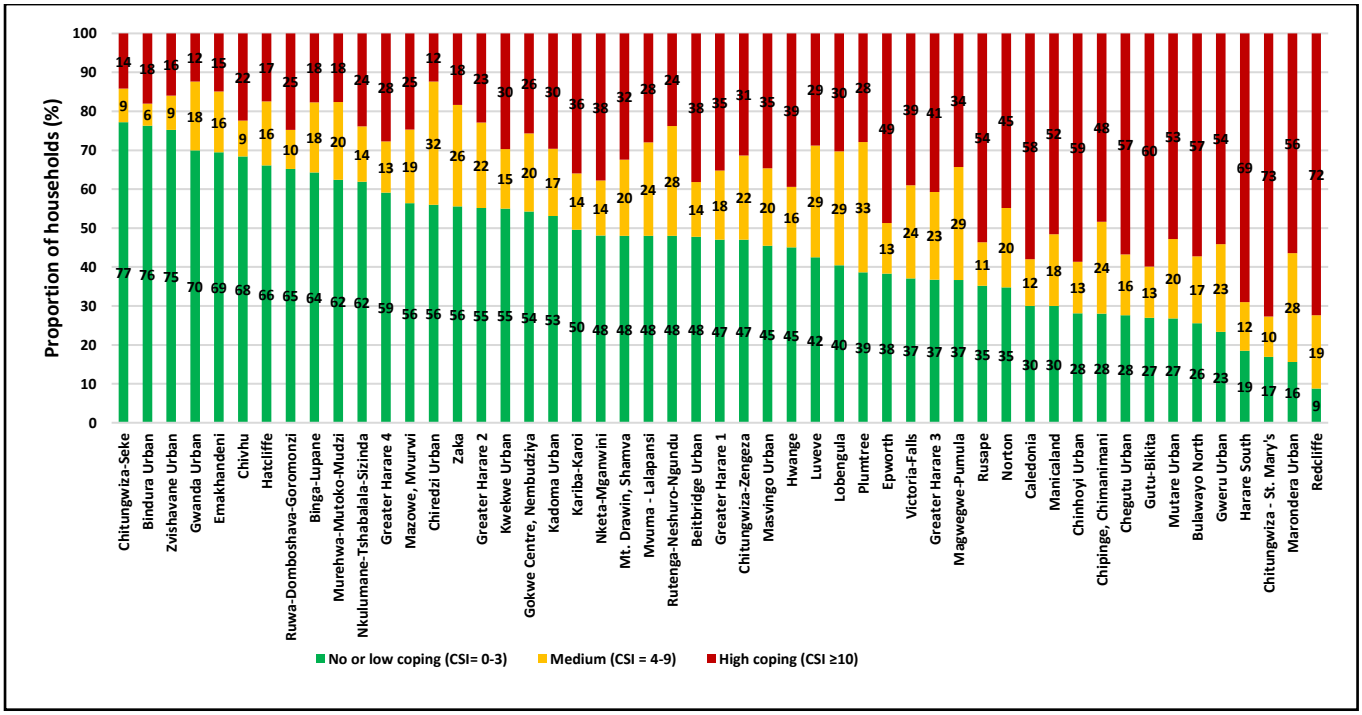


Figure 10: *Households Engaging in Reduced Coping Strategies by Domain*

8.4.3 Livelihoods based Coping Strategy Index

The livelihood-based coping strategy index is used to understand the medium and long-term coping capacity of households in response to lack of food or lack of money to buy food and their ability to overcome challenges in the future. The indicator is derived from a series of questions regarding the households' experiences with livelihood stress and asset depletion to cope with food shortages. The indicator is based on 10 strategies that are relevant for the context. At least 4 of these strategies are stress strategies, 3 crisis strategies and 3 emergency strategies. The assessment has adopted the following livelihood-based strategies:

Classification	Livelihood strategy
Stress	1. Sell household assets/goods 2. Sell more animals (non-productive) 3. Spend savings 4. Borrow money/food
Crisis	5. Reduce non-food expenses on health 6. Sell productive assets 7. Withdraw children from school
Emergency	8. Sell last female animal 9. Sell house or land 10. Beg

Households employ a portfolio of livelihood activities to improve their livelihood outcomes. They accumulate wealth through the purchase of assets, investments and other livelihood

activities that build resilience for the household. Figure 11 shows that 69% of the urban households were not engaging in livelihoods coping strategies. These findings are attributed to Governments' effort to continuously improve the economic conditions, thereby improving household economy. A smaller proportion of urban households were employing crisis (8%) and emergency (9%) coping strategies which is a sign of household vulnerability.

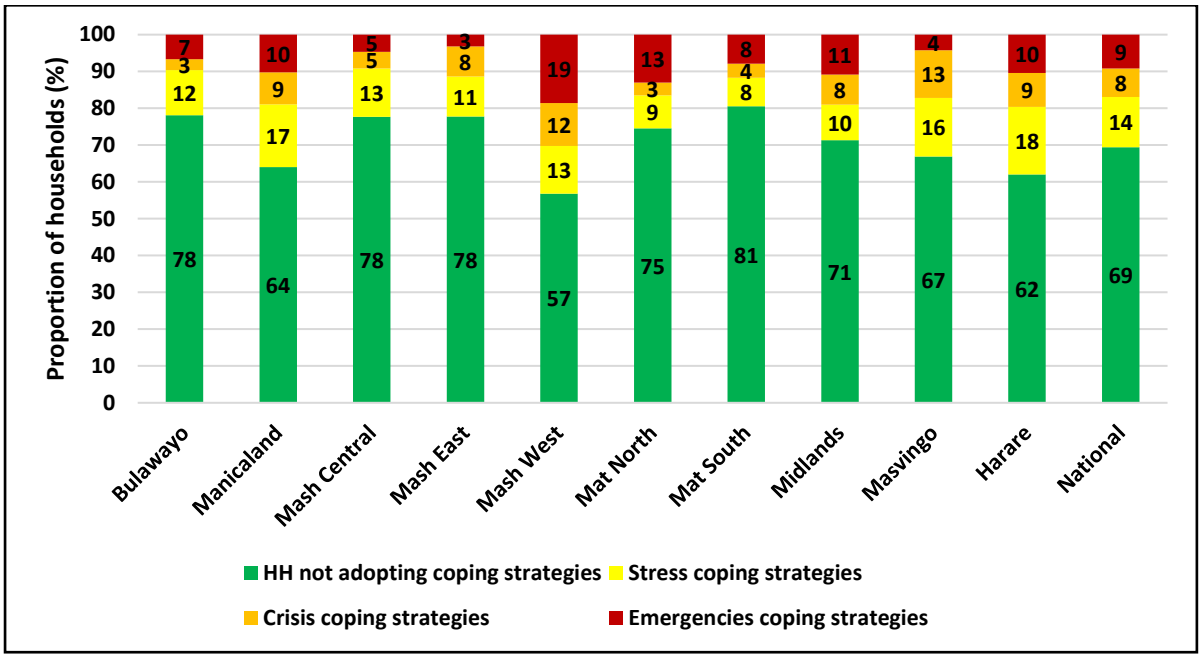


Figure 11: *Households Engaging in Livelihood-based Coping Strategies by Province*

Disaggregating data by domain, findings in Figure 12 reveal that the majority of households in the respective domains did not adopt any livelihoods based coping strategies as they had access to food.

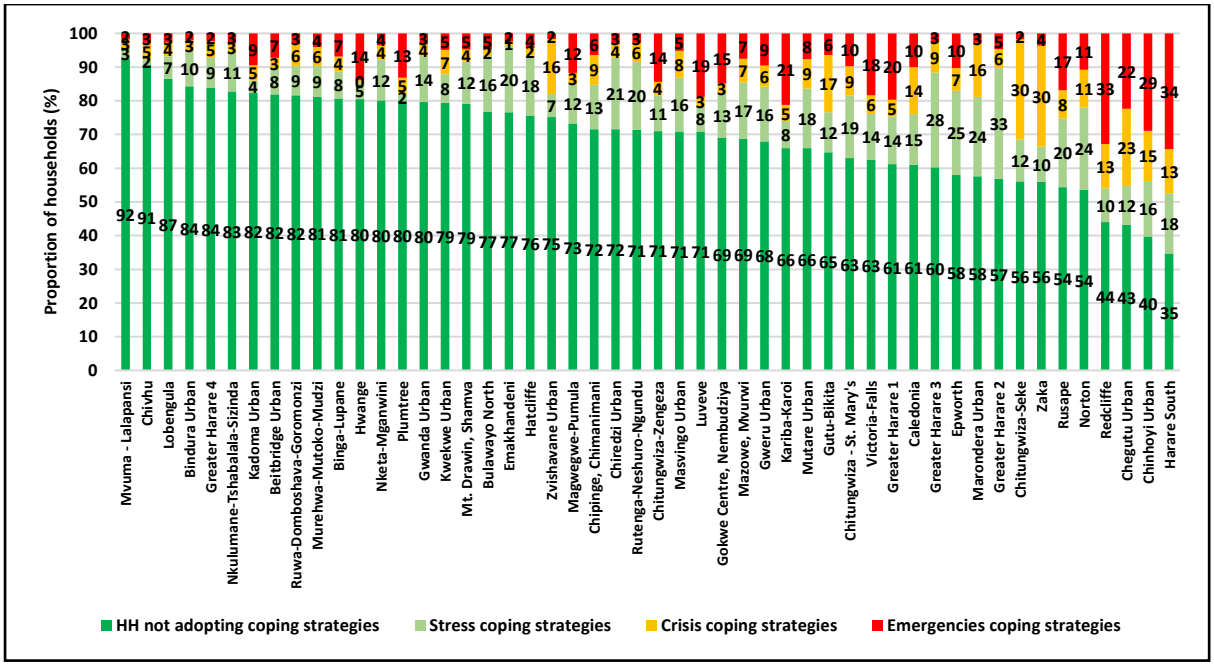


Figure 12: *Households Engaging in Livelihood-based Coping Strategies by Domain*

9 Social Protection

9.3 Introduction

Social protection is defined as "a set of public policies, actions, instruments enacted by a state (formal) or in some cases non-state (informal) actors within a country or a territory to help address poverty and vulnerability experienced by citizens."[49] Zimbabwe is a signatory to various regional and global legal and policy instruments on social protection, some of which include the Universal Declaration of Human Rights of 1948, the International Covenant on Economic, Social and Cultural Rights of 1966, the UN Convention on the Elimination of all Forms of Discrimination against Women (1979), the UN Convention on the Rights of the Child (1990), the UN Convention on the Rights of Persons with Disabilities (2006), UN Millennium Development Goals (2000), African Charter on Human and People's Rights (1981) and the African Charter on the Rights and Welfare of the Child (1990) amongst others.[50] In the contemporary set-up, the country is also party to the Sustainable Development Goals (SDGs) Framework which is the reigning overarching global development policy framework. According to the International Labour Organisation (ILO), these SDGs are a reaffirmation of the member states' commitment to social protection as a vehicle for the attainment of the Global Development Goals.[51]

The country has also instituted a social protection policy named the 'National Social Protection Policy Framework for Zimbabwe.' The policy blueprint articulates the Government's commitment to protecting the vulnerable who include children, persons with disabilities and the elderly amongst others. To this end, for children, Section 75 (1) of the Zimbabwean Constitution guarantees right to access to basic state funded education to all citizens and in 75 (4) an express obligation is placed on the state to provide an environment that facilitates the realisation of this right.[52] To operationalise the realisation, the Education Act was amended in 2019. One of the provisions (Section 68C1) in the amended Act buttresses this right as it makes it illegal to exclude children from school for amongst other things non-payment of fees and levies.[53]

[49] UNDP. *The State of Social Assistance in Africa*; United Nations Development Programme: New York, NY, USA, 2019.

[50] NATIONAL SOCIAL PROTECTION POLICY FRAMEWORK FOR ZIMBABWE (social-protection.org)

[51] wcms_732720.pdf (ilo.org)

[52] Government of Zimbabwe (2013) Constitution of Zimbabwe Amendment (No. 20) Act, 2013.

[53] GoZ (2020) Education Amendment No. 15. 63624-G EDUCATION AMENDMEND Act.indd (veritaszim.net)

9.4 Descriptive analysis

9.4.1 Child Protection in Education

In spite of the progressive institutional landscape just highlighted before, the results presented in Table 40 reveal that some children were not at school and some had been sent away from school due to non-payment of school fees. Whilst the results show that nationally 19.1% of households had children who were not in school at the time of the survey even though they were of school going age. Most of these children were in Harare (20.3%), Midlands (21%) and Mashonaland East (18.7%). In addition, Table 40 shows that nationally, 23.6% of households had children who were sent away from school for non-payment of fees at one point during the first school term of 2023. Manicaland (34.6%) had the highest proportion of households with children ever sent away from school followed by Harare (28.7%).

Table 40: *Children not at School and those sent away from school (%)*

	Currently going to school		Ever sent away from school			
	No (%)	Yes (%)	No (%)	Yes (%)	Don't know (%)	N/a (%)
Bulawayo	19.8	80.2	77.1	15.0	0.1	7.9
Manicaland	17.7	82.3	58.3	34.6		7.1
Mash Central	17.5	82.5	70.0	22.5	0.5	7.0
Mash East	18.7	81.3	70.8	17.7	0.1	11.4
Mash West	18.7	81.3	67.5	23.1	0.2	9.1
Mat North	17.8	82.2	71.8	19.2	0.2	8.8
Mat South	18.4	81.6	76.7	12.9		10.4
Midlands	21.0	79.0	65.4	24.4	0.2	10.0
Masvingo	17.5	82.5	63.6	28.1	0.2	8.1
Harare	20.3	79.7	63.1	28.7	0.2	8.0
National	**19.1**	**80.9**	**67.6**	**23.6**	**0.2**	**8.6**

Nine hundred and forty-five (945) households that indicated that they had children not attending school due to lack of funds highlighted that they were aware of services offered to OVCs in this kind of predicament. These findings are summarised in Table 41. In spite of the households' awareness on the services offered for OVCs, there are however challenges in accessing these services. Some of the challenges identified include corruption, nepotism,

selection errors and being vulnerable in general. These submissions by households are in sync with established knowledge in existing literature.[54]

Table 41: *Households' Awareness of Services Offered to OVCs (%)*

Name of Province	Number of Households aware of services offered to OVCs (%)
Bulawayo	88
Manicaland	50
Mashonaland Central	38
Mashonaland East	57
Mashonaland West	87
Matabeleland North	27
Matabeleland South	22
Midlands	97
Masvingo	67
Harare	412
Total	**945**

9.4.2 Social Protection Services

Assessment findings summarised in Table 42 reveal that 26.2% of sampled households nationally received some kind of support. In terms of sources of support, relatives (11%) emerged as the most common source of support followed by Government (9.2%) and remittances (6.7%). Across the provinces, support from relatives was most prominent in Mashonaland East (15.9%) and Mashonaland West (14.9%). For Government support, households in Mashonaland Central (28.1%) received the highest support and followed by Mashonaland East (17.7%) and Manicaland (15.7%). Remittances from outside the country mostly supported households in Bulawayo (10.4%) followed by those in Mashonaland East (6.9%), Mashonaland West and Matabeleland South both with 6.7%. The continual increase in social support among relatives speaks to a positive economic environment that enables savings, thereby facilitating our cultural norms of helping each other.

Table 42: *Sources of Support (%)*

	Received any support (%)	Support from Government (%)	Support from UN/NGO (%)	Support from Churches (%)	Support from relatives (%)	Support from remittances from outside Zimbabwe (%)
Bulawayo	26.8	8	5.5	2.1	9.4	10.4
Manicaland	29.6	15.7	3.6	2.3	14.5	5.9
Mash Central	34.7	28.1	0.7	2.2	7.2	3.4
Mash East	32.7	17.7	6.2	1.5	15.9	6.9

[54] See for instance Ndlovu, S., Mpofu, M. & Moyo, P. (2019). DOI: 10.1080/0376835X.2019.1584031

Mash West	24.9	5.8	4.3	2.8	14.9	6.7
Mat North	20.8	2.9	5.1	1.9	11.5	5.3
Mat South	14.8	0.8	4.8	1.6	3, 6	6.7
Midlands	32.8	13.4	7.1	2.7	12.2	5.3
Masvingo	31	11.7	9.1	2.1	12.1	6.3
Harare	20.5	3.7	4.5	2.4	9.5	6.2
National	**26.2**	**9.2**	**5.3**	**2.2**	**11**	**6.7**

Table 43 shows that nationally, 5.9% of the households received support in the form of crop inputs whereas 0.9% received cash transfers and 1.2% a miscellany of other unstated forms of support. Across the provinces, crop inputs support was extended to 23.3% of households in Mashonaland Central, 15% in Mashonaland East and 15.1% in Manicaland. Cash transfers were common in bigger urban centers, with Harare leading at 1.6% followed by Masvingo (1.5%) and Bulawayo (1%).

Table 43: *Forms of Government Support to Households (%)*

Province	Food (%)	Cash transfers (%)	Vouchers (%)	Crop inputs (%)	Non-food items (%)	Other (%)
Bulawayo	0.3	1.0	0.3	1.3	0.7	4.3
Manicaland	0.1	0.0	0.0	15.1	0.3	0.3
Mash Central	4.2	0.1	0.0	23.3	0.1	0.4
Mash East	1.1	0.5	0.1	15.0	0.4	0.6
Mash West	0.3	0.5	0.1	3.9	0.3	0.6
Mat North	0.8	0.5	0.1	0.3	0.1	0.9
Mat South	0.1	0.1	0.0	0.0	0.1	0.4
Midlands	0.6	0.8	0.1	10.4	0.6	0.9
Masvingo	1.7	1.5	0.0	8.1	0.0	0.3
Harare	0.5	1.6	0.2	0.7	0.1	0.7
National	**0.8**	**0.9**	**0.1**	**5.9**	**0.3**	**1.2**

As shown in Table 44, most (7%) of the Government support was extended to households followed by the elderly and school children at 1% apiece. The rest of the findings are as presented in Table 44.

Table 44: *Government Support by Targeted Groups (%)*

Province	Households	School Children	Orphans	HIV/AIDS	Elderly	Women	Other
Bulawayo	4.0	2.6	0.1	0.1	1.1	0	0.2
Manicaland	14.8	0.1	0.0	0.1	0.4	0	0.0
Mash Central	26.7	0.4	1.7	0.0	2.9	0.6	0.3
Mash East	16.1	0.4	0.5	0.3	0.9	0	0.1

Mash West	4.2	0.8	0.1	0.0	0.4	0	0.1
Mat North	0.5	1.2	0.4	0.1	0.7	0	0
Mat South	0	0.1	0.3	0.1	0.0	0	0
Midlands	11.4	1.3	0	0.1	0.3	0	0.1
Masvingo	9.8	0.6	0.3	0.2	1.1	0.2	0
Harare	1.2	0.7	0.2	0.1	1.3	0.1	0.1
Total	7.0	1.0	0.3	0.1	1.0	0.1	0.1

Table 45 shows that most of the support from UN/NGOs was in the form of cash transfers (2.4%) or vouchers (1.2%). This is in sync with existing knowledge. For instance, Karamallis (2020) points out that "whether in rural or urban areas, the focus of social protection efforts by both international and national organisations has been primarily on cash transfers to individual households."[55]

Table 45: *Forms of UN/NGO Support to Households (%)*

Province	Food	Cash transfers	Vouchers	Crop inputs	Livestock support -large stock (pass on)	WASH & Non-food items	Other
Bulawayo	0.7	2.6	1.0	0.1	0.9	0.1	0.1
Manicaland	0.3	1.7	0.2	0.2	0.5	0.5	0.2
Mash Central	0.0	0.1	0.0	0.4	0.0	0.0	0.1
Mash East	0.7	0.5	3.9	0.0	0.7	0.5	0.0
Mash West	0.9	1.2	1.1	0.0	1.0	0.0	0.0
Mat North	0.9	2.2	0.7	0.1	0.9	0.4	0.0
Mat South	0.2	3.9	0.1	0.0	0.2	0.1	0.1
Midlands	0.7	4.1	1.2	0.2	0.7	0.1	0.2
Masvingo	1.0	5.0	2.0	0.0	1.0	0.1	0.1
Harare	0.4	2.1	1.1	0.0	0.5	0.1	0.2
National	**0.6**	**2.4**	**1.2**	**0.1**	**0.7**	**0.2**	**0.1**

Table 46 shows that like Government support discussed in the foregoing, most (3.5%) of UN/NGO support is extended to households.

[55] Zimbabwe's Urban Resilience Programme - Slum Dwellers International (sdinet.org)

Table 46: UN/NGO Support by Targeted Groups (%)

Province	Households	School Children	Orphans	HIV/ AIDS	Elderly	Adolescents	Under-five years	Pregnant Lactating mothers	Other
Bulawayo	2.5	0.7	0.3	0.3	1.1	0.1	0.2	0.1	0.8
Manicaland	2.3	0.4	0.4	0.3	0.8	0.1	0.1	0.1	0.0
Mash Central	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Mash East	5.0	0.0	0.1	0.6	0.7	0.1	0.0	0.0	0.0
Mash West	3.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.6
Mat North	1.5	0.4	1.3	0.7	1.3	0.4	0,9	1.1	0.1
Mat South	2.4	1.7	0.7	0.1	0.7	0.1	0.9	0.3	0.3
Midlands	6.2	0.3	0.1	0.3	0.1	0.0	0.0	0.1	0.3
Masvingo	7.8	1.0	0.1	0.0	0.2	0.0	0.1	0.0	0.7
Harare	2.7	0.6	0.2	0.1	0.6	0.1	0.4	0.2	0.2
National	**3.5**	**0.6**	**0.3**	**0.2**	**0.6**	**0.1**	**0.3**	**0.2**	**0.4**

9.5 Inferential Analysis

9.5.1 Social Support from the Government

Table 47 presents the output of inferential analysis of determinants of social support from the Government. At the 1% level of significance and *ceteris paribus*, increasing the age of the household head by one year increased the inclination of the household to receive social support from Government by 0.24%. Also, widowhood increased one's chances of getting Government social support by 3.84%. Similarly, bigger households were 0.66% more likely to receive social support than smaller ones. With respect to provinces, households in Bulawayo, Mashonaland Central, Midlands and Masvingo provinces were more likely to receive social support from the Government than the other provinces.

Table 47: OLS estimates of determinants of social protection support from Government

VARIABLES	OLS (1) Government	Probit (2) Government	Logit (3) Government
Household head is female	0.00199	0.00111	0.00508
	(0.00718)	(0.0546)	(0.107)
Household head age [Years]	0.00243***	0.0153***	0.0288***
	(0.000241)	(0.00143)	(0.00272)
Widow/widower	0.0384***	0.202***	0.366***
	(0.0113)	(0.0672)	(0.129)
Household head is chronically ill	0.0137*	0.0824*	0.161**
	(0.00766)	(0.0427)	(0.0808)
Household size	0.00665***	0.0445***	0.0815***

	(0.00152)	(0.00876)	(0.0164)
Number of orphaned members	-0.0115	-0.0660	-0.128
	(0.0121)	(0.0727)	(0.139)
Bulawayo	0.0250***	0.314***	0.608***
	(0.00715)	(0.0606)	(0.129)
Manicaland	0.112***	0.788***	1.520***
	(0.0136)	(0.0702)	(0.139)
Mash Central	0.239***	1.250***	2.348***
	(0.0166)	(0.0650)	(0.125)
Mash East	0.148***	0.973***	1.874***
	(0.0124)	(0.0629)	(0.125)
Mash West	0.0159**	0.219***	0.419***
	(0.00735)	(0.0725)	(0.155)
Mat North	0.00377	0.0287	-0.0498
	(0.00732)	(0.104)	(0.237)
Mat South	-0.0227***	-0.554***	-1.491***
	(0.00510)	(0.164)	(0.423)
Midlands	0.0981***	0.743***	1.441***
	(0.00959)	(0.0597)	(0.122)
Masvingo	0.0841***	0.680***	1.325***
	(0.00966)	(0.0631)	(0.128)
Income	0.00279**	0.0267**	0.0489**
	(0.00133)	(0.0105)	(0.0203)
Constant	-0.130***	-3.064***	-5.602***
	(0.0239)	(0.172)	(0.332)
Observations	13,256	13,256	13,256
R-squared	0.082		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

9.5.2 Social support from the UN/NGOs

Table 48 shows that an increase in the household age increases the likelihood of receiving social protection support from the UN/NGOs whereas there is a negative association between having a household head without any disability and getting support from the UN/NGOs. In addition, all things being equal there is less likelihood of a household headed by a person without any form of disability getting social protection support from UN/NGOs whereas if the household head has a chronic condition, it increases the likelihood of getting support by 0.22%.

Table 48: *OLS estimates of determinants of social protection support from UN/NGOs*

VARIABLES	(1) UN/NGO	(2) UN/NGO	(3) UN/NGO
Household head is female	0.0101*	0.115*	0.261**
	(0.00562)	(0.0599)	(0.127)
Household head age [Years]	0.000752***	0.00709***	0.0150***
	(0.000190)	(0.00167)	(0.00349)
Married living apart	-0.0230***	-0.254***	-0.567***
	(0.00681)	(0.0857)	(0.193)
Divorced/Separated	-0.0158**	-0.163**	-0.367**
	(0.00748)	(0.0785)	(0.166)
Widow/Widower	-0.00456	-0.0803	-0.192

	(0.00877)	(0.0755)	(0.157)
Cohabiting	-0.00926	-0.123	-0.310
	(0.0184)	(0.236)	(0.529)
Never married	-0.0168**	-0.254**	-0.605**
	(0.00707)	(0.107)	(0.244)
Household head does not have any disability	-0.0227**	-0.157***	-0.316***
	(0.00897)	(0.0603)	(0.122)
Household head is chronically ill	0.0224***	0.179***	0.368***
	(0.00641)	(0.0482)	(0.100)
Household size	0.00713***	0.0624***	0.124***
	(0.00129)	(0.00986)	(0.0197)
Number of orphaned members	0.00472	0.0300	0.0489
	(0.0115)	(0.0767)	(0.154)
Protestant	0.0136	0.104	0.251
	(0.00834)	(0.0781)	(0.165)
Pentecostal	0.00737	0.0501	0.138
	(0.00720)	(0.0714)	(0.153)
Apostolic sect	0.0127*	0.117	0.262*
	(0.00754)	(0.0730)	(0.155)
Zion	0.00509	0.0440	0.105
	(0.0109)	(0.103)	(0.219)
Other Christian	-0.00200	-0.0338	-0.0411
	(0.0101)	(0.0990)	(0.210)
Islam	0.0183	0.155	0.361
	(0.0254)	(0.204)	(0.419)
Traditional	-0.0174	-0.250	-0.546
	(0.0174)	(0.266)	(0.612)
Other religion	-0.0217*	-0.359	-0.754
	(0.0123)	(0.221)	(0.522)
No religion	0.0217**	0.185*	0.436**
	(0.0100)	(0.0954)	(0.203)
Bulawayo	0.00539	0.0660	0.121
	(0.00642)	(0.0623)	(0.134)
Manicaland	-0.0124	-0.139	-0.301
	(0.00779)	(0.0962)	(0.216)
Mash Central	-0.0378***	-0.782***	-1.929***
	(0.00490)	(0.171)	(0.458)
Mash East	0.0249***	0.224***	0.497***
	(0.00847)	(0.0746)	(0.158)
Mash West	-0.00259	-0.0313	-0.0664
	(0.00679)	(0.0753)	(0.165)
Mat North	0.0148	0.161*	0.306
	(0.00906)	(0.0894)	(0.193)
Mat South	0.00909	0.0948	0.191
	(0.00878)	(0.0902)	(0.195)
Midlands	0.0266***	0.225***	0.491***
	(0.00759)	(0.0641)	(0.135)
Masvingo	0.0521***	0.423***	0.885***
	(0.00898)	(0.0646)	(0.132)
Income	-0.00359***	-0.0336***	-0.0642***
	(0.00118)	(0.00993)	(0.0185)
Constant	0.0323	-1.870***	-3.516***
	(0.0202)	(0.175)	(0.352)
Observations	13,255	13,255	13,255
R-squared	0.022		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

10. Household Hunger Scale

10.1.1 . Household Hunger Scale by Province

The Household Hunger Scale (HHS) consists of three questions and three frequencies that, when administered in a population-based household survey, allows for estimating household food access challenges by three different severities of household hunger: 1) Little to no household hunger; 2) Moderate household hunger; and 3) Severe household hunger.

Figure 13 presents the Household Hunger Scale by province. Nationally, about 14% of urban households reported experiencing moderate hunger and 2% severe hunger. Midlands (6%) had a high proportion of households experiencing severe hunger.

*Figure **13**: Household Hunger Scale by Province*

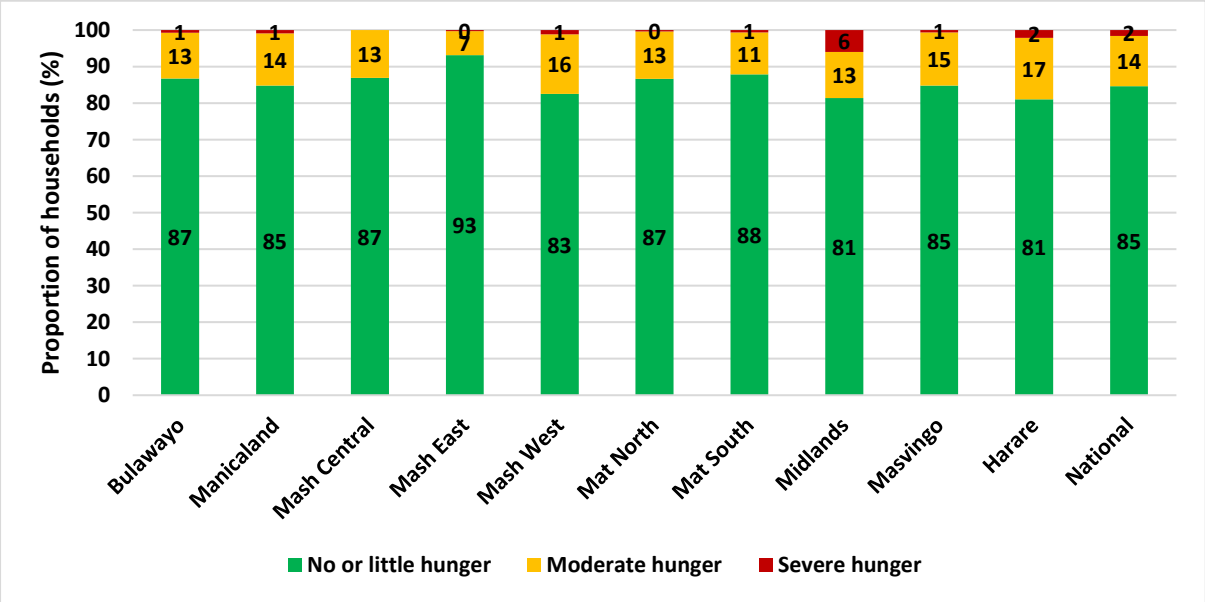
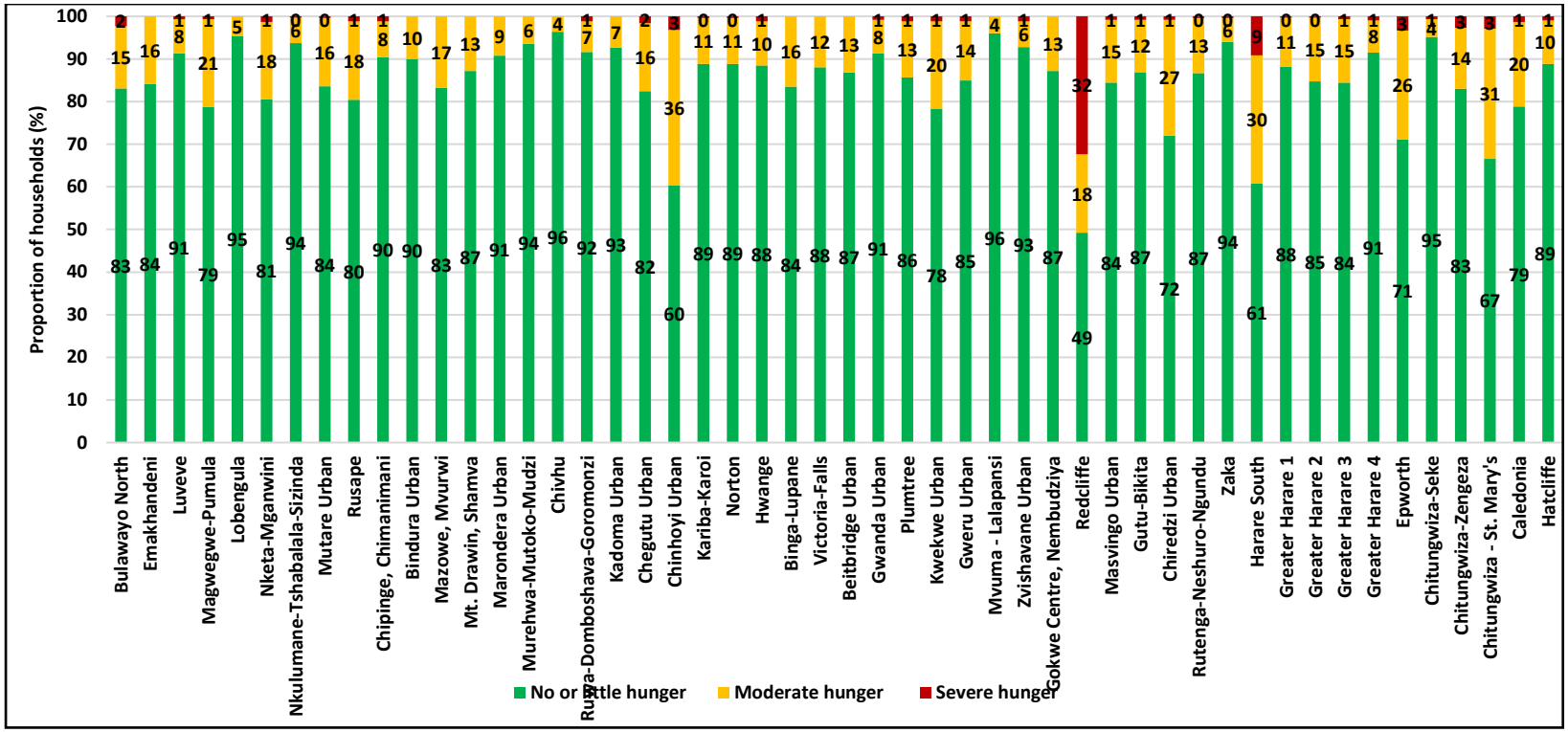


Figure 14 presents household hunger scale by domain. Redcliffe (32%) and Harare South (9%) had a high proportion of households experiencing severe hunger. The proportion of households experiencing high moderate hunger were in Chinhoyi (36%), Chitungwiza-St Mary's (31%) and Harare South (30%).

Figure 14: *Household Hunger Scale by Domain*



Food Consumption Score

Figure 15 presents food consumption score by province. Nationally, results are showing that 79% of urban households were consuming acceptable diets, 18% borderline and 3% poor diets. Even though consumption of poor diets was low, about 12% of households in Matabeleland North were consuming poor diets. This was followed by urban households in Mashonaland East and Mashonaland West with 5% and 4%, respectively.

Figure 15: *Food Consumption Score by Province*

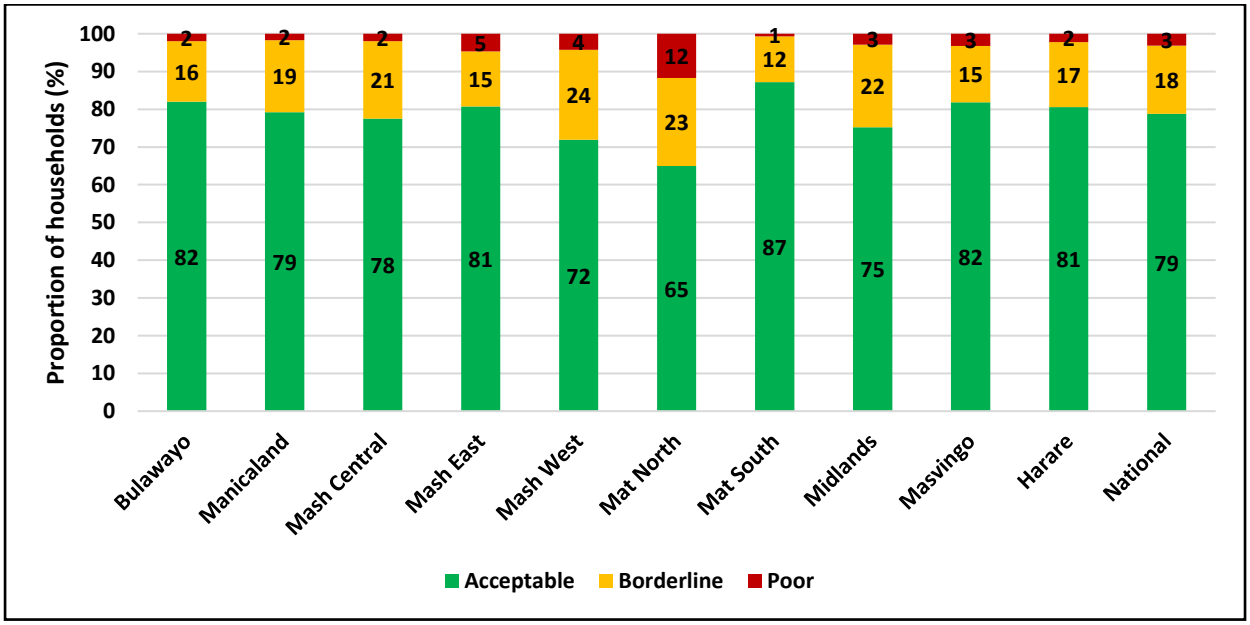
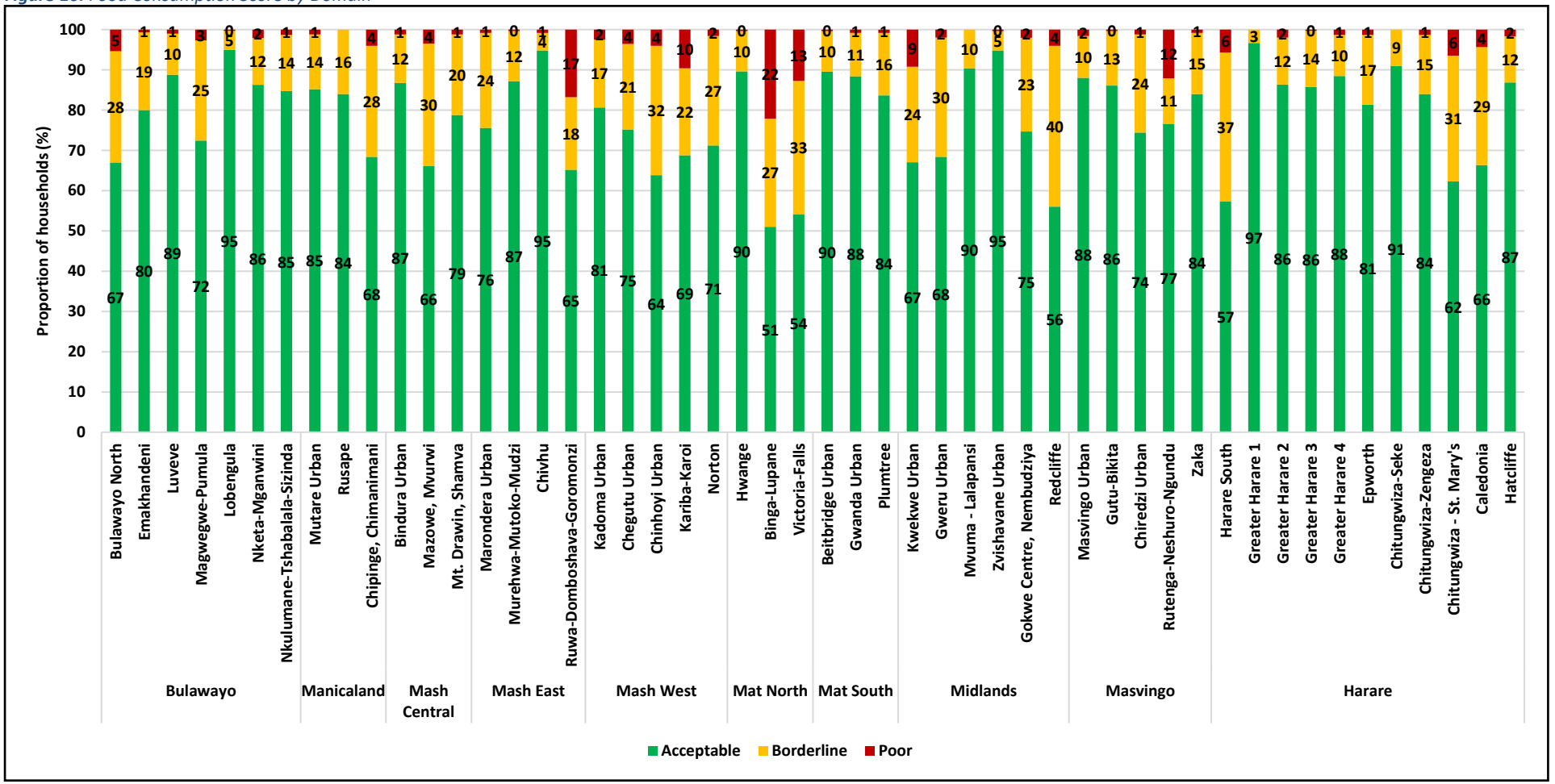


Figure 16 presents Food Consumption Score by domain. The consumption of poor diets was low across domains. However, 4 domains are showing signs of food access challenges. Binga-Lupane (22%), Ruwa-Goromonzi-Domboshava (17%), Victoria Falls (13%) and Rutenga-Neshuro-Ngundu (12%) were consuming poor diets.

Figure 16: Food Consumption Score by Domain



11. Household Cereal Insecurity

11.1 Introduction

This section presents the results of sampled urban households by cereal insecurity. Food insecurity is defined as the lack of regular access to enough safe and nutritious food for normal growth and development and an active and healthy life. The lack may be due to unavailability of food and/or lack of resources to obtain food[56]. The assessment measured the minimum amount of food energy available to a household from all its potential sources compared to the household food energy requirements, all converted to cereal equivalent. The household was deemed cereal insecure when the household's food energy requirements are greater than the food energy available from all its potential sources. In this report, food security relates to cereal grain availability as maize is the main staple food in Zimbabwe. Therefore, food insecure households are households that are cereal insecure.

11.2 Descriptive Analysis of Cereal Insecurity

The results presented in **Table 49** show that 29% of the sampled urban households were projected to be cereal insecure. Midlands (40%), Matabeleland North (35%) and Mashonaland West (34%) provinces had the highest projected cereal insecure households and Matabeleland South (22%) reported the least. Approximately 1.5 million of the urban population are projected to be cereal insecure. Harare with approximately 705,480, was contributing almost half of the cereal insecure population. Bulawayo (181,308), Midlands (174,027), Mashonaland West (148,719) and Mashonaland East (103,286) provinces had substantial cereal insecure populations. The monthly cereal requirement for the cereal insecure households in urban areas was estimated to be 18,915 metric tonnes. All things being equal, this translates to 56,745 MT of cereal requirements quarterly and 226,982 MT annually.

Table 49: *Cereal insecurity by Province*

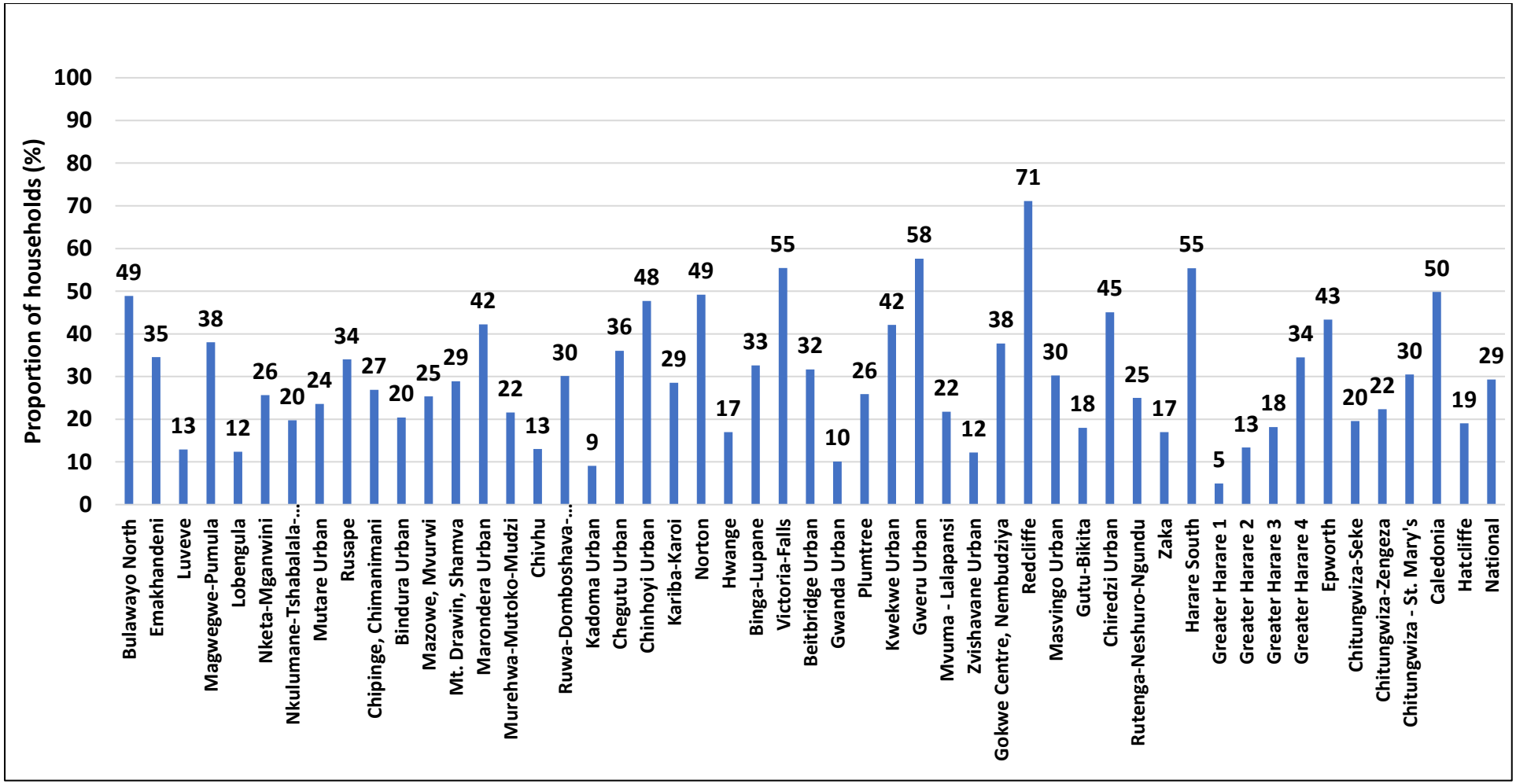
Province	Cereal Insecure (%)	Cereal Insecure Population	Monthly Cereal Requirement (MT)	Quarterly Cereal Requirement (MT)	Annual Cereal Requirement (MT)
Bulawayo	27	181,308	2,236	6,708	26,834
Manicaland	28	83,926	1,035	3,105	12,421
Mash Central	25	21,646	267	801	3,204

[56] FAO (2019). https://www.fao.org/hunger/en/

Mash East	27	103,286	1,274	3,822	15,286
Mash West	34	148,719	1,834	5,503	22,010
Mat North	35	32,918	406	1,218	4,872
Mat South	22	22,417	276	829	3,318
Midlands	40	174,027	2,146	6,439	25,756
Masvingo	27	50,711	625	1,876	7,505
Harare	28	705,480	8,701	26,103	104,411
National	**29**	**1,533,661**	**18,915**	**56,745**	**226,982**

The results in **Figure 17** are showing that households in 22 domains had a projected cereal insecurity of more than the national average of 29%. Five of these domains had cereal insecurity of greater or equal to 50%. Redcliffe (71%), Gweru (58%), Victoria Falls (55%), Harare South (55%) and Caledonia (50%) reported the highest cereal insecurity. Gwanda (10%), Kadoma (9%) and Greater Harare 1 (5%) had the least cereal insecurity.

Figure 17: Cereal Insecurity by Domain



11.3. Movement of cereal insecurity with other food security and nutrition security measures

Table 50 shows that households that were cereal insecure were worse off than those that were cereal secure in all the other food and nutrition security measures before controlling for observed confounders.

Table 50: *Two tailed T-Test*

	Household is cereal insecure				Difference in means
	Yes [Y]		No [N]		
	Mean	S.D	Mean	S.D	[Y – N]
No or low consumption coping	0.263	0.440	0.548	0.498	-0.285***
No or low livelihoods coping	0.588	0.492	0.744	0.437	-0.156***
FCS	39.31	15.09	57.67	19.70	-18.37***
HDDS	5.280	1.688	6.836	1.884	-1.556***
No protein consumption	0.016	0.126	0.003	0.056	0.013***
No vitamin consumption	0.007	0.080	0.003	0.051	0.004***
No iron consumption	0.021	0.142	0.007	0.086	0.013***

Notes: The last column shows the results of the two-tailed t-test for the difference in the means. ***, **, and * indicate the 1, 5, and 10 percent levels of significance.

Correlations of cereal insecurity and other food and nutrition security measures

Table 51 shows that all things being equal, households that are female headed have less likelihood of engaging in consumption coping strategies, have higher food consumption score and dietary diversity and are less likely to be cereal insecure than those that are headed by males.

The older the head of the household is, the less likely the household engages consumption or livelihood coping strategies and also is cereal insecure, all things being held constant. Age of the household head is however not related.

Households headed by persons that are married and living apart are ceteris paribus less likely to engage in livelihoods or consumption coping strategies or to be cereal insecure than their counterparts headed by persons married and living with their spouses at the 1% level of significance. This is likely because due to the diversity of income sources and risk spreading that the set-up of being married and living apart offers. On the other hand, households that are headed by persons that have never been married perform well in all measures in the majority of food and nutrition security measures. The households are ceteris paribus less likely to engage in coping strategies (both livelihoods and consumption), not consume iron rich foods or be cereal insecure than those that are married and living with

their spouse. Widowed/widower headed households are ceteris paribus worse off than households headed by persons married and living together with their spouse in the majority of food and nutrition security indicators.

Households that are headed by heads who do not have a chronic illness or disability perform better in all the measures of food but not nutrition security. They are less likely to engage in coping strategies, have higher food consumption and dietary diversity scores and are less likely to be cereal insecure all things being equal. The same trend is observed for smaller households, ceteris paribus.

All things being equal, in comparison to the base religion of Catholicism, households headed by a member of the Apostolic sect, Zion and other Christian religions are more likely to be cereal insecure. Furthermore, they are more likely to engage in coping (Apostolic and Zion) and have less food consumption and dietary diversity scores. Notwithstanding lower food consumption scores or household dietary diversity scores, those who engage traditional religion are more likely to consume proteins and iron. The section on treatment nutrition gives more detail of the relationship of traditional religion and anthropometric outcomes. Being of no religion is associated with increased incidences of cereal insecurity and worse off in other measures of food security.

In comparison to the base province of Harare, Mashonaland West, Matabeleland North and Midlands provinces are, all things being equal, more likely to have households that are cereal insecure at the 1% level of significance. On the other hand, Matabeleland South province have less likelihood to have households that are food insecure at the 10% level of significance.

Table 51: *Correlations of Cereal Insecurity with Food and Nutrition Measures*

	Other measures of food security				Nutrition measures			Cereal insecure
VARIABLES	No or low consumption coping (I)	No or low livelihoods coping (II)	FCS (III)	HDDS (IV)	No protein consumption (V)	No vitamin consumption (VI)	No iron consumption (VII)	(VIII)
Household head is female	-0.0351***	-0.0158	1.094**	0.153***	0.000201	-0.00150	0.000572	-0.0195*
	(0.0131)	(0.0121)	(0.520)	(0.0517)	(0.00207)	(0.00184)	(0.00270)	(0.0111)
Household head age [Years]	0.000960**	0.00283***	0.0337**	0.00266*	-5.07e-05	-1.90e-05	-5.27e-05	-0.000815**
	(0.000391)	(0.000352)	(0.0155)	(0.00155)	(6.01e-05)	(5.71e-05)	(9.04e-05)	(0.000356)
Married living apart	0.0897***	0.0650***	1.055	0.0812	-0.00277	0.00349	-0.00509*	-0.0441***
	(0.0167)	(0.0148)	(0.656)	(0.0635)	(0.00261)	(0.00305)	(0.00302)	(0.0146)
Divorced/Separated	-0.0436**	-0.000271	-3.414***	-0.329***	0.00116	-0.000489	0.000439	0.00553
	(0.0172)	(0.0165)	(0.671)	(0.0674)	(0.00311)	(0.00235)	(0.00394)	(0.0151)
Widow/Widower	0.0153	0.0138	-2.997***	-0.333***	-0.000533	-0.00257	0.000837	0.0394**
	(0.0178)	(0.0165)	(0.698)	(0.0701)	(0.00301)	(0.00211)	(0.00432)	(0.0158)
Cohabiting	-0.0182	-0.0186	-3.169**	-0.204	-0.0110***	-0.00517***	-0.0157***	0.0850**
	(0.0456)	(0.0440)	(1.460)	(0.158)	(0.00213)	(0.00131)	(0.00258)	(0.0415)
Never married	0.0895***	0.0713***	0.802	-0.000233	-0.00452	-0.00322	-0.00739*	-0.0461***
	(0.0200)	(0.0171)	(0.773)	(0.0819)	(0.00336)	(0.00209)	(0.00391)	(0.0160)
Household head does not have any disability	0.0325**	0.0662***	1.275**	0.155**	0.00328	-0.00137	-0.000169	-0.0358**
	(0.0152)	(0.0150)	(0.620)	(0.0631)	(0.00241)	(0.00227)	(0.00388)	(0.0146)
Household head is chronically ill	-0.0870***	-0.0775***	-1.691***	-0.107**	0.00212	0.00156	0.000494	0.0398***
	(0.0117)	(0.0114)	(0.452)	(0.0450)	(0.00249)	(0.00155)	(0.00289)	(0.0111)
Household size	-0.0324***	-0.0283***	-0.940***	-0.0576***	5.75e-07	-0.000223	0.000214	0.0705***
	(0.00238)	(0.00234)	(0.0946)	(0.00944)	(0.000431)	(0.000274)	(0.000611)	(0.00228)
Number of orphaned members	-0.0226	0.000807	-1.266*	-0.0321	0.0133*	-0.000454	0.0163	0.0524***
	(0.0193)	(0.0197)	(0.711)	(0.0748)	(0.00757)	(0.00172)	(0.0101)	(0.0199)
Protestant	-0.0147	0.00497	-0.0551	-0.0703	0.000150	-0.00182	-0.00281	0.00345
	(0.0178)	(0.0159)	(0.721)	(0.0719)	(0.00275)	(0.00185)	(0.00405)	(0.0154)
Pentecostal	-0.0166	-0.0221	-1.578**	-0.0908	-0.000572	0.000350	-0.00284	0.0267*
	(0.0159)	(0.0145)	(0.650)	(0.0646)	(0.00246)	(0.00207)	(0.00368)	(0.0139)
Apostolic sect	-0.0846***	-0.0464***	-5.986***	-0.527***	0.00181	0.00314	0.000646	0.119***
	(0.0165)	(0.0151)	(0.667)	(0.0665)	(0.00269)	(0.00242)	(0.00393)	(0.0146)
Zion	-0.0519**	-0.0246	-4.843***	-0.309***	0.00379	0.000859	-0.00134	0.0845***
	(0.0237)	(0.0215)	(0.908)	(0.0913)	(0.00467)	(0.00330)	(0.00561)	(0.0216)
Other Christian	-0.0360	-0.00422	-2.141**	-0.0718	0.00394	-0.00114	-0.00147	0.0825***
	(0.0229)	(0.0205)	(0.893)	(0.0878)	(0.00436)	(0.00258)	(0.00511)	(0.0203)
Islam	-0.0712	-0.0628	-6.230***	-0.516***	0.00593	-0.00323*	0.00163	0.0675

	(0.0482)	(0.0476)	(1.918)	(0.200)	(0.0110)	(0.00186)	(0.0126)	(0.0461)
Traditional	-0.0189	-0.0751	-6.764***	-0.363*	-0.00532**	-0.00266	-0.0123***	-0.0276
	(0.0488)	(0.0472)	(2.035)	(0.217)	(0.00237)	(0.00186)	(0.00351)	(0.0401)
Other religion	0.0323	-0.0284	-3.802**	-0.241	0.0189	-0.00287*	0.0132	0.0138
	(0.0378)	(0.0351)	(1.567)	(0.160)	(0.0118)	(0.00171)	(0.0125)	(0.0327)
No religion	-0.0674***	-0.0387*	-4.812***	-0.383***	0.00677	-0.000127	0.00211	0.0308*
	(0.0213)	(0.0199)	(0.820)	(0.0828)	(0.00435)	(0.00266)	(0.00530)	(0.0187)
Bulawayo	0.0155	0.149***	-2.872***	-0.374***	0.00572**	0.00192	0.00893**	0.0105
	(0.0140)	(0.0127)	(0.541)	(0.0553)	(0.00266)	(0.00183)	(0.00383)	(0.0124)
Manicaland	-0.144***	0.0227	-2.594***	-0.448***	0.000598	-0.00194	-0.000812	-0.0211
	(0.0180)	(0.0191)	(0.756)	(0.0704)	(0.00298)	(0.00171)	(0.00426)	(0.0176)
Mash Central	0.149***	0.149***	-3.068***	-0.368***	-0.00197	0.00134	0.000634	-0.0281
	(0.0196)	(0.0174)	(0.793)	(0.0766)	(0.00248)	(0.00270)	(0.00460)	(0.0173)
Mash East	0.0655***	0.141***	1.372*	0.179**	-0.00289	-0.00271*	-0.00564*	0.0172
	(0.0175)	(0.0155)	(0.757)	(0.0738)	(0.00197)	(0.00154)	(0.00303)	(0.0156)
Mash West	-0.0571***	-0.0514***	-7.259***	-0.763***	0.00342	0.000452	-0.00464	0.0570***
	(0.0159)	(0.0161)	(0.598)	(0.0631)	(0.00300)	(0.00196)	(0.00314)	(0.0149)
Mat North	0.0329	0.119***	-9.073***	-1.059***	0.000885	0.00918**	-0.00797***	0.150***
	(0.0203)	(0.0182)	(0.776)	(0.0773)	(0.00333)	(0.00455)	(0.00273)	(0.0195)
Mat South	0.0652***	0.178***	-0.192	-0.247***	0.00485	-0.00172	0.00593	-0.0322*
	(0.0197)	(0.0168)	(0.734)	(0.0716)	(0.00412)	(0.00182)	(0.00535)	(0.0180)
Midlands	0.0207	0.101***	-2.226***	-0.285***	0.00706**	0.00301	0.00237	0.139***
	(0.0154)	(0.0147)	(0.620)	(0.0550)	(0.00345)	(0.00246)	(0.00400)	(0.0146)
Masvingo	0.00734	0.0384**	-4.858***	-0.721***	-0.00140	-0.000688	-0.00217	0.00181
	(0.0166)	(0.0159)	(0.607)	(0.0585)	(0.00224)	(0.00193)	(0.00340)	(0.0149)
Income	0.0532***	0.0249***	4.225***	0.355***	-0.00169***	-0.00162**	-0.00155**	
	(0.00420)	(0.00285)	(0.162)	(0.0159)	(0.000525)	(0.000763)	(0.000612)	
Constant	-0.0574	0.303***	9.037***	2.707***	0.0227***	0.0257**	0.0315***	-0.0113
	(0.0581)	(0.0440)	(2.270)	(0.222)	(0.00746)	(0.0112)	(0.0107)	(0.0273)
Observations	13,246	13,243	13,252	13,222	12,053	12,793	10,929	13,269
R-squared	0.073	0.059	0.153	0.122	0.005	0.005	0.005	0.107

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

11.4.1 Correlates of cereal insecurity

Column (I) of Table 52 shows that female headed households are marginally statistically associated with cereal insecurity, all things being equal. The results are however not robust to change in specification in Columns (II) and (III). Column (I) further shows *ceteris paribus*, that an increase in the age of the household head by one year decreases the probability of the household being cereal insecure by 0.815% at the 5% level of significance. In comparison to household heads married and living with a spouse, being married and living apart or never married decreases the probability of being cereal insecure all things equal. Similarly, in comparison to being married and living with a spouse, being a widow/widower or cohabiting increases the likelihood of the household being cereal insecure other things being held constant.

Furthermore, the results show that disability or having a chronic condition on the part of the household head ceteris paribus increases the likelihood of the household being food insecure, other things being equal. An increase in the household size or the number of orphaned members is associated with an increase in the probability of the household being food insecure. In comparison to Catholic religion, Pentecostal, apostolic sect, Zion or other Christian religions are ceteris paribus associated with higher incidences of cereal insecurity.

Table 52: *Correlates of cereal insecurity*

VARIABLES	Cereal insecurity		
	OLS	Probit	Logit
	(I)	(II)	(III)
Household head is female	-0.0195*	-0.0569	-0.0916
	(0.0111)	(0.0369)	(0.0613)
Household head age [Years]	-0.000815**	-0.00276**	-0.00481**
	(0.000356)	(0.00113)	(0.00192)
Married living apart	-0.0441***	-0.154***	-0.255***
	(0.0146)	(0.0489)	(0.0831)
Divorced/separated	0.00553	0.00653	0.0158
	(0.0151)	(0.0488)	(0.0812)
Widow/widower	0.0394**	0.113**	0.192**
	(0.0158)	(0.0498)	(0.0830)
Cohabiting	0.0850**	0.244**	0.419**
	(0.0415)	(0.123)	(0.199)
Never married	-0.0461***	-0.195***	-0.344***
	(0.0160)	(0.0601)	(0.105)
Household head does not have any disability	-0.0358**	-0.105**	-0.180**
	(0.0146)	(0.0439)	(0.0733)
Household head is chronically ill	0.0398***	0.123***	0.203***
	(0.0111)	(0.0334)	(0.0557)
Household size	0.0705***	0.209***	0.347***
	(0.00228)	(0.00737)	(0.0126)
Number of orphaned members	0.0524***	0.160***	0.261***
	(0.0199)	(0.0565)	(0.0946)
Protestant	0.00345	0.0110	0.0168

	(0.0154)	(0.0511)	(0.0869)
Pentecostal	0.0267*	0.0875*	0.150*
	(0.0139)	(0.0454)	(0.0768)
Apostolic Sect	0.119***	0.358***	0.598***
	(0.0146)	(0.0464)	(0.0781)
Zion	0.0845***	0.264***	0.439***
	(0.0216)	(0.0663)	(0.111)
Other Christian	0.0825***	0.253***	0.425***
	(0.0203)	(0.0624)	(0.104)
Islam	0.0675	0.209	0.345
	(0.0461)	(0.137)	(0.228)
Traditional	-0.0276	-0.123	-0.200
	(0.0401)	(0.151)	(0.263)
Other religion	0.0138	0.0433	0.0727
	(0.0327)	(0.109)	(0.185)
No religion	0.0308*	0.0911	0.151
	(0.0187)	(0.0616)	(0.105)
Bulawayo	0.0105	0.0347	0.0518
	(0.0124)	(0.0394)	(0.0663)
Manicaland	-0.0211	-0.0625	-0.108
	(0.0176)	(0.0556)	(0.0936)
Mash Central	-0.0281	-0.0929	-0.163*
	(0.0173)	(0.0577)	(0.0983)
Mash East	0.0172	0.0578	0.0947
	(0.0156)	(0.0494)	(0.0830)
Mash West	0.0570***	0.172***	0.287***
	(0.0149)	(0.0445)	(0.0736)
Mat North	0.150***	0.456***	0.745***
	(0.0195)	(0.0552)	(0.0923)
Mat South	-0.0322*	-0.0920	-0.180*
	(0.0180)	(0.0592)	(0.103)
Midlands	0.139***	0.406***	0.668***
	(0.0146)	(0.0419)	(0.0693)
Masvingo	0.00181	0.0175	0.0101
	(0.0149)	(0.0467)	(0.0790)
Constant	-0.0113	-1.478***	-2.426***
	(0.0273)	(0.0868)	(0.147)
Observations	13,269	13,269	13,269
R-squared	0.107		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

12. Treatment effects

12.1 Introduction

This section investigates the treatment effects of various treatment measures using Propensity Score Matching techniques described in Section 2.4 of this report. Section 11.2 below evaluates the treatment effects of social protection (Chapter 9), whereas Section 11.3 evaluates the treatment effects of urban agriculture (Chapter 6) on food and nutrition outcomes. Finally, Section 11.4 evaluates the treatment effects of WASH (Chapter 4) on nutritional outcomes.

12.2 PSM Estimates of Treatment Effects of Social Protection on Food and Nutrition Outcomes

In this chapter, interlinkages between selected variables (Government social support, UN/NGO support, and urban agriculture) and food and nutrition security variables are explored. PSM estimates in Table 53 indicate that *ceteris paribus* Government support was associated with an increase in the Household Dietary Diversity Score, consumption of vitamin A or iron rich foods at the 1% level of significance. Probably because Government support was concentrated in non-cash-based transfers, there was no statistically significant association with cereal insecurity in the urban setting because cereal insecurity is being based on income.

On the other hand, we counter intuitively observe a statistically significant positive association of UN/NGO support with increased cereal insecurity in the urban setting. The finding in this setting could be explained by the work/leisure effects that cash transfers bring to the urban population. Standard economic model of labour supply predicts that we should expect that when an individual suddenly receives an unexpected cash windfall in the form of cash transfers they should work less and earn less.[57] The health productivity channel which forms the basis of cash transfers predicts to the contrary. The health *productivity effect allows* undernourished workers to buy more food and better nutrients, which can allow them to earn more from each hour of work which subsequently increases their food security.[58] The latter behaviours are supported by the reduction in consumption or livelihoods coping strategies whereas the standard economic model is supported by the reduction in the food consumption score and household dietary diversity score.

[57] Baird, S., McKenzie, D. & Özler, B. The effects of cash transfers on adult labor market outcomes. *IZA J Develop Migration* **8**, 22 (2018). https://doi.org/10.1186/s40176-018-0131-9
[58] Ibid

Table 53: *Impact of Social support on food and nutrition security*

VARIABLES	(1) Cereal insecurity	(2) rCSI	(3) Coping behaviour	(4) FCS	(5) HDDS	(6) Consumption of protein rich foods	(7) Consumption of Vitamin rich foods	(8) Consumption of iron rich foods
Government support	0.00181	-0.0468	-0.0251	0.697	0.228***	-0.00257	-0.00360***	-0.00659***
	(0.0217)	(0.0306)	(0.0286)	(0.895)	(0.0811)	(0.00349)	(0.000718)	(0.00251)
UN/NGO support	0.114***	-0.189***	-0.101***	-5.480***	-0.599***	0.00207	-0.000625	-0.00174
	(0.0210)	(0.0209)	(0.0236)	(0.987)	(0.0809)	(0.00530)	(0.00205)	(0.00349)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

12.3 PSM Estimates of Treatment Effects of Urban Agriculture on Food and Nutrition Outcomes

Urban Agriculture is thought to increase food security through two main pathways: improved access to food, and increased income.[59] The first of these assumes that home-grown foodstuffs increase the total amount of food available to a household and thus can prevent hunger and malnutrition. At the same time the availability of fresh, home-grown food products, in particular fruits and vegetables, advances the nutritional status of household members and thereby impacts positively on health outcomes. Direct access to food allows households to consume a more diverse diet that is richer in valuable micronutrients. Animal husbandry is especially believed to provide an important source of animal protein, which is commonly limited in poor households' diets.[60]

Table 54 shows that the former path is not statistically significant since we do not observe urban agriculture reducing cereal insecurity, all things being equal. Moreso, because our approach to cereal insecurity in urban areas is more income based than production based. We however observe it to be associated with a decrease in consumption or livelihoods coping, all things being equal. We also observe it to be associated with an increase in the household dietary diversity score at the 1% level of significance all things being equal. Our findings therefore lend credence to the second channel.

[59] Mougeot LJA: Agropolis. The Social, Political and Environmental Dimensions of Urban Agriculture. London: IDRC; 2005.
[60] Korth et al.: What are the impacts of urban agriculture programs on food security in low and middle-income countries: a systematic review. Environmental Evidence 2014 3:21.

Table 54: *Impact of urban agriculture on food and nutrition security*

VARIABLES	(1) Cereal insecurity	(2) rCSI	(3) Coping behaviour	(4) FCS	(5) HDDS	(6) Consumption of protein rich foods	(7) Consumption of Vitamin rich foods	(8) Consumption of iron rich foods
urban agriculture	0.0005	-0.09***	-0.05**	0.9	0.25***	-0.0003	-0.002*	0.02
	(0.01)	(0.01)	(0.02)	(0.6)	(0.05)	(0.002)	(0.001)	(0.019)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

12.4 PSM estimates of treatment effects of WASH on nutrition outcomes

The findings in Table 55 indicate that all things being equal the possession of a handwashing station was marginally (10% level of significance) associated with a decrease in the decline in the incidences of diarrheal diseases. The failure to associate the improvements in the WASH outcomes could very likely be associated with the violation of the Stable Unit Treatment Value Assumption which would imply the incidences of spillovers.[61] It is highly probable that households without handwashing stations use those for households that do or that notwithstanding their usage of WASH facilities the outcomes for those households that possess WASH facilities are polluted by those that do not possess, given that the diseases are sometimes communicable.

Table 55: *Impact of WASH indicators on disease burden*

VARIABLES	Cough	Fever	Diarrhoea
Handwashing station	0.0283	0.00792	-0.0264*
	(0.0191)	(0.0162)	(0.0149)
Water at handwashing station	-0.0184	0.00389	0.000973
	(0.0200)	(0.0154)	(0.0151)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[61]Miguel, Edward, and Michael Kremer. 2004. "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." Econometrica 72 (1): 159-217.

13. Recommendations

Based on the findings from the 2023 Urban Livelihoods Assessment presented in this report, the following recommendations are put forward.

1. **Leverage on urban food systems to improve the food and nutrition security status of urban households.**

iv. The Government is commended for its efforts to improve food and nutrition security of the urban population through the implementation of programmes supporting urban agriculture. However, where policy allows, there is need to expand agricultural support for urban agriculture to improve the urban poor's consumption of a diversity of nutritious food, such as fruits and vegetables;

v. The findings from the assessment revealed that urban agriculture is not being impactful when one considers the income effect as evidenced by insignificant effect on cereal insecurity (which is based on income) but rather it is having an impact through availability. It is therefore important to boost the income effect so that is influences cereal security and this can be done through increasing access to markets or removing impediments to urban agriculture; and

vi. Strengthen urban-rural linkages and support value chains for perishable, high-value nutritious foods (including fruits and vegetables, dairy, poultry, and fish) to boost consumption of these foods by the urban population and improve on the diet quality of the urban households.

2. **Strengthen social safety nets to support the livelihoods, income, food security, and healthy diets of urban households and build resilience against seasonality, climate, health, and other shocks and vulnerabilities.**

iv. Providing targeted cash, food transfers, or vouchers for nutritious foods to poor urban households and strengthening food-based safety nets for the low-income earning and food insecure households who are vulnerable to critical levels of food deficit. Integration of safety nets within broader social protection strategies enables a more cohesive relief and development approach, as opposed to a relief to development continuum or more linear approach;

v. UN/NGO support which is mostly cash based has statistically significant positive association with food insecurity implying that the leisure/work effect might be at

play. It is therefore recommended that aid such as cash transfers to be in-kind or in terms of something that could be used for productive purposes; and

vi. Extending the school feed programmes to all urban areas, especially in high density areas, and provide free healthy school meals and educating school children in healthy diets and lifestyles. This is important given the fact that 23% of the children under 5 years were stunted, 6.9% were underweight, 2.9% were wasted and only 5.8% of the children were getting adequate diet.

3. Improving availability and quality of electricity and other alternative sources of energy.

iv. Given that most respondents pointed out that their main energy sources are not always available, there is need for Government to intensity efforts to improve energy supply in the country through a raft of measures which amongst others could include use of fiscal instruments to promote investment in and use of renewable energy.

v. More so, there is need for Government to consider improving the electricity subsidy regime to ensure that the cost of electricity allows the extremely poor households to access enough electricity to cover their basic needs. This can be done by for instance widening the first band in the stepped tariff system used by ZESA.

vi. In view of the gaps in knowledge on the interactions of energy and food and nutrition security in Zimbabwe, there is need to commission research on the same to inform policy and programming.

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