Zimbabwe Vulnerability Assessment Committee (ZimVAC)

Inter-linkages between HIV/AIDS and Food and Nutrition Security in Zimbabwe

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ZIMBABWE
Vulnerability
Assessment Committee

Table of Contents

FOREWORD 8
ACKNOWLEDGEMENTS 9
EXECUTIVE SUMMARY 10
i. Background characteristics 10
ii. Nutrition security and HIV/AIDS 12
In summary, the findings show no statistically significant difference in the WASH of the affected versus unaffected households before controlling for observed covariates. 16
iii. Food security and HIV/AIDS 17
iv. Treatment Effects 21
v. Conclusion and Recommendations for further research 22
Recommendations on improving the data collection tool 23
CHAPTER 1 25
Background25
1.1. Introduction 25
1.2. Context 25
1.3. Objectives of the desk study 26
1.3.1. Main objectives 26
1.3.2. Specific objectives 26
CHAPTER 2 28
Literature Review and Assessment Framework 28
2.1 Introduction 28
2.2 Impact of HIV/AIDS on nutrition 28
2.3 Impact of HIV/AIDS on food security 30
2.4 Exploring the linkages: Food and nutrition security and HIV/AIDS 32
CHAPTER 3 33
Methodology 33
3.1. Introduction 33
3.2 Data generation process 33
3.3 Sample size determination and description 33
3.4 Data analysis 33
CHAPTER 4 34
HIV/AIDS Statistics at the Household Level 34
4.1 Introduction 34
4.2 Proportion of households affected by HIV/AIDS 34
4.2.1 Rural versus disaggregation of households affected by HIV 34
4.2.2 Rural provincial disaggregation of the households affected by HIV/AIDS 35
4.2.3 Urban provincial disaggregation of the households affected by HIV/AIDS 36
4.2.3 Urban provincial disaggregation of number of household members infected by HIV/AIDS 39
4.3 Household level characteristics and HIV/AIDS infection 41
4.2.4 Background by HIV/AIDS status 41

4.2.5 Correlates of household characteristics and HIV status 41
4.2.6 Correlates of household characteristics and the number of household members infected by HIV/AIDS (Urban only) 46
4.4 Coping with HIV/AIDS in Zimbabwe 48
4.4.1. Descriptive analysis of coping with HIV/AIDS in Zimbabwe 48
4.4.3 Household characteristics and HIV/AIDS impact severity 51
4.4.4 Household characteristics and inability to cope with HIV/AIDS burden 53
4.4.5 Household characteristics and inability to recover from HIV burden 55
4.5 Adherence to HIV treatment protocol 57
4.6 Chapter Summary 59
4.6.1 Rural versus urban disaggregation of households affected by HIV/AIDS 59
4.6.4 Coping with HIV/AIDS in Zimbabwe 60
4.7 Recommendations for further research 61
CHAPTER 5 63
Nutritional Outcomes and HIV/AIDS 63
5.1 Introduction 63
5.2 Household consumption patterns 63
5.2.1 Adult number of meals 64
5.2.2 Food Consumption Score (FCS) 67
5.2.3 Household Dietary Diversity Score (HDDS) 71
5.2.4 Household Hunger Scale (HHS) 73
5.3 Malnutrition and illness in children 6-59 months by Household HIV/AIDS status 77
5.3.1 Descriptive analysis of malnutrition by household HIV/AIDS status 77
5.4 Morbidity in under 5 children 82
5.4.1 Descriptive analysis of incidence of diarrhoeal disease 82
5.4.2 Descriptive analysis of Cough 85
5.4.3 Descriptive analysis for the incidence of fever 88
5.5 Child nutrition and household HIV/AIDS status 91
5.5.1 Descriptive analysis for children under 5 ever breastfed 91
5.5.2 Descriptive analysis of breast-feeding advice by HIV/AIDS status 94
5.6 WASH and HIV status 96
5.6.1 Descriptive analysis for WASH 96
5.7 Chapter Summary 105
5.7.1 Household consumption patterns 105
5.7.2 Food Consumption Score (FCS) 105
5.7.3 Household Dietary Diversity Score (HDDS) 106
5.7.4 Household Hunger Scale (HHS) 107
5.7.5 Malnutrition and illness in children 6-59 months 107
5.7.6 Morbidity in under 5 children 108

Household HIV/AIDS status and the incidence of cough 108
Household HIV/AIDS status and the incidence of fever 109
5.7.7 Child nutrition and HIV status 110
Household HIV/AIDS status and children ever breastfed 110
Breastfeeding advice by household HIV/AIDS status 110
5.7.8 WASH and HIV/AIDS status 111
In summary, the findings in the table show no statistically significant difference in the WASH of the affected versus unaffected households before controlling for observed covariates 111
5.8 Recommendations for further research 112
CHAPTER 6 114
Food Security 114
6.1 Food security and HIV/AIDS status 114
6.2 Coping with Shocks and Stressors 118
6.2.1 Shocks and stressors in urban areas 118
6.2.2 Shocks and stressors in rural areas 124
6.3 Chapter Summary 133
6.3.3 Coping with Shocks and Stressors 134
Shocks and stressors in urban areas 134
6.3.4 Shocks and stressors in rural areas 135
6.4 Recommendations for further research 137
CHAPTER 7 138
Social Protection 138
7.1 Introduction 138
7.2 Social protection towards the affected 138
7.2.1 Descriptive analysis for Household HIV/AIDS status and social protection 139
7.3 Resilience of the affected households 147
7.3.1 Ability to lean on external parties 147
7.3.1.1 Descriptive analysis for HIV status and ability to lean on external parties 147
7.3.1.2 Correlates of HIV status and ability to lean on external parties . 148
7.4 Chapter summary 152
7.4.1 Analysis for HIV/AIDS status and social protection 152
7.5 Resilience of the affected households 154
7.5 Recommendations for further research 154
CHAPTER 8 155
Heterogeneity in the Treatment Effects of Government Support on Coping with HIV/AIDS Burden 155
8.1 Introduction 155
8.2 Heterogeneity in the treatment effect of government support on the severity of HIV/AIDS impact 155
8.3 Heterogeneity in the treatment effect of government support on household inability to cope with the HIV burden 156
8.4 Heterogeneity in the treatment effect of government support on household inability to recover from HIV/AIDS burden 156
8.5 Chapter Summary 158

8.5.1 Heterogeneity in the treatment effect of government support on the severity of HIV/AIDS impact 158
8.5.2 Heterogeneity in the treatment effect of government support on household inability to cope with the HIV burden 158
8.6 Recommendation 159
Chapter 9 160
Conclusion 160
9.1 Main conclusions 160
9.2 Recommendations for further research 160
9.3 Recommendations on improving the data collection tool 161

List of Tables

Table 1. Number of households affected by HIV/AIDS 34
Table 2. Rural provincial disaggregation of proportion of households affected by HIV/AIDS 35
Table 3. Decomposition of rural provincial disaggregation of proportions of households affected by HIV 36
Table 4. Urban provincial disaggregation of proportion of households affected by HIV/AIDS 37
Table 5. Decomposition of urban provincial disaggregation of proportions of households affected by HIV/AIDS 38
Table 6. Urban provincial disaggregation of number of household members infected by HIV/AIDS 39
Table 7. Decomposition of the average number of household members infected by HIV/AIDS 40
Table 8. Background characteristics by HIV/AIDS status 43
Table 9. Correlates of household background and HIV/AIDS status 45
Table 10. OLS estimates of correlates of household characteristics and the number of household members infected by HIV (Urban only) 47
Table 11. Rural versus urban household abilities to cope with HIV/AIDS 50
Table 12. Correlates of household characteristics and HIV/AIDS impact severity 51
Table 13. Correlates of household characteristics and inability to cope with HIV/AIDS burden 53
Table 14. Correlates of household characteristics and inability to recover from HIV/AIDS burden 55
Table 15. Proportion of households that missed HIV medicine 57
Table 16. Decomposition of provincial differences in the proportion of households that missed HIV medicines 58
Table 17. Adult number of meals by HIV/AIDS status of the household 64
Table 18. Relationship of household HIV status and number of adult meals 65
Table 19. Food Consumption Score Thresholds 67
Table 20. FCS by household HIV status 68
Table 21. Relationship of household HIV/AIDS status and FCS 69
Table 22. Household Dietary Diversity and household HIV/AIDS status 71
Table 23. Relationship of household HIV/AIDS status and HDDS 72
Table 24. Household hunger scale by household HIV/AIDS status 74
Table 25. Relationship of household HIV/AIDS status and HHS 75
Table 26. Stunting and underweight by household HIV/AIDS status 78
Table 27. Relationship of household HIV/AIDS status and stunting 78
Table 28. Relationship of household HIV/AIDS status and underweight children 81
Table 29. Incidences of diarrhoeal disease by HIV/AIDS status 82
Table 30. OLS estimates of the relationship of household HIV/AIDS status and the incidences of diarrhoeal 83
Table 31. Incidence of cough by household HIV/AIDS status 85
Table 32. Relationship of household HIV status and the incidence of cough 86
Table 33. Incidence of fever by household HIV/AIDS status 88

Table 34. OLS estimates of the relationship of household HIV/AIDS status and the incidence of fever 89
Table 35. Ever breast-fed children by HIV/AIDS status 91
Table 36. OLS estimates of the relationship of household HIV/AIDS status and children ever breastfed 92
Table 37. Breast feeding advice by HIV/AIDS status 94
Table 38. OLS estimates of the relationship of household HIV status and breast-feeding advice 94
Table 39. WASH by Household HIV/AIDS status 97
Table 40. Relationship of household HIV/AIDS status and access to improved water sources 98
Table 41. Relationship of household HIV/AIDS status and open defecation 100
Table 42. Relationship of household HIV/AIDS status and access to hand washing station 102
Table 43. Household food insecurity by Household HIV/AIDS status 115
Table 44. Correlates of household characteristics and food insecurity 116
Table 45. Ability to cope with shocks and stressors in by household HIV/AIDS urban areas 118
Table 46. Household abilities to cope with price increases 119
Table 47. Determinants of household ability to cope with price increases 120
Table 48. Household abilities to cope with rental increases 121
Table 49. Determinants of household ability to cope with rental increases 122
Table 50. Ability to cope with shocks and stressors in rural areas 124
Table 51. Ability to cope with loss of employment in rural areas 124
Table 52. Determinants of the ability of rural households to cope with loss of employment 125
Table 53. Ability to cope with death of breadwinner 127
Table 54. Determinants of the ability of rural households to cope with death of breadwinner 128
Table 55. Ability to cope with drought 130
Table 56. Determinants of the ability of rural households to cope with drought 131
Table 57. HIV status and social protection 139
Table 58. Correlates of HIV status and propensity to receive support from the government 140
Table 59. Correlates of HIV status and propensity to receive support from the UN/NGO 143
Table 60. Correlates of HIV status and propensity to receive support from the churches 145
Table 61. Household HIV/AIDS status and resilience 147
Table 62. Correlates of Household HIV/AIDS status and ability to lean on external parties 149
Table 63. Heterogeneity in the treatment effect of government support on HIV/AIDS impact severity 156
Table 64. Heterogeneity in the treatment effect of government support on household inability to cope with HIV burden 156

Table 65. Heterogeneity in the treatment effect of government support on household inability to recover from HIV/AIDS burden 157

List of Appendix

Appendix 1. Rural provincial disaggregation of the proportion of households affected by HIV 162
Appendix 2. Urban provincial disaggregation of the proportion of households affected by HIV 163
Appendix 3. Urban provincial disaggregation of the average number of household members infected by HIV 164
Appendix 4. Proportion of households with members that missed HIV medicines ... 165
Appendix 5. Rural decomposition 166
Appendix 6. Proportion of urban households affected by HIV/AIDS 167
Appendix 7. Medicines 168

FOREWORD

Food insecurity, undernutrition, and HIV/AIDS continue to be major problems in Zimbabwe. In 2018, the number of people living with HIV (PLWHIV) in Zimbabwe stood at 1.3 million. HIV incidence per 1,000 uninfected among all people of all ages was 2.79. Furthermore, the percentage of PLWHIV among adults (15–49 years) was 12.7% and 38 000 people were newly infected with HIV and 22 000 people died from an HIV/AIDS-related illness.

The Food and Nutrition Council (FNC), through Zimbabwe Vulnerability Assessment Committee (ZimVAC), has conducted a series of Rural and Urban Livelihoods Assessments (RLAs and ULAs) since 2002 and the assessment reports have informed both the public and private sector on issues related to context and profiles of household level food security and vulnerability. However, the relationship between HIV infection and increased susceptibility and vulnerability although generally being acknowledged has not been clearly mapped out in previous ZimVAC assessments. Although tools to collect such information have been incorporated in the ZimVAC Rural and Urban Livelihoods Assessments (RLAs and ULAs), the analysis has not incorporated detailed analysis of interconnectedness of HIV/AIDS and food and nutrition security issues. It is with this background that the FNC conducted a literature review of the ZimVAC and other relevant assessments and the analysis of ZimVAC data that has been collected in recent years in order to map out HIV/AIDS and livelihood trends.

We want to express our profound gratitude to Government Ministries and Development Partners for their support in conducting the data analysis and generating this report. Financial support and technical leadership were received from the Government of Zimbabwe and WFP. Without this support, the data analysis and this report would not have been produced.

It is our hope that this report will light your way as you search for lasting measures in building resilience of many of our rural and urban households vulnerable to food and nutrition insecurity.

George Kembo (Dr)
FNC Director/ZimVAC Chairperson

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Food and Agriculture Organization (FAO)	Organization of Rural Associations for Progress (ORAP**)**	United Nations Children's Fund (UNICEF)
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HOCC	Rural District Councils	Amalima
Catholic Relief Services (CRS)	National AIDS Council (NAC)	World Vision
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EXECUTIVE SUMMARY

The relationship between HIV infection and increased susceptibility and vulnerability although generally being acknowledged has not been clearly mapped out in previous ZimVAC assessments. Although tools to collect such information have been incorporated in the ZimVAC Rural and Urban Livelihoods Assessments (RLAs and ULAs), the analysis has not incorporated detailed analysis of the interconnectedness of HIV/AIDS and food and nutrition security issues. The main objective of the desk study was therefore to establish the inter-linkages between HIV/AIDS and food and nutrition outcomes for rural and urban households in Zimbabwe with the aim to guide the development of evidence-based HIV/AIDS policies and intervention programmes.

This report deepens the analysis and gives some insights into the interlinkages between food and nutrition security and HIV/AIDS in Zimbabwe. A structured household questionnaire and a community focus group discussion questionnaire were used as the two primary data collection instruments. The RLA primary data collection took place from 10th to the 24th of May 2019 whilst the ULA primary data collection took place from 12th to the 23rd of August 2019. The consolidated data includes all common variables in the rural and urban questionnaires. Results of data analysed showed the following:

i. Background characteristics

Demographic characteristics

Nationally, 13.6% of the households surveyed had at least one person in the household who was HIV positive and the rural versus urban disaggregation shows that 16.4% of rural households had at least one member who was infected by HIV compared to 9.7% of the urban households. Further analysis revealed that Matabeleland North (23.7%), Matabeleland South (22.5%), Midlands (17.5%), Masvingo (16.6%) were the top four rural provinces with households affected by HIV/AIDS. For urban provinces, Bulawayo (13.6%) and Midlands provinces (11.3%) had the highest prevalence of HIV/AIDS affected households while Mashonaland East (6.2%) and Mashonaland Central (7.8%) had the lowest HIV/AIDS affected households for the urban provinces. The disaggregation of number of household

members infected by HIV revealed that Midlands province had the highest number (1.488) of household members infected by HIV and Bulawayo had the lowest (1.350) in the 2019 RLA. There is no significant difference between the national average of 13.6% and the national average of 13.3% reported by the National Aids Council (NAC) in 2018. However, the provincial disaggregation is not comparable as data used in this analysis is not at individual level as that used in the NAC report.

Household level characteristics and HIV/AIDS infection

The results showed that female headed households are mostly likely to be affected by HIV/AIDS than male headed households and heads of households that are affected by HIV/AIDS tend to be older and are less likely to be married or reside with their spouse. In addition, households that are affected by HIV/AIDS tend to have household heads that are less educated and also tend to have less income. Moreover, the results indicate that increasing household income is associated with a decrease in the probability of the household being affected by HIV/AIDS while increasing household size increases the probability of the household being affected by HIV/AIDS. The results also revealed that religion has an influence as the religion dummies indicated that Pentecostal and Apostolic sect members are less likely to be affected by HIV/AIDS while households without religion were associated with an increase in the probability of having a household member with HIV/AIDS. More so, the results revealed that Islam religion is associated with a decrease in the number of urban household members infected by HIV/AIDS.

Coping with HIV/AIDS in Zimbabwe

Regarding the ability of HIV/AIDS affected households to cope with the HIV/AIDS burden, the results indicate that HIV/AIDS affected households located in rural areas are 20.6% less likely to perceive the HIV/AIDS infection of a household member to be severe and are 16.9% more likely to cope with the burden of HIV/AIDS than their urban counterparts. More so, HIV/AIDS affected rural households have an increased likelihood of being able to cope with a future infection in the household than their urban counterparts. In addition, the results show that an increase in household income of an HIV/AIDS affected household by 1% is associated with a decline in the probability that the household is not able to cope with the burden of HIV/AIDS.

Relating to the ability to recover from the HIV/AIDS burden, the results show that female headed households are more likely to be unable to recover from the HIV/AIDS burden than their male counterparts. More so, households located in the rural areas are associated with an increased ability to recover from the HIV/AIDS burden than their urban counterparts.

ii. Nutrition security and HIV/AIDS

Food Consumption Patterns

Number of adult meals

The results indicate that HIV/AIDS affected households consume less number of adult meals (2.224) than their unaffected counterparts (2.325). There is an association between HIV/AIDS household status and adult number of meals; at the 1% level of significance, households with PLWHIV have an increased probability to consume 0.0359 less number of adult meals. The results also indicate that rural households consume 0.168 more adult meals than their urban counterparts while increasing household income by 1% increases consumption of adult meals by 0.0255. The results further reveal that increasing the age of household head by 1% increases the likelihood of the household consuming 0.126 less number of adult meals than the unaffected households. In addition, female-headed affected households are likely to have an increased number of adult meals by 0.0519 at the 1% level of significance. More so, increasing the education of the household head increases the probability of the household consuming an increased number of adult meals. For example, attainment of A' Level and Graduate/Post-Graduate by the household head increases the adult number of meals by 0.186 and 0.300.

Food Consumption Score (FCS)

At least 54.3% of HIV/AIDS unaffected households had an acceptable food consumption score versus the 41.9% for the affected households. More so, 31% of the affected households had borderline (31%) and poor (27.1%) food consumption scores than their unaffected counterparts, 26.2% and 19.5%, respectively. The results showed that HIV/AIDS affected households are 5.88% less likely to achieve an acceptable FCS than unaffected households. The result also revealed that an increase in the age and education level of the household head and income of the household increases the likelihood of HIV/AIDS affected households having an

acceptable FCS. More so, households that are members of the Apostolic Sect, Zion and Traditional religion, have the probability of achieving an acceptable FCS lowered by 5.76%, 5.55% and 9.22%, respectively. Increasing the age of the household head by 1%, increases the probability of the affected household achieving an acceptable FCS by 0.118%, while attaining Graduate/Post-Graduate level increases the probability of achieving an acceptable FCS by 20.6% at the 1% level of significance. Lastly, the results indicate that affected households located in the rural areas have a 12.75 increased probability of achieving an acceptable FSC.

Household Dietary Diversity Score (HDDS)

The results revealed that 55.49% of the unaffected households had an acceptable HDDS versus 52.03% of the HIV/AIDS affected households. The findings indicate that households that are affected by HIV/AIDS on average consume less food groups than households that are not affected by HIV/AIDS before controlling for observed confounders. The results show that households with a member who is HIV positive are 13.2% less likely to achieve an acceptable HDDS while female headed households and increasing age and education level of household head increases the probability of the affected household achieving an acceptable HDDS. For example, the result indicates that increasing the age of household head by 1% increases the probability of the household achieving an acceptable HDDS by 0.48% and by 13.6% if the household head is female, *ceteris paribus*. The provincial dummies indicate that in comparison to the base province of Bulawayo, save for Matabeleland North province, all the other provinces have an increased likelihood of achieving an acceptable HDDS.

Household Hunger Scale (HHS)

The results revealed that HIV/AIDS affected households are in more hunger than unaffected households in terms of all components of the household hunger score by a factor of 0.128 points. More so, households with an HIV positive member have an increased probability for an increased household hunger by 0.0865 points. The same trend was observed if the household head is divorced/separated (0.0920 points) and if there is an increase in household size (0.0226). Furthermore, the results show that increasing household income by 1% reduces the HHS for the HIV/AIDS affected household by 0.102 points and attainment of Graduate/Post-Graduate education

level is likely to reduce the HHS of the HIV/AIDS affected household by 0.233 points, all things being constant.

Malnutrition and illness in children 6-59 months

HIV/AIDS affected households had more stunted children (27.7%) than those in unaffected households (23.6%) and also had more underweight children (9.9%) as compared to unaffected households (8.3%), mean differences are statistically valid at the 1% level of significance. Households that are affected by HIV/AIDS are 4.08% more likely to have under 5 children who are stunted at the 1% level of significance. Increasing the age of the household head by 1% reduces the likelihood of stunted children by 0.15% and attainment of Graduate/Post-Graduate qualification reduces the chances of stunted children by 7.68%. Furthermore, the results show that living in the rural areas reduces the probability of having stunted children by 4.54%. The inferential analysis of underweight and household HIV/AIDS status indicate that increasing household income reduces the probability of children being underweight by 0.644% while an increase in household size increases the probability of underweight children by 0.687%. More so, increasing the age of the household head by 1% reduces the probability of underweight children by 0.058 at 5% level of significance.

Morbidity in under 5 children

Household HIV/AIDS status and the incidence of diarrhoea

The findings point to statistical homogeneity in the incidences of diarrhoeal diseases before controlling for observed confounding variables. After controlling for observed confounders, the results reveal that at 10% level of significance, a child from an HIV/AIDS affected household is 1.53% more likely to suffer from diarrhoea. An increase in household income and age and education level of household head decreases the likelihood of the incidence of diarrhoea. In addition, the results show that increasing income of an HIV/AIDS affected household by 1% is likely to reduce the incidence of diarrhoea by 1.21%. More so, attainment of Graduate/Post-Graduate qualification by the household head reduces the incidence of diarrhoea by 7.36% at the 1% level of significance. Marital status in all its forms and an increase in household size are likely to increase the incidence of diarrhoea in the HIV/AIDS affected households.

Household HIV/AIDS status and the incidence of cough

The difference in the incidence of cough between affected and unaffected households is not statistically significant at 1% level of significance. However, 29.6% of the children in the HIV/AIDS affected households suffered from cough two weeks prior to the survey while in the unaffected households it was 28.4% of the children. Furthermore, children from HIV/AIDS affected households located in the rural areas are 5.415% less likely to suffer from cough, at 1% level of significance, than their counterparts located in urban areas. Increasing the age of the household head by 1% is likely to decrease the incidence of cough by 0.537%, while attainment of a Diploma/Certificate after primary education reduces the incidence of cough in the HIV/AIDS affected households by 12.6% at the 1% level of significance. However, increasing household size by 1% is likely to increase the incidence of cough by 3.17% at the 1% level of significance.

Household HIV/AIDS status and the incidence of fever

At least 20% of the children in the affected rural households suffered from fever two weeks prior to the survey while in the affected urban households it was 19% of the children. However, the difference in the incidence of fever between HIV/AIDS affected and unaffected households is not statistically significant at 1% level of significance. The results also reveal that increasing the child's age by 1% is likely to decrease the incidence of fever by 0.3587%, while increasing household income by 1% is likely to reduce the incidence of fever by 1.07%. Children from HIV/AIDS affected households located in the rural areas are 2.74% less likely to suffer from fever than a child in urban areas. In addition, the results show that increasing household size by 1% is likely to increase the incidence of fever by 2.31% at the 1% level of significance.

Child nutrition and HIV status

Household HIV/AIDS status and children ever breastfed

The results reveal no statistically significant difference in the average number of under 5 children that were ever breastfed between the HIV/AIDS affected

households and those that are not affected before controlling for observed confounding variables. After controlling for confounding variables, there is no statistically significant difference in the average number of children that were ever breastfed between households that are affected by HIV/AIDS and those that are not affected. However, the results show that increasing the age and education of the household head and of household income, reduces the likelihood that children under 5 years are breastfed, at the 1% level of significance.

WASH and HIV/AIDS status

In summary, the findings show no statistically significant difference in the WASH of the affected versus unaffected households before controlling for observed covariates.

Access to improved water facilities

The difference in access to improved water sources between HIV/AIDS affected households versus the unaffected households is not statistically valid at the 1% level of significance. The results show that 78.8% of the HIV affected households had access to improved water sources versus the 81.7% of the unaffected households. The results also reveal that female headed households, increasing age and education level of the household head and increasing household income increase the likelihood of HIV/AIDS affected households accessing improved water facilities. For example, a female headed household has a 3.03% increased probability of accessing improved water facilities and increasing household income by 1% increases the probability of the household accessing improved water facilities by 10.2% at the 1% level of significance. However, HIV/AIDS affected households that are members of the Apostolic Sect have a 3.16% reduced probability of accessing improved water facilities. More so, HIV/AIDS affected households in the rural areas have a 17.5% reduced probability of accessing improved water facilities.

Practicing open defecation

The results show that 24.0% of the affected households practiced open defecation whilst for unaffected households, it is 17.5%. The results show that female headed households have a 2.49% reduced likelihood of practicing open defecation and attainment of Graduate/Post-Graduate qualification by the household head increases the probability of the household not practicing open defecation by 7.78%. However, the results reveal that households located in the rural areas are 24.9%

more likely to practice open defecation and that HIV/AIDS affected households that are members of the Apostolic Sect, Zion and those that practice traditional religion have a higher probability of practicing open defecation.

Access to hand washing station

The results indicate that 22.5% of the affected households had access to a hand washing station whilst 31.7% of the unaffected did not have access. Moreover, the results indicate that households with an HIV positive member have a reduced probability of accessing a hand washing station by 7.46% at the 1% level of significance. HIV/AIDS affected households located in the rural areas have a 17.1% reduced likelihood of accessing hand washing stations as compared to their urban counterparts. In addition, the results show that the probability of HIV/AIDS affected households accessing hand washing stations increase as the age and education of household head increases, when household head is female, when household size and income increase.

iii. Food security and HIV/AIDS

Food *insecurity status of HIV/AIDS affected households*

Nationally, 62.1% of the surveyed households were food insecure. The disaggregation by the household HIV/AIDS status show that 76.2% of affected households were food insecure and whilst for the unaffected households it was 59.9%.

Household characteristics and food insecurity

The results reveal that a household with an HIV positive member has a 2.62% increased likelihood of being food insecure than their unaffected counterparts. More so, increasing household size increases the likelihood of the household being food insecure by 3.07% while living in the rural areas increases the likelihood of being food insecure by 41%. Furthermore, the results show that increasing education level of household head increases the likelihood of a household being food secure. For example, attaining A' Level by the household head is likely to reduce food insecurity by 4.33% and by 4.40% when one attains Graduate and Post-Graduate level. Increasing household income by 1% decreases the probability of the household being food insecure by 11.6% at the 1% level of significance.

Coping with price increases (Urban households only)

The results show that 96% of the HIV/AIDS affected households indicated the impact of price increases to be severe as compared to 92% of unaffected households that reported the same. More so, at least 62.8% of the affected households are not able to cope and 37.5% not able to recover from the impact of price increases. For the unaffected households, 56.9% are not able to cope and 36.3% did not recover from the price increases. However, there is no statistically significant association between household HIV/AIDS status and price increases. The results reveal an increased likelihood of severe impact of price increases in households that are female headed (2.07%), practice Traditional religion (7.43%), have no religion (3.75%) and have an increase in household size (0.603%). More so, the impact of price increases is likely to be high for households in Manicaland (4.37%), Mashonaland West (4.41%), Matabeleland South (3.53%) and Masvingo provinces (5.08%). The results also reveal that increasing age of household head by 1% increases the probability of the household coping with price increases by 0.17% at the 1% level of significance. However, increasing household income by 1% is likely to reduce the impact of price increases by 5.60%.

Rental increases (Urban households only)

There is a weakly association between household HIV/AIDS status and impact of rental increases. At the 5% level of significance, households with an HIV positive member have an 8.54% probability of not being able to recover from rental increases.

Increasing the age of the household head by 1% is likely to increase the severity of rental increases by 0.19% and increases the inability of the affected household to cope with the rental increases by 0.463% at the 1% level of significance. The results further show that households with heads that achieved Primary education only have an increased likelihood of not being able to recover from rental increase by 24.7% at the 1% level of significance. Increasing household size indicates to have the propensity to increase the severity of the rental increases on the HIV/AIDS affected households. Moreover, the results indicate that increasing household income is most

likely to reduce the impact of increasing rent by 2.11%, the ability of the household to cope with price increases by 4.09% and the ability to recover from the price increases by 2.99% at the 5% level of significance.

Loss of employment (rural households only)

The results show that HIV/AIDS affected households are 1.88% more likely to have its member lose employment as compared to an unaffected household. Furthermore, the results indicate that increasing education level of household head reduces the likelihood of losses of employment, e.g. attaining Graduate/Post-graduates level reduces the probability of loss of employment by 2.18% at the 1% level of significance. Belonging to Islam religion reduces the probability of the household to cope with loss of employment by 53.2% at the 1% level of significance. The results also show that household heads that are married and living together with their spouse are 72.6% less likely to recover from loss of employment at the 1% level of significance. Increasing household income reduces the ability of the affected household to cope with the loss of employment by 7.56% at the 1% level of significance.

Death of breadwinner (rural households only)

The results reveal that HIV/AIDS affected households have a 29.4% increased inability to recover from the death of the breadwinner. More so, increasing household income by 1% reduces household's inability to recover from the death of a breadwinner by 8.83% while households that are members of the Islam religion have a 50.3% increased likelihood of not being able to recover from the death of the breadwinners as compared to households that are members of other religions.

Drought (rural households only)

The results indicate a statistically significant difference at the 1% level of significance in the impact of drought between HIV/AIDS affected and not affected households. At least 90.7% of the HIV/AIDS affected households were affected by drought as compared to 87.65% of the HIV/AIDS unaffected households. Increasing the education level of the household head from Primary up to O' Level increases the ability of the household to cope with drought. More so, an increase in household income reduces the severity of drought by 3%, it also reduces the inability to cope and inability to recover from drought by 4.69% and 2.95% respectively. In addition,

the results show that the severity of drought is increased by 5.8% and 8.17% for members of the Apostolic Sect and those that practice Traditional religion respectively. Increasing the age of the household head by 1% reduced the inability of the household to recover from drought by 0.178%.

HIV status and social protection

The results show that the Government of Zimbabwe is the biggest provider of social support as it supported 44.1% of the HIV/AIDS affected households. Urban relatives are the second biggest provider of social support (18.6%) followed by relatives in the rural areas (15.3%) and then the UN/NGOs (13.5%).

Propensity to receive support from the Government

Although the results reveal no statistically significant association between household HIV/AIDS status and propensity to receive social support from Government, robustness check display weakly significant positive association between household status and propensity to receive support from government. This could probably be because government support is mainly targeted at crop and livestock support. The results show that households headed by females have an increased propensity to receive social support from Government, everything being constant. This result is reflected when there is an increase in household income and age of household head. Being located in the rural areas also increases the propensity to receive social support from Government. However, increasing the education level of the household head reduces the propensity of the HIV/AIDS affected household to receive social support from the Government by 4.27% at the 5% level of significance.

Propensity to receive support from the UN/NGOs

The results show that at the 5% level of significance, a household with an HIV positive member has a 1.47% more likelihood to receive social support from UN/NGO. An increase in the education level of the household head reduces the propensity of the household to receive support from UN/NGOs at an increasing rate. For example, attainment of A' Level reduces the propensity to receive support by 4.46% and by 5.19% for attaining a Diploma/Certificate after secondary. The results further show that HIV/AIDS affected households that are members of Zion have an increased propensity to receive social support from UN/NGOs. This result may be due to the fact that the district being supported by the UN/NGOs is dominated by Zion religion

and not necessarily that the UN/NGO were targeting households belonging to this religion.

Propensity to receive support from the churches

The results reveal very weak association of household HIV/AIDS status and the propensity to receive support from churches. Increasing the age of household head by 1% increases the likelihood of the affected household receiving social support and female and widow/widower headed households have a 0.814% and 6.06% increased probability to receive social support respectively, at the 5% level of significance.

Resilience of the affected households

The results show that households that are affected by HIV/AIDS felt they were more able to lean on the Government and UN/NGOs more than their counterparts that are not affected by HIV/AIDS before controlling for confounding variables. Furthermore, the results indicate that households that are affected by HIV/AIDS are 30.7% more likely to be able to lean on UN/NGO than their counterparts that are not affected after controlling for observed confounders and they are 1.89% less likely to be able to lean on friends and relatives in the diaspora than their counterparts that are not affected.

iv. Treatment Effects

Effect of Government support on the severity of HIV/AIDS impact

The results show that receiving Government support reduces the severity of the impact of HIV/AIDS on the household by 7.92% at the 5% level of significance. Considering rural households alone, the probability that the household felt severe impact of having a household member infected by HIV/AIDS in the year of the survey reduces by 9.43% at the 5% level of statistical significance. The sum total of the findings is that Government support reduced the severity of the impact of having a household member being infected by HIV/AIDS more in rural areas than in urban areas. This result is due to more Government support and programmes being targeted at rural areas than urban areas. This finding is consistent with the findings in Chapter 4.

Effect of Government support on household inability to cope with the HIV burden

The results revealed that Government support is not statistically valid in reducing the inability of the household to cope with the HIV/AIDS burden both at the national level and in rural areas alone.

Effect of Government support on household inability to recover from HIV/AIDS burden

At national level, Government support is associated with the reduction in the probability that the household is unable to recover from the HIV/AIDS burden of 6.04% at the 10% level of significance. The impact of Government support on reducing the inability of households to recover from the HIV/AIDS burden is however not statistically valid. The conclusion to be reached from the results is that Government support reduces the probability that the household is unable to cope with the HIV/AIDS burden more in urban areas than in rural areas.

v. Conclusion and Recommendations for further research

This report presented some insights into the interlinkages between food and nutrition security and HIV/AIDS in Zimbabwe. The findings are summarised under each chapter of this report. The results indicate interesting associations between household HIV/AIDS status and food and nutrition security:

(i) At least 13.6% of the households surveyed had at least one person in the household who was HIV positive.

(ii) There were more affected households in rural areas than urban areas.

(iii) HIV/AIDS affected households were more food insecure than unaffected households.

(iv) There was no statistically significant difference in the WASH of the affected versus unaffected households.

(v) HIV/AIDS affected households were in more hunger than unaffected households.

(vi) Government support reduced the severity of HIV/AIDS more in rural areas than in urban areas.

Further research

The findings reveal some gaps in the following areas:

i. The analysis was conducted at household level as there is no identifier for the HIV positive individual in a household.

ii. There is need to get in-depth insights by answering the WHY questions as to the observed trends and patterns, for example:
    - Why HIV/AIDS affected households located in the rural areas are more able to cope but not able to recover from stress and shocks as compared to their urban area counterparts?

iii. It is strongly recommended that some case studies be conducted in a few clinics, affected households and HIV/AIDS known hotspots to answer the WHY questions emanating from the results of this secondary data analysis. Some of the observed trends need to be explored further to establish factors influencing the trend of the observed results.
    - Such case studies will give in-depth insights and in-depth understanding into the possible factors influencing impact, coping and recovering ability by the HIV/AIDS affected households.
    - More so, there is need for further research on access to health facilities and availability of medicines in the health facilities.
    - Such information is key to develop appropriate intervention strategies and development of effective policy.

iv. There is need to get in-depth insights as to the lack of statistically significant difference between breastfeeding and non-breastfeeding women in HIV/AIDS affected and unaffected households. For more conclusive results, there is need to identify the HIV positive in the household.

v. Overall, there is need for more research or data analysis on the impact of the different intervention programmes being implemented in the country on food and nutrition security and coping ability of the HIV/AIDS affected households to the various shocks and stressors.

Recommendations on improving the data collection tool

It is recommended to include a separate section on HIV in the ZimVAC tool with

questions that capture the following information:

i. *if possible,* gender and age group of the affected individual(s) within the household. This enables analysis at individual level;
ii. access to health and counselling services;
iii. availability of medicines at the nearest health facility;
iv. availability of medical personnel at the nearest health facility;
v. access to information and education on HIV/AIDs;
vi. number of HIV/AIDs related deaths in the household.

Adding questions that provide the above information will enable an in-depth analysis of the interlinkages between HIV/AIDS and food and nutrition security in Zimbabwe.

CHAPTER 1

Background

1.1. Introduction

The Food and Nutrition Council (FNC), through Zimbabwe Vulnerability Assessment Committee (ZimVAC), supports the Government in: (i) convening and coordinating national food and nutrition security issues in Zimbabwe; (ii) charting a practical way forward for fulfilling legal and existing policy commitments in food and nutrition security; (iii) advising Government on strategic directions in food and nutrition security; (iv) acts as a custodian in supporting and facilitating action to ensure commitments in food and nutrition are kept on track by different sectors. ZimVAC undertakes food and nutrition assessments, analysis and research; promotes multisectoral and innovative approaches for addressing food and nutrition security and; supports and builds national capacity for food and nutrition security including at sub-national levels.

The ZimVAC has conducted a series of Rural and Urban Livelihoods Assessments (RLAs and ULAs) since 2002. The assessments were aimed at understanding the food security and livelihoods situation in Zimbabwe in order to identify rural populations and urban areas that were food insecure during the consumption years. The ZimVAC vulnerability assessment reports have informed both the public and private sector on issues related to context and profiles of household level food security and vulnerability. The main findings of these reports have been used for decision making, especially in the identification of community needs, planning and formulation of both short- and medium-term interventions.

1.2. Context

Food insecurity, undernutrition, and HIV/AIDS continue to be major problems in developing countries[1]. The HIV/AIDS epidemic is having a devastating impact on human and economic development, food security and nutritional status, particularly in poor communities, and most noticeably in Sub-Saharan Africa. In 2017, Zimbabwe

[1] Anema et al. Food Security in the Context of HIV: Towards Harmonized Definitions and Indicators. AIDS Behav 18, 476–489 (2014).

had the fifth highest HIV prevalence in Sub-Saharan Africa where 14.7% (1.33 million people) of adults aged 15-49 years in Zimbabwe were living with HIV, the majority of whom were women (700,000 women are HIV+), and there were approximately 39,000 annual deaths from AIDS, whilst there were 180,000 children living with HIV/AIDS[2]. In 2018, people living with HIV in Zimbabwe stood at 1.3 million. HIV incidence per 1,000 uninfected among all people of all ages was 2.79 in 2018. Furthermore, the percentage of PLWHIV among adults (15–49 years) was 12.7%, 38 000 people were newly infected with HIV and 22 000 people died from an HIV and AIDS-related illness. According to UNAIDS, the number of new HIV infections has fallen from 62,000 to 38,000.

The relationship between HIV infection and increased susceptibility and vulnerability although generally being acknowledged has not been clearly mapped out in previous ZimVAC assessments. Although tools to collect such information have been incorporated in the ZimVAC Rural and Urban Livelihoods Assessments (RLAs and ULAs), the analysis has not incorporated detailed analysis of interconnectedness of HIV/AIDS and food and nutrition security issues. It is with this background that ZimVAC proposed a consultancy to guide and lead a ZimVAC technical team to conduct a literature review of the ZimVAC and other relevant assessments and the analysis of ZimVAC data that has been collected in recent years in order to map out HIV/AIDS and livelihood trends.

1.3. Objectives of the desk study

1.3.1. Main objectives

The main objective of the desk study is to establish the inter-linkages between HIV/AIDS and food and nutrition outcomes for rural and urban households in Zimbabwe with the aim to guide the development of evidence-based HIV/AIDS policies and intervention programmes. In addition, the desk study is aimed at enhancing the capacity of ZimVAC technical team members on assessing and analysing HIV and AIDS as a vulnerability factor on livelihoods.

1.3.2. Specific objectives

To fulfil the two main objectives stated above, the following six specific objectives will be tackled;

[2] UNAIDS, Eastern and Southern Africa HIV Epidemic Profile, 2014

1. Determine nutritional outcomes among HIV positive persons or households living with an HIV positive person.
    - Household consumption patterns
    - Minimum dietary diversity for women
    - Infant and young child feeding practices
    - Child nutrition status and child morbidity
    - Maternal health
    - Water, sanitation and hygiene
    - Access to health services
2. Determine food insecurity among HIV positive persons or households living with an HIV positive person.
    - Food Security
    - Livelihood based coping strategies
    - Income and expenditure
    - Shocks and stressors
3. Determine the risk factors that contribute to malnutrition in HIV positive persons or affected households.
4. Establish the inter-linkages between HIV/AIDS and food and nutrition outcomes.
5. Establish the impact of food and nutrition intervention programmes on the nutritional outcomes among HIV positive persons or households living with an HIV positive person.
6. Establish the impact of social protection on the food and nutrition outcomes of households living with an HIV positive person.

CHAPTER 2

Literature Review and Assessment Framework

2.1 Introduction

HIV/AIDS has increasingly been recognised as a crosscutting multisectoral issue that should be taken into account at every level of development policy and planning, affecting upon all types of assets, i.e. human, financial, social, physical, natural and capital, as well as information related and political assets. HIV/AIDS has a major impact on household food and nutrition security. The burden of ill-health and death as a result of HIV/AIDS impacts on livelihoods, depleting human capital, disrupting social support networks, institutions and both formal and informal organisations, thereby limiting or undermining livelihood opportunities, productivity and social support mechanisms[3]. In this section, based on literature, we unravel the linkages between HIV/AIDS and food and nutrition outcomes as the basis for the data analysis in the next chapters.

2.2 Impact of HIV/AIDS on nutrition

HIV/AIDS can have a disastrous effect on household food and nutrition security[4]. The relationship between HIV/AIDS and nutrition is multifaceted, multidirectional. HIV/AIDS is a vicious cycle as it can cause or worsen undernutrition by causing reduced food intake, increased energy requirements, and poor nutrient absorption. Several studies have shown that nutritional status and HIV/AIDS are inter-related. For example, lack of proper nutrition compromises the health status of pregnant and lactating mothers, thereby increasing the chance of mother-to- child transmission of the virus during birth and during breastfeeding. Evidence shows that adherence to Antiretroviral Therapy (ART) and its efficacy are significantly influenced by access to adequate food and nutrition[5,6,7]. These studies reported that poor nutrition reduces the body's ability to fight infections and therefore helps increase the incidence,

[3] Ivers et al. (2009). HIV/AIDS, Undernutrition, and Food Insecurity, Clinical Infectious Diseases 2009; 49:1096–1102

[4] Moyo et al. (2017). Food challenges facing people living with HIV/AIDS in Zimbabwe, African Journal of AIDS Research, 16:3, 225-230

[5] Young et al. (2014). A review of the role of food insecurity in adherence to care and treatment among adult and pediatric populations living with HIV and AIDS. AIDS and behaviour, 18 Suppl 5(0 5), S505–S515.

[6] Berhe, et al. (2013). Effect of nutritional factors on adherence to antiretroviral therapy among HIV-infected adults: a case control study in Northern Ethiopia. BMC infectious diseases, 13, 233.

[7] Weiser et al. (2010) Food Insecurity as a Barrier to Sustained Antiretroviral Therapy Adherence in Uganda. PLoS ONE 5(4).

severity, and length of infections. Figure 1 depicts the multifaceted, multidirectional and vicious cycle relationship between HIV and nutrition.

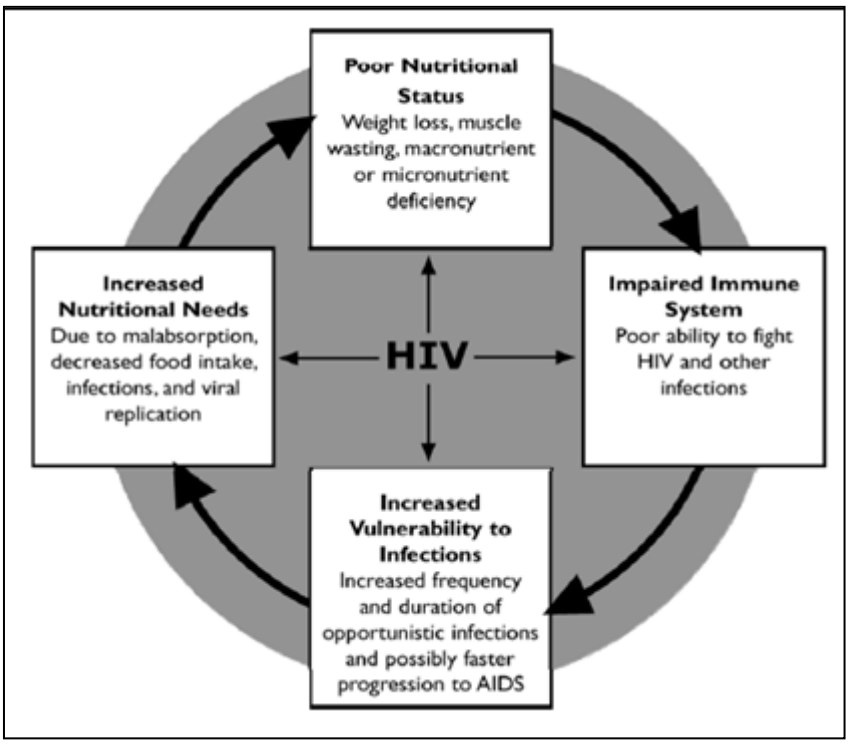


Figure 1. The multifaceted, multidirectional and vicious cycle relationship between HIV and nutrition.

Several nutrition interventions have been implemented in Zimbabwe to fight the HIV/AIDS epidemic[8]. Figure 2 illustrates how effective nutrition interventions can help transform the vicious cycle of HIV and undernutrition into a positive relationship between improved nutritional status and stronger immune response.

For the nutrition interventions to be more effective there is need:

i. for an in-depth review of available evidence and establishment of nutritional requirements relevant to HIV/AIDS,
ii. to integrate HIV/AIDS in intersectoral food and nutrition plans and policies,
iii. to incorporate food and nutrition considerations in national HIV/AIDS programmes, and
iv. to strengthen food and nutrition interventions in emergencies and humanitarian crises where there is a high prevalence of HIV/AIDS.

[8] Chevo and Bhatasara (2012) HIV and AIDS Programmes in Zimbabwe: Implications for the Health System. International Scholarly Research Notices / 2012

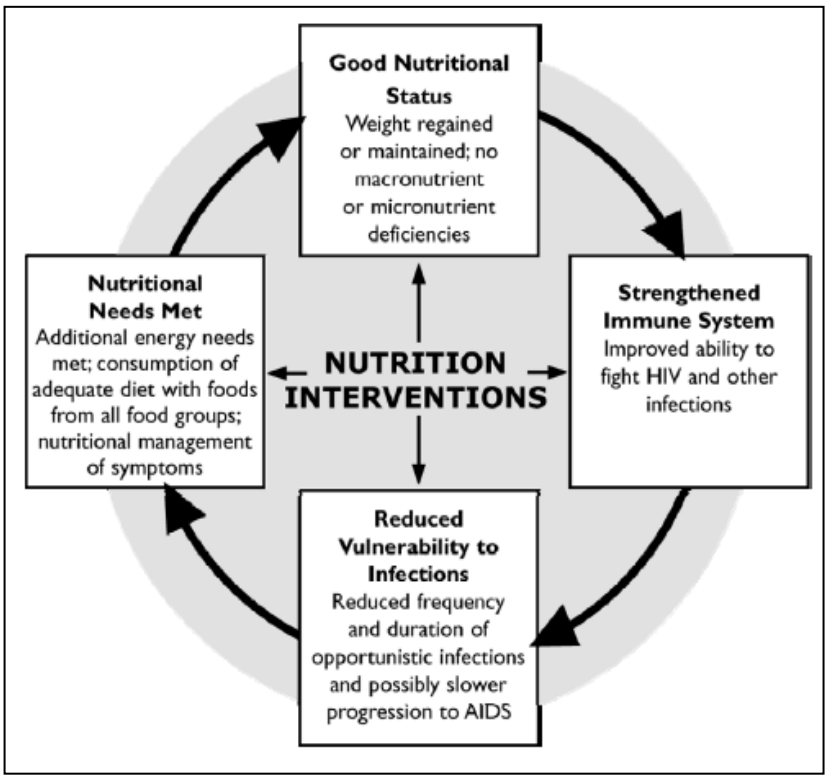


Figure 2. Relationship between nutrition interventions and HIV (Adopted from RCQHC and FANTA 2003)

2.3 Impact of HIV/AIDS on food security

Food insecurity, which affects more than a billion people worldwide, is inextricably linked to the HIV epidemic[9]. Food insecurity and HIV/AIDS are intertwined in a vicious cycle that heightens vulnerability to, and worsens the severity of, each condition[10]. Food security is critical to successful prevention programmes. Food insecurity and HIV have been described as "syndemic", meaning epidemics that coexist and perpetuate each other[11]. Food insecurity can be both a consequence and a driver of HIV/AIDS. Disentangling the relationship between HIV/AIDS and food insecurity is complex, as the relationship is multifaceted and bidirectional. HIV/AIDS worsens family food insecurity because of the debilitation of the most productive household members, decreased individual and household economic capacity, and increased

[9] Weiser et al. (2011). Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. The American Journal of Clinical Nutrition, 94(6), 1729S-1739S

[10] Anema, A., Vogenthaler, N., Frongillo, E. A., Kadiyala, S., & Weiser, S. D. (2009). Food insecurity and HIV/AIDS: current knowledge, gaps, and research priorities. Current HIV/AIDS reports, 6(4), 224–231.

[11] Reddi A, Powers MA. Thyssen A HIV/AIDS and food insecurity: deadly syndemic or an opportunity for healthcare synergism in resouce-limited settings of sub-Saharan Africa? AIDS. 2012;26:115–7.

caregiver burden[12]. Food insecurity, in turn, leads to both increased risk of HIV transmission and more rapid HIV disease progression. In addition to making people more vulnerable to the consequences of HIV/AIDS, food insecurity is a driver of HIV/AIDS in its own right[13]. Food insecurity often leads to coping behaviours involving unprotected sex, as an individual's choices to remedy food insecurity become extremely limited. Thus, food insecurity heightens susceptibility to HIV infection. This means there is not always a direct causal relationship between food insecurity and transmission of HIV. Therefore, the overlap of food insecurity and HIV/AIDS is not arbitrary, as each condition has been found to adversely affect the other. Figure 3 illustrates the interrelations between food insecurity and HIV/AIDS.

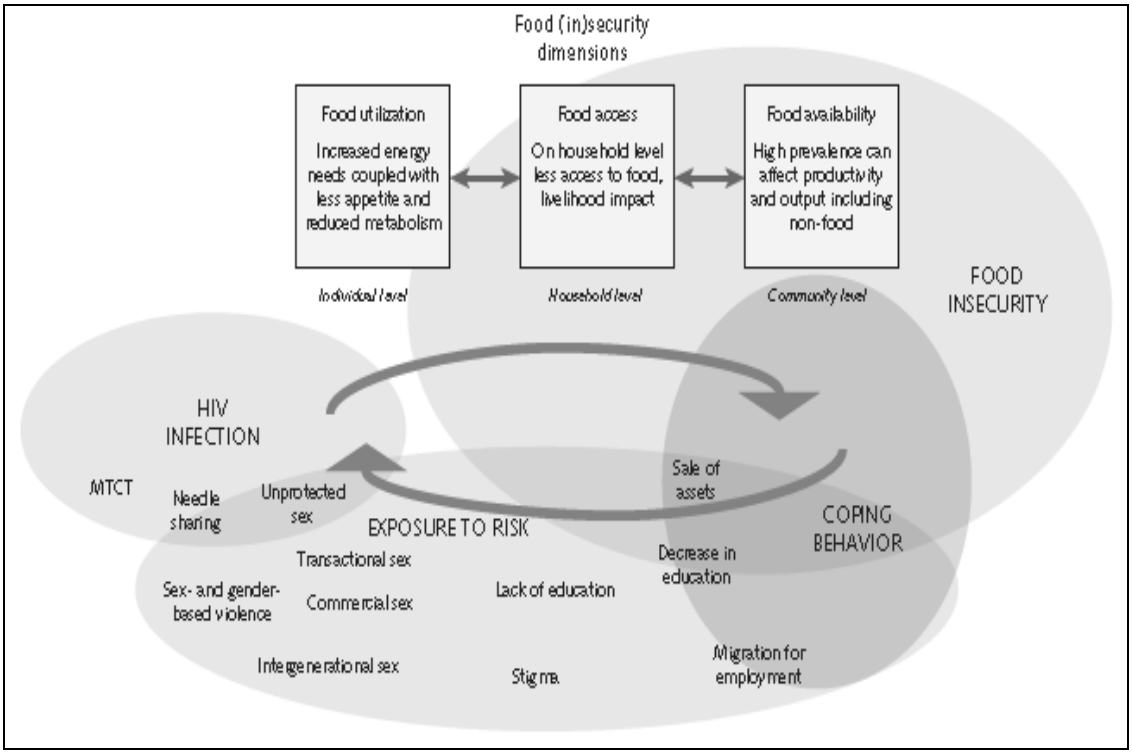


Figure 3. Framework adopted from Frega, et al. (2010) explaining the links between food insecurity and HIV/AIDS, MTCT, mother-to-child transmission

[12] The National Agricultural Advisory Services The impact of HIV/AIDS on the agricultural sector and rural livelihoods in Uganda. Rome, Italy: Integrated Support to Sustainable Development and Food Security Program, FAO, 2003

[13] Frega, et al. (2010). Food Insecurity in the Context of HIV/AIDS: A Framework for a New Era of Programming. Food and Nutrition Bulletin, 31(4_suppl4), S292–S312

2.4 Exploring the linkages: Food and nutrition security and HIV/AIDS

Food insecurity and HIV/AIDS are intertwined in a vicious cycle. Food insecurity typically operates at the level of the household and is influenced by other household-level factors such as family structure and social support. Food insecurity, in turn, shapes individual actions and health outcomes through nutritional, mental health, and behavioural pathways. Insufficient quality and quantity of food can lead to macronutrient and micronutrient deficiencies, which can affect both HIV acquisition and health outcomes among HIV-infected persons. The inability to procure food in socially or personally acceptable ways can, on one hand, lead to risky sex and enhanced HIV transmission, and, on the other hand, lead to ART non-adherence, treatment interruptions, and missed clinic visits, which can affect HIV health outcomes. HIV/AIDS–related morbidity and mortality is well established as a cause of adverse social and economic consequences for households, including increased food insecurity households affected by HIV/AIDS are particularly susceptible to food insecurity, they are often least able to rely on social support for assistance.

How food and nutritional insecurity can contribute to HIV

- Food and nutritional insecurity increase short-term mobility and migration – 'looking for food' places people in risky situations away from home.
- Food and nutritional insecurity exacerbate gender inequality – when there is limited food in the household, women often are the ones who suffer most, leading them to seek food elsewhere.
- In order to survive, hungry people may be forced into high risk situations, e.g. transactional or commercial sex.
- In food-insecure households, HIV/AIDS becomes a domestic hazard with intra-household clustering of infection and the possibility of parasitic infestation when collecting water.
- Generally, poor and food-insecure households are likely to face reduced access to, and ability to use, information around HIV prevention.
- Food insecurity increases risk of malnutrition, which may increase risk of infection.

Adopted from Gillespie (2006)

CHAPTER 3

Methodology

3.1. Introduction

The analysis will examine HIV/AIDS data that has been collected over the years thorough the vulnerability assessments and identify emerging trends regarding the interface of HIV/AIDS and food and nutrition insecurity.

3.2 Data generation process

The 2019 ZimVAC rural and urban assessments were informed by the multi-sectorial objectives generated by a multi-stakeholder consultation process. Appropriate survey designs and protocols informed by the survey objectives were developed. The assessments employed both a structured household questionnaire and a community focus group discussion questionnaire as the two primary data collection instruments.

3.3 Sample size determination and description

As already stated above, the 2019 assessment comprised the rural and the urban livelihoods assessment. The use of secondary data and relevant literature review were an integral part of the methodology for both the rural and livelihoods assessments including this consolidated report. In addition, the rural livelihoods assessment used a structured household questionnaire and a community focus group discussion questionnaire as the two primary data collection instruments.

3.4 Data analysis

Descriptive and inferential analysis were conducted on the consolidated 2019 ZimVAC data set. Propensity Score Matching (PSM) and Inverse Probability Weighting (IPW) were used to reduce or eliminate the confounding effects of observational survey data as observational or non-randomized studies suffer from selection bias unlike randomized control trials (RCTs) which use random treatment allocation.[14]

[14] Ibid

CHAPTER 4

HIV/AIDS Statistics at the Household Level

4.1 Introduction

This chapter presents statistics on HIV/AIDS prevalence in Zimbabwe at the household level. Furthermore, it presents household level factors associated with the probability of a household having a member infected by HIV/AIDS. It goes on to associate the household level factors with the ability of the household to cope with the HIV/AIDS burden as well as to adhere to the HIV/AIDS treatment protocol.

4.2 Proportion of households affected by HIV/AIDS

For the purposes of this report, a household is classified as "*affected by HIV/AIDS*" if it has at least one household member who is infected by HIV at the time of the survey.

4.2.1 Rural versus disaggregation of households affected by HIV

Table 1 shows the rural versus urban disaggregation of the proportion of households affected by HIV/AIDS. Nationally, 13.6% of the households surveyed had at least one HIV positive person. The disaggregation shows that 16.4% of rural households had at least one member who was infected by HIV compared to 9.7% of the urban households. The rural versus urban difference in the proportion of households with at least one member who was HIV positive at the time of the survey of 6.7% is statistically valid at the 1% level of significance. Considering only urban households, of those households that were affected by HIV/AIDS, the households had on average 1.439 members infected by HIV.

Table 1. Number of households affected by HIV/AIDS

Statistic	National		Rural [R]		Urban [U]		Difference
	Mean	S. D	Mean	S. D	Mean	S. D	[R – U]
Household is affected	0.136	0.343	0.164	0.370	0.097	0.296	0.067***
Number of members infected	1.439	0.620	.	.	1.439	0.620	

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

4.2.2 Rural provincial disaggregation of the households affected by HIV/AIDS

Table 2 shows the provincial disaggregation of the average number of rural households that had at least one member who was infected by HIV at the time of the survey. According to the table, Matabeleland North and Matabeleland South provinces had the highest prevalence of households affected by HIV/AIDS (23.7% and 22.4%, respectively). On the other hand, Manicaland and Mashonaland Central provinces had the lowest proportions of households affected by HIV/AIDS at 12.2%. A graphical representation of the rural provincial disaggregation of households affected by HIV/AIDS is displayed in Annex 1 of this report.

Table 2. Rural provincial disaggregation of proportion of households affected by HIV/AIDS

Province	Mean	S. D
Manicaland	0.122	0.328
Mash Central	0.122	0.327
Mash East	0.129	0.335
Mash West	0.143	0.350
Mat North	0.237	0.425
Mat South	0.224	0.417
Midlands	0.175	0.380
Masvingo	0.166	0.372

The decomposition of the provincial differences in the proportion of rural households shown in Table 3 details that whilst Matabeleland South and Matabeleland North provinces have statistically significant higher rates of households affected by HIV/AIDS than all the other provinces, there is however no statistically significant difference between the two provinces themselves. On the other hand, Manicaland province's lower proportion of households affected is only statistically valid in comparison to the provinces of Matabeleland North, Matabeleland South, Midlands and Masvingo. Moreover, the Mashonaland Central province lower proportion of households affected by HIV/AIDS is only statistically valid in comparison to Matabeleland North, Matabeleland South and Midlands provinces.

Table 3. Decomposition of rural provincial disaggregation of proportions of households affected by HIV/AIDS

Col Mean – Row mean	Manicaland	Mash Cen	Mash East	Mash Wes	Mat North	Mat South	Midlands
Mash Cen	0.006						
	(1.000)						
Mash East	0.010	0.004					
	(1.000)	(1.000)					
Mash Wes	0.021	0.015	0.011				
	(1.000)	(1.000)	(1.000)				
Mat North	0.128	0.122	0.118	0.107			
	(0.000)	(0.000)	(0.000)	(0.000)			
Mat South	0.102	0.096	0.092	0.081	-0.026		
	(0.000)	(0.000)	(0.000)	(0.000)	(1.000)		
Midlands	0.068	0.061	0.058	0.047	-0.061	-0.035	
	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)	(0.208)	
Masvingo	0.043	0.037	0.033	0.022	-0.085	-0.059	-0.025
	(0.061)	(0.179)	(0.322)	(1.000)	(0.000)	(0.000)	(1.000)

Notes: Level of statistical significance in parentheses.

4.2.3 Urban provincial disaggregation of the households affected by HIV/AIDS

Table 4 shows the urban provincial disaggregation of the proportion of households affected by HIV/AIDS. According to the table, Bulawayo and Midlands provinces at 13.6% and 11.3%, respectively, have the highest prevalence of urban households affected by HIV/AIDS in the country. On the other hand, Mashonaland East province at 6.2% and Mashonaland Central province at 7.8% have the lowest prevalence of households affected by HIV/AIDS. A graphical representation of the urban provincial disaggregation of the proportion of households affected by HIV/AIDS is displayed in Annex 2 of this report.

Table 4. Urban provincial disaggregation of proportion of households affected by HIV/AIDS

Province	Mean	S. D
Bulawayo	0.136	0.343
Manicaland	0.103	0.304
Mash Central	0.078	0.268
Mash East	0.062	0.242
Mash West	0.107	0.309
Mat North	0.105	0.307
Mat South	0.099	0.299
Midlands	0.113	0.317
Masvingo	0.079	0.270
Harare	0.094	0.292

The decomposition of urban households shown in Table 5 shows that the high prevalence of households affected by HIV/AIDS in Bulawayo of 13.6% is not statistically different from all the other provinces save for Mashonaland Central, Mashonaland East and Masvingo provinces.

Table 5. Decomposition of urban provincial disaggregation of proportions of households affected by HIV/AIDS

Col Mean – row Mean	Bulawayo	Manicaland	Mash Cen	Mash East	Mash Wes	Mat North	Mat South	Midlands	Masvingo
Manicaland	-0.034								
	(1.000)								
Mash Cen	-0.058	-0.025							
	(0.031)	(1.000)							
Mash East	-0.074	-0.040	-0.015						
	(0.000)	(0.111)	(1.000)						
Mash Wes	-0.029	0.004	0.029	0.044					
	(1.000)	(1.000)	(1.000)	(0.002)					
Mat North	-0.031	0.002	0.027	0.043	-0.002				
	(1.000)	(1.000)	(1.000)	(0.198)	(1.000)				
Mat South	-0.037	-0.003	0.022	0.037	-0.007	-0.006			
	(0.860)	(1.000)	(1.000)	(0.206)	(1.000)	(1.000)			
Midlands	-0.023	0.010	0.035	0.051	0.006	0.008	0.014		
	(1.000)	(1.000)	(0.625)	(0.000)	(1.000)	(1.000)	(1.000)		
Masvingo	-0.057	-0.023	0.002	0.017	-0.027	-0.026	-0.020	-0.034	
	(0.017)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(0.394)	
Harare	-0.042	-0.008	0.017	0.032	-0.012	-0.011	-0.005	-0.019	0.015
	(0.111)	(1.000)	(1.000)	(0.122)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)

Notes: Level of statistical significance in parentheses.

4.2.3 Urban provincial disaggregation of number of household members infected by HIV/AIDS

Table 6 shows the urban provincial disaggregation of the average number of household members infected by HIV. According to the table, Midlands and Matabeleland South provinces at 1.488 and 1.466 members have the highest number of household members infected by HIV in the 2019 survey. On the other hand, the provinces of Bulawayo and Matabeleland North have the lowest average number of household members infected by HIV. A graphical representation of the average number of household members infected by HIV is shown in Annex 3.

Table 6. Urban provincial disaggregation of number of household members infected by HIV/AIDS

Province	Mean	S. D
Bulawayo	1.350	0.658
Manicaland	1.412	0.623
Mash Central	1.435	0.544
Mash East	1.453	0.643
Mash West	1.458	0.621
Mat North	1.373	0.554
Mat South	1.466	0.586
Midlands	1.488	0.612
Masvingo	1.415	0.727
Harare	1.439	0.617

The decomposition of the average number of household members infected by HIV (Table 7) shows that the provincial differences in the number of household members infected by HIV are marginal and are statistically invalid before controlling for observed confounders.

Table 7. Decomposition of the average number of household members infected by HIV/AIDS

Row Mean - Col Mean	Bulawayo	Manicaland	Mash Cen	Mash East	Mash Wes	Mat North	Mat South	Midlands	Masvingo
Manicaland	0.062								
	(1.000)								
Mash Cen	0.085	0.023							
	(1.000)	(1.000)							
Mash East	0.103	0.042	0.019						
	(1.000)	(1.000)	(1.000)						
Mash Wes	0.108	0.047	0.024	0.005					
	(1.000)	(1.000)	(1.000)	(1.000)					
Mat North	0.023	-0.039	-0.062	-0.080	-0.085				
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)				
Mat South	0.116	0.054	0.031	0.013	0.008	0.093			
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)			
Midlands	0.138	0.076	0.053	0.034	0.029	0.115	0.022		
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)		
Masvingo	0.065	0.004	-0.019	-0.038	-0.043	0.043	-0.051	-0.072	
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	
Harare	0.089	0.027	0.004	-0.015	-0.020	0.066	-0.027	-0.049	0.023
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)

Notes: Level of statistical significance in parentheses.

4.3 Household level characteristics and HIV/AIDS infection

4.2.4 Background by HIV/AIDS status

Table 8. Background characteristics by HIV/AIDS statusTable 8 shows the background characteristics of the surveyed households by the HIV/AIDS status of the household. The table shows that households affected by HIV are more likely to be female headed than male headed. Furthermore, heads of households that are affected by HIV/AIDS tend to be older and are less likely to be married or reside with their spouse than those that are not affected by HIV/AIDS.

Table 8 shows that before controlling for confounding variables, households that are affected by HIV/AIDS tend to be headed by heads that are less educated than those not affected by HIV/AIDS. Furthermore, households that are affected by HIV/AIDS tend to have less income than those that are not affected by HIV/AIDS. The religion dummies in Table 8 indicate that Pentecostal and Apostolic sect members are less likely to be affected by HIV/AIDS than those that attended other religious groups.

4.2.5 Correlates of household characteristics and HIV status

Table 9 shows that gender heterogeneity in the likelihood of the household being affected by HIV/AIDS is statistically insignificant after controlling for confounding variables. Marital status of the household head is however statistically valid even after controlling for confounders observed. The results in Column (I) indicate that being married and living together with the spouse reduces the probability of the household being affected by HIV/AIDS by 3.33% at the 1% level of significance. The findings on marital status are consistent with studies that note that, compared to those who were married, the risk of HIV infection is higher for those who were never married or widowed.[15] Furthermore, the results in Column (I) indicate that being married and living away from the spouse reduces the probability of the household being affected by HIV/AIDS by 3.46% at the 1% level of significance. On the other hand, being divorced or widow/widower is associated with an increase in the probability of the household having an HIV positive member of 6.01% and 6.48%

[15] Glynn, J. R., Carael, M., & Auvert, B. (2001). Why do young women have a much higher prevalence of HIV than young men? A study in Kisumu, Kenya and Ndola, Zambia. AIDS (London, England), 15, S51–S60. https://doi.org/10.1097/00002030-200108004-00006

respectively, after controlling for confounding variables. The results in Column (I) are robust to probit and logit specifications in Columns (II) and (III), respectively.

After controlling for observed covariates, Column (I) of Table 9 shows that those households without religion are associated with an increase in the probability of having a household member with HIV/AIDS in comparison to the Catholic households of 0.2% at the 5% level of significance. Furthermore, household income is associated with a decrease in the probability of the household being affected by HIV/AIDS whilst household size increases the probability of the household being affected by HIV/AIDS.

Table 8. Background characteristics by HIV/AIDS status

VARIABLES		National		Household has an HIV positive member?				Difference in means
				Yes [Y]		No [N]		
		Mean	S. D	Mean	S. D	Mean	S. D	[Y – N]
Household head is female		0.488	0.500	0.582	0.493	0.473	0.499	0.110***
Household head age		42.814	16.227	47.118	14.979	42.137	16.312	4.981***
	Married living together	0.665	0.472	0.544	0.498	0.684	0.465	-0.140***
	Married living apart	0.074	0.262	0.057	0.231	0.077	0.267	-0.020***
Household head marital status:	Divorced/separated	0.066	0.248	0.102	0.303	0.060	0.238	0.042***
	Widow/widower	0.139	0.346	0.249	0.433	0.121	0.326	0.128***
	Never married	0.048	0.214	0.041	0.199	0.049	0.217	-0.008**
Education level	None	0.099	0.298	0.122	0.327	0.095	0.293	0.027***
	Primary level	0.285	0.451	0.381	0.486	0.269	0.444	0.112***
	ZJC level	0.128	0.334	0.168	0.374	0.121	0.327	0.047***
	O' level	0.399	0.490	0.292	0.455	0.415	0.493	-0.124***
	A' level	0.029	0.166	0.010	0.101	0.031	0.174	-0.021***
	Diploma/Certificate after primary	0.006	0.076	0.003	0.055	0.006	0.079	-0.003***
	Diploma/Certificate after secondary	0.032	0.176	0.013	0.113	0.035	0.184	-0.022***
	Graduate/Post-Graduate	0.022	0.146	0.009	0.092	0.024	0.153	-0.015***
Religion:	Roman Catholic	0.093	0.290	0.095	0.293	0.093	0.290	0.002
	Protestant	0.095	0.293	0.092	0.288	0.095	0.294	-0.004
	Pentecostal	0.202	0.401	0.187	0.390	0.204	0.403	-0.016**
	Apostolic Sect	0.274	0.446	0.258	0.437	0.276	0.447	-0.019**
	Zion	0.077	0.267	0.096	0.295	0.074	0.263	0.022***
	Other Christian	0.075	0.263	0.077	0.267	0.074	0.263	0.003
	Islam	0.008	0.089	0.007	0.084	0.008	0.089	-0.001

	Traditional	0.020	0.139	0.025	0.156	0.019	0.136	0.006*
	Other religion	0.017	0.128	0.018	0.133	0.017	0.128	0.001
	No religion	0.116	0.321	0.126	0.332	0.115	0.319	0.011
	N/a	0.024	0.152	0.020	0.139	0.024	0.154	-0.005
Household size		4.727	2.088	5.125	2.339	4.665	2.039	0.461
Household income		610.307	1369.381	371.779	880.981	647.822	1427.500	-276.043***
Household has mentally ill member		0.122	0.402	0.175	0.494	0.114	0.385	0.061***
Household members with alive mother		2.142	1.529	2.322	1.670	2.114	1.503	0.208***
Household members with alive father		1.944	1.478	1.905	1.566	1.950	1.464	-0.045
Household is located in rural area		0.553	0.497	0.679	0.467	0.533	0.499	0.146***
Province:	Bulawayo	0.026	0.158	0.025	0.157	0.026	0.159	-0.001
	Manicaland	0.099	0.298	0.083	0.276	0.101	0.302	-0.018***
	Mash Central	0.101	0.301	0.085	0.279	0.103	0.305	-0.018***
	Mash East	0.134	0.340	0.105	0.307	0.138	0.345	-0.033***
	Mash West	0.132	0.339	0.120	0.324	0.134	0.341	-0.015**
	Mat North	0.084	0.278	0.128	0.334	0.077	0.267	0.051***
	Mat South	0.111	0.314	0.150	0.357	0.105	0.307	0.045***
	Midlands	0.131	0.337	0.149	0.356	0.128	0.334	0.021***
	Masvingo	0.096	0.294	0.094	0.292	0.096	0.295	-0.002
	Harare	0.087	0.282	0.061	0.239	0.091	0.287	-0.030***

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

Table 9. Correlates of household background and HIV/AIDS status

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household head is female	0.00523	0.0230	0.0528
	(0.00603)	(0.0339)	(0.0638)
Household head age	0.000334*	0.00234**	0.00314*
	(0.000200)	(0.000938)	(0.00170)
Married living together	-0.0333***	-0.197***	-0.346***
	(0.0125)	(0.0655)	(0.123)
Married living apart	-0.0346**	-0.210***	-0.385**
	(0.0145)	(0.0784)	(0.150)
Divorced/separated	0.0601***	0.227***	0.417***
	(0.0164)	(0.0748)	(0.138)
Widow/widower	0.0648***	0.194***	0.360***
	(0.0161)	(0.0737)	(0.138)
Primary level	0.0458***	0.194***	0.344***
	(0.0104)	(0.0428)	(0.0772)
ZJC level	0.0679***	0.300***	0.540***
	(0.0123)	(0.0508)	(0.0919)
O' level	0.0187*	0.0650	0.0925
	(0.0110)	(0.0496)	(0.0929)
A' level	-0.00627	-0.177*	-0.417**
	(0.0142)	(0.0997)	(0.206)
Diploma/Certificate after primary	-0.0240	-0.213	-0.471
	(0.0248)	(0.188)	(0.386)
Diploma/Certificate after secondary	-0.0145	-0.220**	-0.470**
	(0.0139)	(0.0935)	(0.193)
Graduate/Post-Graduate	-0.00645	-0.174	-0.381*
	(0.0153)	(0.109)	(0.227)
Protestant	0.00562	0.0187	0.0551
	(0.0111)	(0.0557)	(0.104)
Pentecostal	0.0162*	0.0688	0.149
	(0.00971)	(0.0489)	(0.0914)
Apostolic Sect	-0.00232	-0.0201	-0.0247
	(0.00945)	(0.0470)	(0.0879)
Zion	0.0136	0.0495	0.105
	(0.0125)	(0.0576)	(0.106)
Other Christian	0.00276	0.000657	0.0205
	(0.0119)	(0.0588)	(0.109)
Islam	0.00562	-0.00138	0.0240
	(0.0267)	(0.142)	(0.271)
Traditional	0.0310	0.148	0.260
	(0.0212)	(0.0908)	(0.166)
Other religion	0.0116	0.0644	0.123
	(0.0208)	(0.0989)	(0.184)
No religion	0.0248**	0.119**	0.226**
	(0.0112)	(0.0539)	(0.100)
N/a	0.00721	0.0135	0.0417

	(0.0165)	(0.0901)	(0.171)
Household size	0.0205***	0.0883***	0.161***
	(0.00237)	(0.00984)	(0.0177)
ln (Household income)	-0.0122***	-0.0602***	-0.109***
	(0.00216)	(0.0106)	(0.0196)
Household has mentally ill member	0.0129	0.0426	0.0751
	(0.00785)	(0.0303)	(0.0534)
Household members with alive mother	0.0148***	0.0361**	0.0548*
	(0.00491)	(0.0176)	(0.0309)
Household members with alive father	-0.0317***	-0.108***	-0.186***
	(0.00455)	(0.0158)	(0.0275)
Household is located in rural area	0.0168**	0.0850**	0.161**
	(0.00740)	(0.0371)	(0.0704)
Bulawayo	0.0303*	0.188**	0.334**
	(0.0158)	(0.0814)	(0.154)
Manicaland	-0.0132	-0.0457	-0.0913
	(0.0102)	(0.0599)	(0.116)
Mash Central	-0.0118	-0.0455	-0.0775
	(0.0106)	(0.0613)	(0.118)
Mash East	-0.0142	-0.0639	-0.118
	(0.00926)	(0.0562)	(0.108)
Mash West	0.00424	0.0343	0.0653
	(0.00917)	(0.0536)	(0.103)
Mat North	0.0428***	0.189***	0.348***
	(0.0118)	(0.0581)	(0.109)
Mat South	0.0349***	0.168***	0.306***
	(0.0110)	(0.0577)	(0.109)
Midlands	0.0206**	0.116**	0.214**
	(0.00979)	(0.0543)	(0.104)
Masvingo	0.00442	0.0374	0.0710
	(0.0105)	(0.0588)	(0.112)
Constant	0.0722***	-1.379***	-2.346***
	(0.0246)	(0.124)	(0.234)
Observations	19,184	19,184	19,184
R-squared	0.055		

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

4.2.6 Correlates of household characteristics and the number of household members infected by HIV/AIDS (Urban only)

Table 10 shows that, based on the number of infected household members, being married and living together with a spouse is associated with an increase in the number of household members infected by HIV by 0.375 members at the 1% level of significance. Furthermore, Islam religion is associated with a decrease in the number of household members infected by HIV of 0.412 at the 1% level of significance.

Table 10. OLS estimates of correlates of household characteristics and the number of household members infected by HIV (Urban only)

Household head is female	-0.0462
	(0.0570)
Household head age	0.000569
	(0.00195)
Married living together	0.375***
	(0.0765)
Married living apart	-0.0809
	(0.0885)
Divorced/separated	-0.0197
	(0.0825)
Widow/widower	-0.0548
	(0.0859)
Primary level	0.194**
	(0.0766)
ZJC level	0.0672
	(0.0776)
O' level	0.105
	(0.0737)
A' level	0.00451
	(0.116)
Diploma/Certificate after primary	0.255
	(0.248)
Diploma/Certificate after secondary	-0.137
	(0.108)
Graduate/Post-Graduate	-0.0690
	(0.115)
Protestant	-0.0431
	(0.0760)
Pentecostal	-0.0106
	(0.0637)
Apostolic Sect	-0.0158
	(0.0689)
Zion	-0.0303
	(0.101)
Other Christian	-0.00289
	(0.0998)
Islam	-0.412***
	(0.141)
Traditional	-0.236
	(0.159)
Other religion	-0.0775
	(0.0932)
No religion	-0.0192
	(0.0866)
N/a	0.0607
	(0.117)
Household size	0.00754

	(0.0160)
ln (Household income)	0.0135
	(0.0189)
Household has mentally ill member	-
Household members with alive mother	0.0369
	(0.0283)
Household members with alive father	0.00638
	(0.0240)
Bulawayo	-0.0550
	(0.0891)
Manicaland	0.0450
	(0.0752)
Mash Central	0.0363
	(0.0779)
Mash East	0.0233
	(0.0844)
Mash West	0.0336
	(0.0631)
Mat North	-0.0310
	(0.0822)
Mat South	0.0107
	(0.0791)
Midlands	0.0498
	(0.0645)
Masvingo	0.0834
	(0.0991)
Constant	0.958***
	(0.161)
Observations	962
R-squared	0.175

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

4.4 Coping with HIV/AIDS in Zimbabwe

4.4.1. Descriptive analysis of coping with HIV/AIDS in Zimbabwe

Table 11 shows the rural versus urban differences in household abilities to cope with HIV/AIDS illness in the household. According to the table, rural households experience more likelihood of a new infection in the household in the 12 months leading to the survey. The respective proportions were 8.9% and 2.9% with the difference of 6.4% being statistically valid at the 1% level of significance. Notwithstanding the higher likelihood of a household member experiencing a new infection of HIV, rural households felt less impact of the disease and were better able

to cope with the disease than their urban counterparts. Moreover, the table shows that rural households that experienced an infection of a household member in the 12 months leading to the survey reported that they were likely to be better able to cope with a future infection in the household than their urban counterparts.

Table 11. Rural versus urban household abilities to cope with HIV/AIDS

Ability to cope with HIV/AIDS		National		Rural [R]		Urban [U]		Difference in means
		Mean	S. D	Mean	S. D	Mean	S. D	
In the past 12 months did your household experience any shock or stress related to HIV/AIDS illness		0.063	0.242	0.089	0.285	0.025	0.158	0.064***
What was the impact of HIV and AIDS illness on your household?	Minor/Mild	0.129	0.335	0.151	0.358	0.024	0.153	0.127***
	Moderate	0.325	0.468	0.342	0.475	0.243	0.430	0.099***
	Severe	0.542	0.498	0.504	0.500	0.723	0.448	-0.219***
	Don't know	0.004	0.064	0.003	0.054	0.010	0.101	-0.007
How well did your household cope with HIV and AIDS illness?	Unable to cope	0.321	0.467	0.287	0.453	0.481	0.501	-0.194***
	Able to cope with difficulty	0.527	0.499	0.540	0.499	0.467	0.500	0.073**
	Able to cope without difficulty	0.150	0.357	0.171	0.377	0.048	0.215	0.122***
	Not applicable	0.002	0.049	0.002	0.047	0.003	0.059	-0.001
To what extent were you and your household able to recover from HIV/AIDS illness	Did not recover	0.220	0.414	0.208	0.406	0.300	0.460	-0.092**
	Recovered some, but worse off than before	0.325	0.468	0.314	0.464	0.400	0.492	-0.086**
	Recovered to the same level as before	0.343	0.475	0.359	0.480	0.233	0.424	0.125***
	Recovered, and better off than before	0.113	0.317	0.120	0.325	0.067	0.250	0.053**
If you were to experience HIV/AIDS illness in the future, how do you think your household would cope?	Unable to cope	0.428	0.495	0.390	0.488	0.602	0.490	-0.212***
	Able to cope with difficulty	0.409	0.492	0.427	0.495	0.326	0.469	0.102***
	Able to cope without difficulty	0.159	0.366	0.180	0.385	0.063	0.242	0.118***
	Not applicable	0.004	0.064	0.003	0.054	0.010	0.099	-0.007

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

4.4.3 Household characteristics and HIV/AIDS impact severity

Table 12 shows that after controlling for observed household characteristics, being married and living together with the spouse increases the probability that the household perceives the impact of the infection of a household member by HIV to be severe on the household. The same trend is replicated when one looks at widow/widower headed households.

The results in Table 12 further indicate that *ceteris paribus*, living in the rural areas reduces the probability that the household perceives the impact of HIV infection of a household member to be severe. Indeed, Column (I) of the table shows that at the 1% level of significance, in comparison to their urban counterparts, households located in rural areas are 20.6% less likely to perceive the HIV infection of a household member to be severe all things being equal. This result is robust to the change in specification shown in Columns (II) and (III) of the table.

Table 12. Correlates of household characteristics and HIV/AIDS impact severity

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household head is female	0.0602	0.158	0.262
	(0.0486)	(0.134)	(0.221)
Household head age	-0.000286	-0.000770	-0.00129
	(0.00125)	(0.00334)	(0.00542)
Married living together	0.195**	0.546**	0.889**
	(0.0925)	(0.258)	(0.416)
Married living apart	0.151	0.429	0.706
	(0.116)	(0.311)	(0.505)
Divorced/separated	0.185*	0.517*	0.838**
	(0.0953)	(0.265)	(0.427)
Widow/widower	0.236***	0.661***	1.066***
	(0.0907)	(0.253)	(0.407)
Primary level	-0.0800*	-0.208*	-0.345*
	(0.0465)	(0.123)	(0.200)
ZJC level	-0.0624	-0.159	-0.263
	(0.0554)	(0.148)	(0.242)
O' level	-0.0559	-0.144	-0.245
	(0.0541)	(0.144)	(0.235)
A' level	-0.0904	-0.263	-0.471
	(0.162)	(0.484)	(0.775)
Diploma/Certificate after primary	-0.211	-0.585	-0.966
	(0.190)	(0.664)	(0.986)
Diploma/Certificate after secondary	-0.218	-0.593	-0.972
	(0.166)	(0.446)	(0.741)

Graduate/Post-Graduate	-0.131	-0.357	-0.609
	(0.151)	(0.410)	(0.693)
Protestant	-0.0426	-0.127	-0.191
	(0.0661)	(0.181)	(0.291)
Pentecostal	-0.0179	-0.0604	-0.0771
	(0.0577)	(0.159)	(0.259)
Apostolic Sect	-0.0109	-0.0408	-0.0480
	(0.0530)	(0.145)	(0.236)
Zion	-0.0603	-0.166	-0.259
	(0.0666)	(0.179)	(0.290)
Other Christian	-0.0101	-0.0282	-0.0268
	(0.0633)	(0.177)	(0.288)
Islam	-0.141	-0.392	-0.618
	(0.171)	(0.455)	(0.754)
Traditional	-0.148*	-0.412*	-0.643*
	(0.0847)	(0.243)	(0.383)
Other religion	-0.0909	-0.273	-0.416
	(0.112)	(0.307)	(0.499)
No religion	0.0272	0.0666	0.128
	(0.0642)	(0.175)	(0.283)
N/a	0.0290	0.0847	0.138
	(0.0990)	(0.279)	(0.456)
Household size	-0.000123	-0.00204	0.000734
	(0.0112)	(0.0297)	(0.0498)
ln (Household income)	0.000917	0.000372	0.00218
	(0.0128)	(0.0341)	(0.0557)
Household has mentally ill member	-0.00128	-0.00383	-0.00565
	(0.0297)	(0.0757)	(0.123)
Household members with alive mother	-0.00379	-0.00813	-0.0177
	(0.0183)	(0.0484)	(0.0801)
Household members with alive father	-0.00787	-0.0204	-0.0358
	(0.0160)	(0.0424)	(0.0690)
Household is located in rural area	-0.206***	-0.572***	-0.934***
	(0.0483)	(0.138)	(0.231)
Bulawayo	-0.538***	-1.534***	-2.551***
	(0.128)	(0.402)	(0.686)
Manicaland	0.0405	0.0791	0.0838
	(0.0686)	(0.239)	(0.421)
Mash Central	-0.0542	-0.206	-0.390
	(0.0761)	(0.242)	(0.422)
Mash East	-0.147**	-0.450**	-0.781*
	(0.0702)	(0.228)	(0.399)
Mash West	-0.176**	-0.526**	-0.904**
	(0.0691)	(0.226)	(0.396)
Mat North	-0.162**	-0.484**	-0.835**
	(0.0773)	(0.243)	(0.421)
Mat South	-0.123	-0.378	-0.669
	(0.0758)	(0.241)	(0.417)
Midlands	-0.112	-0.357	-0.632

	(0.0727)	(0.234)	(0.408)
Masvingo	-0.195***	-0.573**	-0.976**
	(0.0733)	(0.235)	(0.409)
Constant	0.712***	0.634	1.064
	(0.148)	(0.427)	(0.702)
Observations	1,165	1,165	1,165
R-squared	0.090		

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

4.4.4 Household characteristics and inability to cope with HIV/AIDS burden

Table 13 shows that, ceteris paribus, an increase in household income of 1% is associated with a decline in the probability that the household is not able to cope with the burden of HIV/AIDS by 2.33%. Furthermore, all things being equal, households located in rural areas have 16.9% more likelihood of being able to cope with the burden of HIV/AIDS than their urban counterparts at the 1% level of significance. Chapter 8 of this report will explain the rural versus urban differentials in the coping abilities in terms of heterogeneity in the impact of social protection.

Table 13. Correlates of household characteristics and inability to cope with HIV/AIDS burden

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household head is female	0.0381	0.109	0.191
	(0.0493)	(0.141)	(0.242)
Household head age	-0.000353	-0.00103	-0.00176
	(0.00122)	(0.00360)	(0.00611)
Married living together	0.0228	0.0635	0.100
	(0.0912)	(0.262)	(0.430)
Married living apart	-0.0490	-0.153	-0.297
	(0.105)	(0.329)	(0.556)
Divorced/separated	-0.0648	-0.181	-0.333
	(0.0931)	(0.270)	(0.445)
Widow/widower	0.0707	0.203	0.330
	(0.0895)	(0.259)	(0.424)
Primary level	-0.161***	-0.464***	-0.768***
	(0.0446)	(0.125)	(0.207)
ZJC level	-0.112**	-0.308**	-0.519**
	(0.0536)	(0.150)	(0.251)
O' level	-0.108**	-0.298**	-0.492**
	(0.0511)	(0.144)	(0.237)
A' level	-0.0900	-0.229	-0.369
	(0.160)	(0.463)	(0.722)
Diploma/Certificate after primary	0.00444	0.0294	0.0329
	(0.173)	(0.640)	(0.957)

Diploma/Certificate after secondary	-0.215*	-0.642	-0.999
	(0.128)	(0.403)	(0.641)
Graduate/Post-Graduate	-0.100	-0.270	-0.442
	(0.133)	(0.388)	(0.627)
Protestant	-0.00655	-0.0294	-0.0474
	(0.0640)	(0.193)	(0.321)
Pentecostal	0.0287	0.0999	0.146
	(0.0565)	(0.165)	(0.275)
Apostolic Sect	0.00862	0.0334	0.0357
	(0.0520)	(0.154)	(0.257)
Zion	0.0434	0.150	0.223
	(0.0647)	(0.190)	(0.319)
Other Christian	0.0442	0.126	0.218
	(0.0602)	(0.177)	(0.290)
Islam	-0.153	-0.483	-0.827
	(0.141)	(0.494)	(0.891)
Traditional	0.0239	0.0527	0.104
	(0.0833)	(0.260)	(0.429)
Other religion	-0.0192	-0.0944	-0.125
	(0.0909)	(0.287)	(0.457)
No religion	0.0702	0.214	0.352
	(0.0629)	(0.186)	(0.312)
N/a	0.149	0.421	0.706
	(0.106)	(0.290)	(0.483)
Household size	-0.00391	-0.00975	-0.0196
	(0.00988)	(0.0294)	(0.0491)
ln (Household income)	-0.0233**	-0.0725**	-0.118**
	(0.0117)	(0.0354)	(0.0593)
Household has mentally ill member	-0.0109	-0.0391	-0.0621
	(0.0274)	(0.0840)	(0.146)
Household members with alive mother	0.000405	-0.000154	0.00116
	(0.0175)	(0.0518)	(0.0880)
Household members with alive father	-0.0121	-0.0399	-0.0636
	(0.0154)	(0.0459)	(0.0777)
Household is located in rural area	-0.169***	-0.484***	-0.792***
	(0.0493)	(0.137)	(0.228)
Bulawayo	-0.468***	-1.390***	-2.307***
	(0.113)	(0.449)	(0.814)
Manicaland	-0.00702	0.00221	-0.00553
	(0.0788)	(0.210)	(0.340)
Mash Central	-0.204**	-0.531**	-0.857**
	(0.0818)	(0.223)	(0.366)
Mash East	-0.199**	-0.513**	-0.842**
	(0.0775)	(0.208)	(0.341)
Mash West	-0.194**	-0.499**	-0.816**
	(0.0758)	(0.203)	(0.333)
Mat North	-0.221***	-0.582**	-0.959**
	(0.0836)	(0.231)	(0.385)
Mat South	-0.280***	-0.796***	-1.301***

	(0.0802)	(0.229)	(0.383)
Midlands	-0.163**	-0.411*	-0.672*
	(0.0802)	(0.215)	(0.352)
Masvingo	-0.258***	-0.691***	-1.136***
	(0.0789)	(0.218)	(0.360)
Constant	0.861***	1.031**	1.718**
	(0.149)	(0.435)	(0.721)
Observations	1,152	1,152	1,152
R-squared	0.100		

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

4.4.5 Household characteristics and inability to recover from HIV burden

Table 14 shows that all things being equal, female-headed households are more likely to be unable to recover from the HIV/AIDS burden than their male counterparts at the 10% level of significance. Furthermore, in comparison to single household heads, household heads that are married or divorced are associated with higher probability of not being able to recover from the HIV/AIDS burden *ceteris paribus*. The results in Table 14 further indicate that households located in the rural areas are associated with a decline in the inability to recover from the HIV/AIDS burden of 12.5% at the 5% level of significance holding all things constant.

Table 14. Correlates of household characteristics and inability to recover from HIV/AIDS burden

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household head is female	0.102*	0.449**	0.817**
	(0.0555)	(0.203)	(0.357)
Household head age	-0.000802	-0.00246	-0.00320
	(0.00130)	(0.00501)	(0.00877)
Married living together	0.268***	4.883***	14.71***
	(0.0619)	(0.240)	(0.437)
Married living apart	0.111*	4.025***	12.96***
	(0.0661)	(0.415)	(0.883)
Divorced/separated	0.273***	4.835***	14.60***
	(0.0623)	(0.220)	(0.417)
Widow/widower	0.225***	4.710***	14.32***
	(0.0571)	(0.213)	(0.418)
Primary level	0.127***	0.552***	0.955***
	(0.0410)	(0.181)	(0.316)
ZJC level	0.0418	0.236	0.375
	(0.0478)	(0.216)	(0.382)
O' level	0.0944*	0.465**	0.788**
	(0.0499)	(0.214)	(0.377)
A' level	-0.114		

	(0.104)		
Diploma/Certificate after primary	-0.0241		
	(0.0865)		
Diploma/Certificate after secondary	0.0980	0.553	0.982
	(0.145)	(0.617)	(1.182)
Graduate/Post-Graduate	0.0296	0.101	0.304
	(0.121)	(0.602)	(1.104)
Protestant	-0.0930	-0.363	-0.538
	(0.0728)	(0.266)	(0.487)
Pentecostal	-0.0567	-0.230	-0.370
	(0.0664)	(0.232)	(0.414)
Apostolic Sect	-0.00528	-0.0609	-0.0469
	(0.0604)	(0.206)	(0.370)
Zion	-0.0370	-0.164	-0.228
	(0.0690)	(0.256)	(0.457)
Other Christian	-0.107	-0.435	-0.751
	(0.0713)	(0.271)	(0.488)
Islam	-0.0774	-0.617	-0.961
	(0.0852)	(0.465)	(0.793)
Traditional	0.138	0.482	0.903
	(0.108)	(0.345)	(0.603)
Other religion	-0.235***		
	(0.0705)		
No religion	-0.0275	-0.124	-0.142
	(0.0701)	(0.254)	(0.452)
N/a	0.0626	0.184	0.407
	(0.114)	(0.379)	(0.647)
Household size	0.0200*	0.0734*	0.130*
	(0.0115)	(0.0382)	(0.0678)
ln (Household income)	-0.0193	-0.0618	-0.123
	(0.0133)	(0.0480)	(0.0858)
Household has mentally ill member	0.0201	0.0874	0.123
	(0.0290)	(0.102)	(0.181)
Household members with alive mother	0.0121	0.0411	0.0800
	(0.0190)	(0.0646)	(0.114)
Household members with alive father	-0.0298*	-0.108*	-0.185*
	(0.0164)	(0.0570)	(0.0977)
Household is located in rural area	-0.125**	-0.477**	-0.803**
	(0.0635)	(0.209)	(0.373)
Bulawayo	-0.192	-0.870	-1.499
	(0.133)	(0.625)	(1.193)
Manicaland	0.136	0.495	0.849
	(0.118)	(0.330)	(0.553)
Mash Central	-0.118	-0.256	-0.423
	(0.114)	(0.338)	(0.567)
Mash East	-0.178*	-0.505	-0.875
	(0.108)	(0.320)	(0.539)
Mash West	-0.184*	-0.558*	-0.950*
	(0.108)	(0.320)	(0.549)
Mat North	-0.203*	-0.617*	-1.118*
	(0.112)	(0.354)	(0.615)
Mat South	-0.0203	0.102	0.169

	(0.115)	(0.335)	(0.563)
Midlands	-0.0205	0.0192	0.0168
	(0.115)	(0.325)	(0.543)
Masvingo	-0.256**	-0.961***	-1.690***
	(0.109)	(0.346)	(0.618)
Constant	0.147	-5.266***	-15.38***
	(0.165)	(0.555)	(1.030)
Observations	798	779	779
R-squared	0.146		

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

4.5 Adherence to HIV treatment protocol

According to Table 15 which shows the proportion of urban households that have a member who missed HIV medicines in the 30 days prior to the survey, Masvingo and Manicaland provinces have the highest proportions of households with members who missed their HIV medicines of 10.6% and 8.7% respectively. On the other hand, Bulawayo and Matabeleland North provinces had the lowest proportions of households with members who missed their medicines in the 30 days prior to the survey. A graphical representation of the figures in Table 15 is presented in Annex 4.

Table 15. Proportion of households that missed HIV medicine

Province	Mean	S. D
Bulawayo	0.012	0.109
Manicaland	0.087	0.283
Mash Central	0.064	0.247
Mash East	0.048	0.214
Mash West	0.085	0.280
Mat North	0.032	0.178
Mat South	0.042	0.202
Midlands	0.077	0.268
Masvingo	0.106	0.310
Harare	0.073	0.261
Total	0.067	0.250

The decomposition of the provincial differences in the proportion of households that missed their HIV medicine presented in Table 16 shows that the provincial differences are not statistically valid.

Table 16. Decomposition of provincial differences in the proportion of households that missed HIV medicines

Row Mean - Col Mean	Bulawayo	Manicaland	Mash Cen	Mash East	Mash Wes	Mat North	Mat South	Midlands	Masvingo
Manicaland	0.075								
	(1.000)								
Mash Cen	0.052	-0.023							
	(1.000)	(1.000)							
Mash East	0.036	-0.039	-0.016						
	(1.000)	(1.000)	(1.000)						
Mash Wes	0.073	-0.002	0.021	0.037					
	(1.000)	(1.000)	(1.000)	(1.000)					
Mat North	0.020	-0.055	-0.032	-0.015	-0.053				
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)				
Mat South	0.030	-0.045	-0.022	-0.006	-0.043	0.010			
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)			
Midlands	0.065	-0.010	0.014	0.030	-0.008	0.045	0.035		
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)		
Masvingo	0.094	0.019	0.042	0.058	0.021	0.074	0.064	0.029	
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	
Harare	0.061	-0.014	0.009	0.026	-0.012	0.041	0.031	-0.004	-0.033
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)

Notes: Level of statistical significance in parentheses.

4.6 Chapter Summary

4.6.1 Rural versus urban disaggregation of households affected by HIV/AIDS

- Nationally, 13.6% of the households surveyed had at least one person in the household who was HIV positive.
- The rural versus urban disaggregation shows that 16.4% of rural households had at least one member who was infected by HIV compared to 9.7% of the urban households.
- For urban households only, of those households that were affected by HIV/AIDS, the households had on average 1.439 members infected by HIV.
- Matabeleland North (23.7%), Matabeleland South (22.5%), Midlands (17.5%), Masvingo (16.6%) are the top four rural provinces with households affected by HIV/AIDS.
- Bulawayo (13.6%) and Midlands provinces (11.3%) had the highest prevalence of HIV/AIDS affected households for the urban provinces.
- Mashonaland East (6.2%) and Mashonaland Central (7.8%) had the lowest HIV/AIDS affected households for the urban provinces.
- Midlands province (1.488) had the highest number of household members infected by HIV/AIDS in 2019.
- Bulawayo (1.350) had the lowest average number of household members infected by HIV/.

4.6.2 Household level characteristics and HIV/AIDS infection

- Households that are affected by HIV/AIDS tend to have less income.
- Female headed households are most likely to be affected by HIV/AIDS than male headed households.
- Heads of households that are affected by HIV/AIDS tend to be older and are less likely to be married or reside with their spouse.
- Households that are affected by HIV/AIDS tend to be headed by household heads that are less educated.
- Households without a religion are associated with an increase in the probability of having a household member with HIV/AIDS.
- An increase in household income is associated with a decrease in the probability of the household being affected by HIV/AIDS.

- An increase in household size increases the probability of the household being affected by HIV/AIDS.
- Religion dummies indicate that Pentecostal and Apostolic sect members are less likely to be affected by HIV/AIDS.

4.6.3 Household characteristics and the number of household members infected by HIV/AIDS (Urban only)

- Being married and living with spouse is associated with an increase in the number of urban household members infected by HIV.
- Islam religion is associated with a decrease in the number of urban household members infected by HIV.

4.6.4 Coping with HIV/AIDS in Zimbabwe

- Rural households experience increased likelihood of a new infection in the household.
- However, HIV/AIDS affected rural households feel less impact of the disease and are better able to cope with the disease than their urban counterparts.
- HIV/AIDS affected rural households have an increased likelihood of being able to cope with a future infection in the household than their urban counterparts.

4.6.5 Household characteristics and HIV/AIDS impact severity

- Being married and living together with the spouse increases the probability that the household perceives the impact of the infection of a household member by HIV to be severe on the household.
- Living in the rural areas reduces the probability that the household perceives the impact of HIV infection of a household member to be severe.
- HIV/AIDS affected households located in rural areas are 20.6% less likely to perceive the HIV infection of a household member to be severe.

4.6.6 Household characteristics and inability to cope with HIV/AIDS burden

- An increase in household income of an HIV/AIDS affected household by 1% is associated with a decline in the probability that the household is not able to cope with the burden of HIV/AIDS.

- Households located in rural areas have 16.9% more likelihood of being able to cope with the burden of HIV/AIDS than their urban counterparts.

4.6.7 Household characteristics and inability to recover from HIV/AIDS burden

- Female headed households are more likely to be unable to recover from the HIV/AIDS burden than their male counterparts
- Single household heads, married or divorced household heads are associated with higher probability of not being able to recover from the HIV/AIDS burden
- Households located in the rural areas are associated with a decline in the inability to recover from the HIV/AIDS burden than their urban counterparts.

4.6.8 Adherence to HIV/AIDS treatment protocol

- Masvingo and Manicaland provinces have the highest proportions of households with members who missed their HIV/AIDS medicines of 10.6% and 8.7%.
- Bulawayo and Matabeleland North provinces had the lowest proportions of households with members who missed their medicines.

4.7 Recommendations for further research

(i) There is need to get in-depth insights by answering the WHY questions as to the observed trends and patterns, for example:

(ii) Why are rural households affected by HIV/AIDS better able to carry (less impact) and cope with the burden of HIV/AIDS but have a reduced probability to recover as compared to their urban counterparts?

(iii) Why do HIV/AIDS affected households in Masvingo and Manicaland provinces have a reduced probability of adhering to their treatment protocols as compared to those in Bulawayo and Matabeleland North provinces?

(iv) It is strongly recommended that some case studies be conducted in a few clinics, affected households and HIV/AIDS known hotspots to answer the WHY questions emanating from the results of this secondary data analysis.

(v) Such case studies will give in-depth insights and in-depth understanding into the possible factors influencing impact, coping and recovering ability by the HIV/AIDS affected households.

(vi) More so, there is need for further research on access to health facilities and availability of drugs in the health facilities.

(vii) Such information is key to develop appropriate intervention strategies and development of effective policy.

CHAPTER 5

Nutritional Outcomes and HIV/AIDS

5.1 Introduction

There exists a complex interaction between HIV infection and immune function, with a dominant effect of HIV infection on nutritional status. Insufficient quality and quantity of food can lead to macronutrient and micronutrient deficiencies, which can affect both HIV acquisition and health outcomes among HIV-infected persons[16]. Undernutrition and HIV status have negative feedback loops, resulting in severe effects on the resilience of individuals, households, and communities[17]. At the individual level, a lack of access to appropriate food can translate into compromised immunity, nutrient deficiencies, and increased vulnerability to infectious diseases[17]. Reduced food intake in the HIV-affected household can also result from loss of income and food-production capacity in the family due to labour loss, psychosocial factors, or adverse effects of medication[18].

5.2 Household consumption patterns

Household food consumption is affected by a whole range of factors including food availability, food accessibility and food choice, which in turn may be influenced by geography, demography, disposable income, urbanization, marketing, culture and attitudes. ZimVAC analysis used five measures as proxy indicators to assess household food consumption at the time of the assessment, which are number of meals taken in a day, Food Consumption Score (FCS), Coping Strategy Index (CSI); Household Dietary Diversity Score (HDDS) and Household Hunger Scale (HHS).

[16] Anema et al. (2014). Food Security in the Context of HIV: Towards Harmonized Definitions and Indicators. AIDS and Behaviour, 18(5), 476-489.
[17] Weiser et al. (2011). Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. Am J Clin Nutr, 94(6).
[18] Anema et al (2009). Food insecurity and HIV/AIDS: current knowledge, gaps, and research priorities. Current HIV/AIDS reports, 6(4), 224-231

5.2.1 Adult number of meals

5.2.1.1 Descriptive analysis of adult number of meals

Table 17 displays the disaggregation of the mean number of adult meals consumed by household HIV/AIDS status. The results show that at the 1% level of significance HIV/AIDS affected households consume less number of adult meals (2.224) than their unaffected counterparts (2.325). The same trend is replicated when one looks at the subsample that cites the meals consumed the previous day as the usual number of adult meals that the household consumes.

Table 17. Adult number of meals by HIV/AIDS status of the household

		National	Household is affected by HIV		Difference
			Yes [Y]	No [N]	[Y – N]
Adult number of meals	Mean	2.311	2.224	2.325	-0.101***
	S. D	0.659	0.631	0.662	
	Min	0	0	0	
	Max	10	7	10	
Adult number of meals was usual number of meals	Mean	2.436	2.339	2.451	-0.112***
	S. D	0.619	0.615	0.618	
	Min	0	0	0	
	Max	8	7	8	

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

5.2.1.2 Inferential analysis of adult number of meals

The results presented in Table 18 show the OLS estimates of the association between HIV/AIDS household status and adult number of meals consumed by the household. Column (I) of the table shows that after controlling for observed confounding variables, households with PLWHIV consume 0.0359 less number of adult meals at the 1% level of significance. In addition, the results reveal that increasing the age of the household head by one year is associated with a decline in the household number of adult meals of 0.00126 at the 1% level of significance.

Column (I) shows that *ceteris paribus*, female-headed households are likely to have an increased number of adult meals by 0.0519 at the 1% level of significance. Moreover, the results indicate that an increase in the education of the household head increases the probability of the household consuming an increased number of

adult meals after controlling for confounding variables. Specifically, Column (I) shows that everything being constant, attainment of A' Level and Graduate/Post-Graduate by the household head increases the adult number of meals by 0.186 and 0.300, respectively.

Furthermore, Column (I) of Table 18 shows that households in rural areas consume 0.168 more adult meals than their urban counterparts holding everything else constant at the 1% level of significance. Increasing household income by 1% and having a father who is alive increases consumption of adult meals by 0.126 and 0.0255, respectively, whilst traditional religion is associated with reduced number of adult meals of 0.107 (Column I).

Table 18. Relationship of household HIV status and number of adult meals

VARIABLES	Adult meals	Adult meals was usual meals
	(I)	(II)
Household is affected	-0.0359***	-0.0378**
	(0.0134)	(0.0159)
Household head is female	0.0519***	0.0364**
	(0.0133)	(0.0148)
Household head age	-0.00126***	-0.000754*
	(0.000406)	(0.000449)
Married living together	0.0617**	0.0432
	(0.0281)	(0.0287)
Married living apart	0.0172	0.0194
	(0.0318)	(0.0325)
Divorced/separated	-0.0284	-0.0250
	(0.0318)	(0.0331)
Widow/widower	0.0185	-0.00216
	(0.0317)	(0.0333)
Primary level	0.00565	0.000988
	(0.0178)	(0.0197)
ZJC level	0.0120	0.00752
	(0.0210)	(0.0232)
O' level	0.0878***	0.0944***
	(0.0196)	(0.0218)
A' level	0.186***	0.219***
	(0.0340)	(0.0358)
Diploma/Certificate after primary	0.167**	0.286***
	(0.0666)	(0.0763)
Diploma/Certificate after secondary	0.296***	0.262***
	(0.0331)	(0.0378)
Graduate/Post-Graduate	0.300***	0.297***

	(0.0421)	(0.0417)
Protestant	0.0421**	0.0250
	(0.0214)	(0.0241)
Pentecostal	0.0194	0.0109
	(0.0194)	(0.0213)
Apostolic Sect	-0.0395**	-0.0364*
	(0.0183)	(0.0202)
Zion	-0.00924	-0.000474
	(0.0228)	(0.0261)
Other Christian	0.0111	0.0263
	(0.0236)	(0.0269)
Islam	-0.0869*	-0.0211
	(0.0508)	(0.0586)
Traditional	-0.107***	-0.170***
	(0.0329)	(0.0350)
Other religion	0.0480	0.0675
	(0.0403)	(0.0435)
No religion	-0.0363*	-0.0619***
	(0.0211)	(0.0233)
N/a	-0.0323	-0.0550
	(0.0326)	(0.0363)
Household size	-0.00472	-0.00879*
	(0.00403)	(0.00452)
ln (Household income)	0.126***	0.124***
	(0.00443)	(0.00489)
Household has mentally ill member	-0.0132	-0.0144
	(0.0118)	(0.0143)
Household members with alive mother	-0.0182**	-0.0234***
	(0.00726)	(0.00805)
Household members with alive father	0.0255***	0.0295***
	(0.00653)	(0.00727)
Household is located in rural area	0.168***	0.159***
	(0.0142)	(0.0160)
Bulawayo	0.0963***	-0.0399
	(0.0321)	(0.0347)
Manicaland	-0.00187	-0.0583**
	(0.0228)	(0.0259)
Mash Central	-0.0185	-0.0924***
	(0.0234)	(0.0269)
Mash East	0.0444**	-0.0493**
	(0.0223)	(0.0246)
Mash West	0.00606	-0.0759***
	(0.0211)	(0.0244)
Mat North	0.107***	0.116***
	(0.0240)	(0.0273)
Mat South	0.0643***	0.0213
	(0.0245)	(0.0269)
Midlands	0.0525**	-0.0261
	(0.0209)	(0.0236)

Masvingo	-0.00742	-0.121***
	(0.0229)	(0.0260)
Constant	1.475***	1.695***
	(0.0560)	(0.0550)
Observations	19,180	13,012
R-squared	0.103	0.127

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

5.2.2 Food Consumption Score (FCS)

The FCS is a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups. It is an important measure of food consumption. The FCS is calculated based on the past 7-day food consumption recall for the household and classified into three categories: poor consumption (FCS = 1.0 to 28); borderline (FCS = 28.1 to 42); and acceptable consumption (FCS = >42.0). The food consumption categories and their description are presented in Table 19.

Table 19. Food Consumption Score Thresholds

Food consumption category	FCS	Description
Poor	FCS<28	An expected consumption of staple 7 days, vegetables 5-6 days, sugar 3-4 days, oil/fat 1 day a week, while animal proteins are totally absent
Borderline	28 ≤FCS < 42	An expected consumption of staple 7 days, vegetables 6-7 days, sugar 3-4 days, oil/fat 3 days, meat/fish/egg/pulses 1-2 days a week, while dairy products are totally absent
Acceptable	FCS>42	As defined for the borderline group with more number of days a week eating meat, fish, egg, oil, and complemented by other foods such as pulses, fruits, milk

5.2.2.1 Descriptive analysis of Food Consumption Score

The results in Table 20 show the differences in the household food consumption score between the HIV/AIDS affected versus unaffected households. The descriptive results reveal that the proportion of HIV/AIDS affected households with an acceptable food consumption score is lower than that of unaffected households at the 1% level of significance. At least 54.3% of unaffected households had an acceptable food consumption score versus the 41.9% for the affected households. Concomitantly, a larger proportion of affected households had borderline (31%) and poor (27.1%) food consumption scores than their unaffected counterparts, 26.2% and 19.5% respectively.

Table 20. FCS by household HIV status

Household Food Consumption Score	National	HIV/AIDS status		Difference
		Yes [Y]	No [N]	[Y – N]
Acceptable	0.526	0.419	0.543	-0.124***
Borderline	0.269	0.310	0.262	0.048***
Poor	0.205	0.271	0.195	0.076***

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

5.2.2.2 Inferential analysis of having an acceptable FCS

Table 21 shows the determinants of households achieving acceptable food consumption score. Column (I) of the table results reveal that at the 1% level of statistical significance, HIV/AIDS affected households are 5.88% less likely to achieve an acceptable FCS than unaffected households after controlling for observed confounders. This result is robust to changes in model specification shown in Columns (II) and (III) of the table.

OLS estimates in Column (I) of the table show that all things being equal, households that are members of the Apostolic Sect, Zion and Traditional religion had a lower probability of achieving an acceptable FCS of 5.76%, 5.55% and 9.22% respectively, at the 1% level of significance. Furthermore, Column (I) shows that an increase in age and education level of the household head and income of the household increases the likelihood of households achieving an acceptable FCS. Specifically, an increase in the age of the household head by one year increases the probability of the household achieving an acceptable FCS by 0.118%. Moreover, attaining

Graduate/Post-Graduate level increases the probability of achieving an acceptable FCS by 20.6% at the 1% level of significance.

Results in Column (I) further indicate that ceteris paribus, with a 99% level of confidence, rural households had a 12.75% increased likelihood of achieving acceptable FCS *vis-à-vis* their urban counterparts.

Table 21. Relationship of household HIV/AIDS status and FCS

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is affected	-0.0588***	-0.166***	-0.278***
	(0.0101)	(0.0290)	(0.0477)
Household head is female	-0.00869	-0.0299	-0.0463
	(0.00917)	(0.0270)	(0.0445)
Household head age	0.00118***	0.00338***	0.00559***
	(0.000287)	(0.000822)	(0.00136)
Married living together	-0.0127	-0.0411	-0.0616
	(0.0175)	(0.0525)	(0.0870)
Married living apart	-0.0152	-0.0488	-0.0751
	(0.0206)	(0.0615)	(0.102)
Divorced/separated	-0.0526**	-0.149**	-0.239**
	(0.0209)	(0.0622)	(0.103)
Widow/widower	-0.0257	-0.0746	-0.119
	(0.0205)	(0.0607)	(0.100)
Primary level	0.0505***	0.146***	0.238***
	(0.0130)	(0.0373)	(0.0619)
ZJC level	0.0663***	0.190***	0.308***
	(0.0154)	(0.0437)	(0.0724)
O' level	0.127***	0.353***	0.574***
	(0.0142)	(0.0404)	(0.0670)
A' level	0.186***	0.542***	0.883***
	(0.0222)	(0.0692)	(0.116)
Diploma/Certificate after primary	0.230***	0.716***	1.195***
	(0.0362)	(0.140)	(0.244)
Diploma/Certificate after secondary	0.226***	0.721***	1.212***
	(0.0200)	(0.0708)	(0.124)
Graduate/Post-Graduate	0.206***	0.690***	1.159***
	(0.0219)	(0.0831)	(0.147)
Protestant	0.00472	0.0170	0.0277
	(0.0151)	(0.0455)	(0.0760)
Pentecostal	-0.0143	-0.0436	-0.0700
	(0.0131)	(0.0391)	(0.0648)
Apostolic Sect	-0.0576***	-0.164***	-0.269***
	(0.0128)	(0.0375)	(0.0620)
Zion	-0.0555***	-0.162***	-0.265***
	(0.0168)	(0.0485)	(0.0806)
Other Christian	-0.0251	-0.0713	-0.118

	(0.0160)	(0.0473)	(0.0781)
Islam	-0.0374	-0.110	-0.189
	(0.0370)	(0.109)	(0.176)
Traditional	-0.0922***	-0.272***	-0.447***
	(0.0257)	(0.0758)	(0.125)
Other religion	-0.0641**	-0.192**	-0.305**
	(0.0274)	(0.0798)	(0.131)
No religion	-0.0386**	-0.114***	-0.185**
	(0.0151)	(0.0437)	(0.0723)
N/a	-0.0610**	-0.175**	-0.288**
	(0.0243)	(0.0693)	(0.114)
Household size	-0.00658**	-0.0192**	-0.0314**
	(0.00291)	(0.00852)	(0.0141)
ln (Household income)	0.127***	0.373***	0.623***
	(0.00288)	(0.00985)	(0.0170)
Household has mentally ill member	-0.0227**	-0.0664**	-0.108**
	(0.00984)	(0.0281)	(0.0471)
Household members with alive mother	-0.0128**	-0.0347**	-0.0601**
	(0.00558)	(0.0161)	(0.0268)
Household members with alive father	0.00484	0.0117	0.0212
	(0.00513)	(0.0148)	(0.0247)
Household is located in rural area	0.127***	0.386***	0.652***
	(0.0101)	(0.0300)	(0.0496)
Bulawayo	0.0912***	0.260***	0.419***
	(0.0218)	(0.0653)	(0.109)
Manicaland	0.0244	0.0758*	0.112
	(0.0155)	(0.0446)	(0.0730)
Mash Central	0.0560***	0.172***	0.277***
	(0.0158)	(0.0458)	(0.0747)
Mash East	0.0617***	0.181***	0.295***
	(0.0146)	(0.0417)	(0.0683)
Mash West	0.0617***	0.183***	0.298***
	(0.0138)	(0.0398)	(0.0647)
Mat North	-0.0172	-0.0425	-0.0840
	(0.0161)	(0.0467)	(0.0767)
Mat South	0.00356	0.0112	0.00204
	(0.0156)	(0.0455)	(0.0749)
Midlands	0.112***	0.331***	0.539***
	(0.0142)	(0.0414)	(0.0677)
Masvingo	0.131***	0.379***	0.628***
	(0.0156)	(0.0457)	(0.0754)
Constant	-0.306***	-2.352***	-3.929***
	(0.0331)	(0.103)	(0.172)
Observations	19,184	19,184	19,184
R-squared	0.164		

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

5.2.3 Household Dietary Diversity Score (HDDS)

The household Dietary Diversity Score (HDDS) measures how many food groups (out of 12) are consumed by a household over a 24-hour period. It is used as a proxy for food access particularly in terms of consumption of a diversified, balanced and healthy diet.

5.2.3.1 Descriptive analysis of HDDS

Table 22 shows the descriptive analysis of the HDDS of the surveyed households. The table shows that at the 1% level of significance, households that are affected by HIV/AIDS had an average HDDS of 5.203 versus 5.549 points for the unaffected households. The finding therefore indicates that households that are affected by HIV/AIDS on average consume less food groups than households that are not affected by HIV/AIDS before controlling for observed confounders.

Table 22. Household Dietary Diversity and household HIV/AIDS status

	National		Yes [Y]		No [N]		Mean
	Mean	S. D	Mean	S. D	Mean	S. D	difference
HDDS in levels	5.502	1.614	5.203	1.636	5.549	1.606	-0.345***
Unacceptable HDDS	0.121	0.327	0.166	0.372	0.114	0.318	0.052***

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

5.2.3.2 Inferential analysis for background characteristics and HDDS

The results exhibited in Table 23 show that households with a member who is HIV positive are 13.2% less likely to achieve an acceptable HDDS (Column I) as compared to unaffected households at the 1% level of significance. Furthermore, results in Column I indicate that everything being constant, being a member of the Apostolic Sect and practicing Traditional religion decreases the likelihood of the household achieving an acceptable HDDS by 15.2% and 38% respectively. This result mirrors those for households living with a mentally ill member and those living with an alive mother as the probability of achieving an acceptable HDDS is reduced by 10.8% and 7.53% respectively at the 1% level of significance.

The results in Column (I) further reveal that a female household head and an increase in age and education of household head increase the probability of the

affected household achieving an acceptable HDDS. For example, at the 1% level of significance, increasing the age of household head by 1% increases the probability of the household achieving an acceptable HDDS by 0.48% and by 13.6% if the household head is female, *ceteris paribus*.

The provincial dummies indicate that in comparison to the base province of Bulawayo, save for Matabeleland North province, all the other provinces have an increased likelihood of achieving an acceptable HDDS.

Table 23. Relationship of household HIV/AIDS status and HDDS

VARIABLES	HDDS	Unacceptable HDDS
	(I)	(II)
Household is affected	-0.132***	0.0278***
	(0.0323)	(0.00767)
Household head is female	0.136***	-0.0139**
	(0.0286)	(0.00577)
Household head age	0.00480***	-0.000315
	(0.000901)	(0.000197)
Married living together	0.0509	0.00290
	(0.0521)	(0.0104)
Married living apart	0.0277	-0.00811
	(0.0613)	(0.0122)
Divorced/separated	-0.152**	0.0295**
	(0.0635)	(0.0137)
Widow/widower	-0.0300	0.00574
	(0.0625)	(0.0131)
Primary level	0.365***	-0.0650***
	(0.0415)	(0.0106)
ZJC level	0.486***	-0.0900***
	(0.0485)	(0.0118)
O' level	0.668***	-0.107***
	(0.0446)	(0.0109)
A' level	0.804***	-0.0976***
	(0.0724)	(0.0146)
Diploma/Certificate after primary	0.992***	-0.118***
	(0.123)	(0.0173)
Diploma/Certificate after secondary	1.038***	-0.109***
	(0.0646)	(0.0121)
Graduate/Post-Graduate	1.003***	-0.0950***
	(0.0726)	(0.0127)
Protestant	0.0808*	-0.0180*
	(0.0487)	(0.00931)
Pentecostal	-0.0212	-0.00377
	(0.0437)	(0.00853)
Apostolic Sect	-0.152***	0.0137
	(0.0433)	(0.00875)
Zion	-0.0930*	0.00167
	(0.0532)	(0.0111)
Other Christian	-0.0106	-0.00808
	(0.0529)	(0.0107)

Islam	-0.0973	-0.00902
	(0.107)	(0.0243)
Traditional	-0.380***	0.0766***
	(0.0841)	(0.0220)
Other religion	-0.0421	0.0364*
	(0.0931)	(0.0201)
No religion	-0.118**	0.0107
	(0.0491)	(0.0102)
N/a	-0.193**	0.00632
	(0.0806)	(0.0168)
Household size	0.000245	-0.00328
	(0.00921)	(0.00205)
ln (Household income)	0.446***	-0.0564***
	(0.00972)	(0.00214)
Household has mentally ill member	-0.108***	0.0218***
	(0.0322)	(0.00768)
Household members with alive mother	-0.0753***	0.0123***
	(0.0180)	(0.00426)
Household members with alive father	0.0396**	-0.00435
	(0.0167)	(0.00401)
Household is located in rural area	0.509***	-0.0628***
	(0.0323)	(0.00677)
Bulawayo	0.364***	-0.0433***
	(0.0733)	(0.0135)
Manicaland	0.289***	-0.0479***
	(0.0484)	(0.0104)
Mash Central	0.286***	-0.0603***
	(0.0495)	(0.0108)
Mash East	0.240***	-0.0429***
	(0.0497)	(0.0103)
Mash West	0.250***	-0.0471***
	(0.0444)	(0.00945)
Mat North	-0.322***	0.0279**
	(0.0516)	(0.0123)
Mat South	0.122**	-0.0694***
	(0.0493)	(0.00983)
Midlands	0.370***	-0.0606***
	(0.0450)	(0.00935)
Masvingo	0.458***	-0.0918***
	(0.0489)	(0.00991)
Constant	2.015***	0.584***
	(0.107)	(0.0237)
Observations	19,184	19,184
R-squared	0.208	0.090

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

5.2.4 Household Hunger Scale (HHS)

Household Hunger Scale (HHS) is another proxy of food access. The HHS is built around 3 questions about perceptions of a household on varying degrees of hunger

by the number of times a household has experienced hunger within the past 30 days prior to the survey. The Household hunger score ranges from 0 to 6.

5.2.4.1 Descriptive analysis of the household hunger scale

Table 24 shows that HIV/AIDS affected households are in more hunger than unaffected households in terms of all components of the household hunger score by a factor of 0.128 points, which is statistically valid at the 1% level of significance.

Table 24. Household hunger scale by household HIV/AIDS status

Household hunger scale	National	HIV/AIDS status		Difference
	[N]	Yes [Y]	No [N]	[Y-N]
Mean	0.272	0.383	0.255	0.128***
S. D	0.657	0.768	0.636	
Min	0	0	0	
Max	4	4	4	

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

5.2.4.2 Inferential analysis of the household hunger scale (HHS)

Table 25 shows the reduced form OLS and Lower Limit Tobit estimates of determinants of Household Hunger Scale (HHS) for the surveyed households. Column (I) shows that *ceteris paribus*, if the household has an HIV positive member, the HHS increases by 0.0865 points at the 1% level of statistical significance. The same trend is observed if the household head is divorced/separated (0.0920 points) and if there is an increase in household size (0.0226).

On the other hand, results in Column (I) reveal that an increase in age and education of household head, and household income reduces the HHS. In particular, increasing household income by 1% reduces the HHS of the HIV/AIDS affected household by 0.102 points at the 1% level of significance. More so, attainment of Graduate/Post-Graduate education level reduces the HHS of the HIV/AIDS affected household by 0.233 points, all things being constant.

The provincial dummies indicate that in comparison to the base province of Bulawayo, all the other provinces have a high probability for a reduced HHS.

Table 25. Relationship of household HIV/AIDS status and HHS

VARIABLES	OLS	Lower Limit Tobit
	(I)	(II)
Household is affected	0.0865***	0.218***
	(0.0158)	(0.0515)
Household head is female	-0.0228*	-0.143**
	(0.0124)	(0.0561)
Household head age	-0.00154***	-0.00205
	(0.000402)	(0.00152)
Married living together	0.00145	0.0191
	(0.0238)	(0.114)
Married living apart	0.0164	-0.103
	(0.0271)	(0.137)
Divorced/separated	0.0930***	0.206
	(0.0303)	(0.129)
Widow/widower	0.0269	0.0462
	(0.0286)	(0.128)
Primary level	-0.0799***	-0.361***
	(0.0205)	(0.0585)
ZJC level	-0.119***	-0.537***
	(0.0234)	(0.0732)
O' level	-0.187***	-0.724***
	(0.0217)	(0.0672)
A' level	-0.222***	-0.721***
	(0.0306)	(0.148)
Diploma/Certificate after primary	-0.129**	-1.323***
	(0.0562)	(0.403)
Diploma/Certificate after secondary	-0.216***	-1.205***
	(0.0263)	(0.193)
Graduate/Post-Graduate	-0.233***	-1.174***
	(0.0268)	(0.229)
Protestant	0.00102	-0.255***
	(0.0195)	(0.0975)
Pentecostal	0.0126	-0.101
	(0.0173)	(0.0814)
Apostolic Sect	0.0321*	0.0747
	(0.0169)	(0.0748)
Zion	-0.00319	-0.00933
	(0.0221)	(0.0952)
Other Christian	0.00206	-0.109
	(0.0217)	(0.0962)
Islam	0.0777	-0.139
	(0.0501)	(0.215)
Traditional	0.0683*	0.367***
	(0.0381)	(0.121)

Other religion	0.0139	0.273*
	(0.0347)	(0.148)
No religion	0.0727***	0.0478
	(0.0208)	(0.0844)
N/a	0.00837	0.0583
	(0.0340)	(0.138)
Household size	0.0226***	-0.0298*
	(0.00441)	(0.0174)
ln (Household income)	-0.102***	-0.493***
	(0.00425)	(0.0160)
Household has mentally ill member	0.0282**	0.123***
	(0.0140)	(0.0450)
Household members with alive mother	0.0157*	0.109***
	(0.00852)	(0.0301)
Household members with alive father	-0.0276***	-0.0374
	(0.00780)	(0.0265)
Household is located in rural area	-0.213***	-0.511***
	(0.0141)	(0.0609)
Bulawayo	-0.130***	-0.328**
	(0.0341)	(0.140)
Manicaland	-0.121***	-0.489***
	(0.0243)	(0.0875)
Mash Central	-0.162***	-0.617***
	(0.0235)	(0.0879)
Mash East	-0.232***	-0.389***
	(0.0214)	(0.0836)
Mash West	-0.161***	-0.473***
	(0.0219)	(0.0782)
Mat North	-0.228***	-0.00493
	(0.0239)	(0.0835)
Mat South	-0.0640***	-0.706***
	(0.0236)	(0.0990)
Midlands	-0.178***	-0.613***
	(0.0223)	(0.0810)
Masvingo	-0.173***	-0.878***
	(0.0235)	(0.0972)
Constant	1.145***	1.984***
	(0.0520)	(0.187)
Observations	19,184	19,184
R-squared	0.068	

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

5.3 Malnutrition and illness in children 6-59 months by Household HIV/AIDS status

Definition of terms

Measurements of weight, height and age of a child are converted to nutritional indices to indicate the nutrition status of a child. Any of the two measurements are combined to form indices as follows: Weight for height, Weight for age and Height for age. Weight for height as a measure of thinness or fatness is sensitive to sudden changes in energy balance. The nutrition indices can be classified as follows:

- Weight for height index of between two and three standard deviation below the mean is called Moderate Acute Malnutrition (MAM)/ Wasting.
- A child with weight for height of more than three standard deviation below the mean or/and has oedema is classified as Severe Acute Malnourished (SAM).

MAM or SAM is often due to acute starvation and/or severe disease.

Global Acute Malnutrition (GAM)
GAM is a sum of Moderate Acute Malnutrition and Severe Acute Malnutrition. The prevalence of Global Acute Malnutrition is usually below 5 percent in any developing country provided there is no food shortage.

Height for Age: is an index of growth and development. It is an expression of long-term exposure to nutritional inadequacy and indicates chronic malnutrition in children lacking essential nutrients but also related to poor sanitation, repeated infections, diarrhoea and inadequate care. Stunting is defined as Height for age index more than two standard deviation below the mean of the WHO reference population.

5.3.1 Descriptive analysis of malnutrition by household HIV/AIDS status

Table 26 shows that statistically, HIV/AIDS affected households had more (27.7%) stunted children than those in unaffected households (23.6%). The situation is similar for underweight children as HIV/AIDS affected households had more underweight children (9.9%) as compared to unaffected households (8.3%). The affected versus unaffected mean differences for both stunted and underweight children are statistically valid at the 1% level of significance.

Table 26. Stunting and underweight by household HIV/AIDS status

	National		Yes [Y]		No [N]		Mean
	Mean	S. D	Mean	S. D	Mean	S. D	difference
Stunted	0.242	0.428	0.277	0.448	0.236	0.425	0.041***
Underweight	0.085	0.279	0.099	0.299	0.083	0.276	0.016**

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

5.3.1.1 Inferential analysis of stunting and household HIV/AIDS status

Table 27 shows that *ceteris paribus*, households with an HIV positive member have an increased likelihood of having stunted children at the 1% level of statistical significance. Specifically, Column (I) of the table indicates that ceteris paribus, households that are affected by HIV/AIDS are 4.08% more likely to have under 5 children who are stunted at the 1% level of significance. The result in Column (I) is robust to changes in specification in Columns (II) and (III) of the table.

Column (I) to Column (III) reveal that increasing household income, age and education of household head and staying in the rural areas reduce the probability of having stunted children after controlling for observed confounding variables. In particular, Column (I) shows that increasing the age of the household head by one year reduces the likelihood of stunted children by 0.15% and attainment of Graduate/Post-Graduate qualification reduces the chances of stunted children by 7.68% with a 99% level of confidence. In addition, Column (I) shows that living in the rural areas reduces the probability of children being stunted by 4.54%. The provincial dummies indicate that in comparison to the base province of Bulawayo, all the other provinces have a high probability for reduced stunted children.

Table 27. Relationship of household HIV/AIDS status and stunting

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is affected	0.0408***	0.128***	0.218***
	(0.0127)	(0.0389)	(0.0654)
Household head is female	-0.0115	-0.0404	-0.0648
	(0.0112)	(0.0367)	(0.0626)
Household head age	-0.00150***	-0.00494***	-0.00843***
	(0.000367)	(0.00122)	(0.00210)
Married living together	-0.00738	-0.0215	-0.0396
	(0.0275)	(0.0898)	(0.153)
Married living apart	0.00477	0.0151	0.0267

	(0.0301)	(0.0987)	(0.169)
Divorced/separated	0.0184	0.0592	0.0984
	(0.0315)	(0.102)	(0.173)
Widow/widower	0.0240	0.0821	0.134
	(0.0310)	(0.101)	(0.173)
Primary level	0.0121	0.0387	0.0638
	(0.0169)	(0.0544)	(0.0930)
ZJC level	-0.00268	-0.00835	-0.0162
	(0.0196)	(0.0626)	(0.107)
O' level	-0.0132	-0.0424	-0.0719
	(0.0179)	(0.0575)	(0.0984)
A' level	-0.0829***	-0.284***	-0.501***
	(0.0260)	(0.0929)	(0.163)
Diploma/Certificate after primary	-0.0590	-0.222	-0.387
	(0.0529)	(0.211)	(0.378)
Diploma/Certificate after secondary	-0.0835***	-0.308***	-0.541***
	(0.0258)	(0.0980)	(0.175)
Graduate/Post-Graduate	-0.0768***	-0.276**	-0.487**
	(0.0297)	(0.113)	(0.202)
Protestant	0.00842	0.0292	0.0536
	(0.0190)	(0.0650)	(0.112)
Pentecostal	0.00544	0.0209	0.0376
	(0.0162)	(0.0557)	(0.0963)
Apostolic Sect	0.0259	0.0849	0.149
	(0.0158)	(0.0536)	(0.0923)
Zion	0.0242	0.0829	0.145
	(0.0202)	(0.0679)	(0.117)
Other Christian	-0.000271	0.000880	0.00327
	(0.0204)	(0.0701)	(0.121)
Islam	-0.0472	-0.161	-0.305
	(0.0452)	(0.172)	(0.309)
Traditional	0.0359	0.116	0.205
	(0.0336)	(0.106)	(0.179)
Other religion	0.0388	0.127	0.222
	(0.0325)	(0.105)	(0.179)
No religion	0.0342*	0.113*	0.197*
	(0.0184)	(0.0614)	(0.105)
N/a	0.0809***	0.250***	0.422***
	(0.0313)	(0.0930)	(0.155)
Household size	0.0180***	0.0578***	0.0978***
	(0.00358)	(0.0112)	(0.0188)
ln (Household income)	-0.0181***	-0.0592***	-0.101***
	(0.00367)	(0.0121)	(0.0205)
Household has mentally ill member	-0.00257	-0.00760	-0.0122
	(0.0112)	(0.0363)	(0.0612)
Household members with alive mother	-0.0164**	-0.0529**	-0.0896**
	(0.00657)	(0.0210)	(0.0357)
Household members with alive father	0.0113*	0.0357*	0.0615*
	(0.00583)	(0.0187)	(0.0319)

Household is located in rural area	-0.0454***	-0.144***	-0.250***
	(0.0123)	(0.0401)	(0.0689)
Bulawayo	-0.0231	-0.0645	-0.106
	(0.0283)	(0.0850)	(0.142)
Manicaland	-0.000613	0.00453	0.00333
	(0.0203)	(0.0594)	(0.0986)
Mash Central	-0.0655***	-0.196***	-0.335***
	(0.0193)	(0.0594)	(0.100)
Mash East	-0.0601***	-0.180***	-0.305***
	(0.0178)	(0.0542)	(0.0911)
Mash West	-0.0883***	-0.274***	-0.464***
	(0.0171)	(0.0527)	(0.0887)
Mat North	-0.108***	-0.340***	-0.581***
	(0.0195)	(0.0629)	(0.107)
Mat South	-0.0761***	-0.235***	-0.400***
	(0.0197)	(0.0626)	(0.106)
Midlands	-0.0729***	-0.221***	-0.376***
	(0.0176)	(0.0536)	(0.0901)
Masvingo	-0.0975***	-0.306***	-0.526***
	(0.0193)	(0.0624)	(0.107)
Constant	0.401***	-0.199	-0.288
	(0.0467)	(0.151)	(0.257)
Observations	11,733	11,733	11,733
R-squared	0.019		

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

5.3.1.2 Inferential analysis of underweight and household HIV/AIDS status

Columns (I) to (III) of

Table 28 shows that the larger proportion of HIV/AIDS affected households with underweight under 5 children depicted in Table 26 is not statistically valid after controlling for observed confounders.

Other results show that *ceteris paribus*, increasing household income reduces the probability of children being underweight by 0.644% while an increase in household size increases the probability of underweight children by 0.687% at 1% level of significance. Column (I) further reveals that increasing age of household head by 1% reduces the probability of underweight children by 0.058 at 5% level of significance.

Table 28. Relationship of household HIV/AIDS status and underweight children

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is affected	0.0118	0.0701	0.139
	(0.00865)	(0.0499)	(0.0978)
Household head is female	0.00300	0.0157	0.0393
	(0.00741)	(0.0479)	(0.0960)
Household head age	-0.000584**	-0.00363**	-0.00725**
	(0.000254)	(0.00161)	(0.00327)
Married living together	-0.00799	-0.0520	-0.102
	(0.0192)	(0.114)	(0.224)
Married living apart	-0.00532	-0.0344	-0.0700
	(0.0208)	(0.126)	(0.248)
Divorced/separated	0.000642	0.00194	-0.00655
	(0.0220)	(0.129)	(0.253)
Widow/widower	0.00125	0.00485	0.00992
	(0.0216)	(0.128)	(0.253)
Primary level	0.00151	0.0102	0.0200
	(0.0115)	(0.0688)	(0.136)
ZJC level	0.0118	0.0671	0.129
	(0.0137)	(0.0790)	(0.156)
O' level	-0.0125	-0.0766	-0.154
	(0.0122)	(0.0738)	(0.147)
A' level	-0.0380**	-0.279**	-0.576**
	(0.0165)	(0.125)	(0.260)
Diploma/Certificate after primary	-0.00837	-0.0425	-0.107
	(0.0379)	(0.268)	(0.545)
Diploma/Certificate after secondary	-0.0330*	-0.239*	-0.510*
	(0.0169)	(0.131)	(0.275)
Graduate/Post-Graduate	-0.0379**	-0.316**	-0.646*
	(0.0182)	(0.160)	(0.346)
Protestant	-0.0191	-0.135	-0.276
	(0.0119)	(0.0870)	(0.178)
Pentecostal	-0.00677	-0.0389	-0.0850
	(0.0107)	(0.0726)	(0.147)
Apostolic Sect	0.00601	0.0400	0.0777
	(0.0105)	(0.0695)	(0.140)
Zion	0.00747	0.0533	0.101
	(0.0135)	(0.0874)	(0.175)
Other Christian	-0.00441	-0.0237	-0.0530
	(0.0136)	(0.0910)	(0.184)
Islam	0.00851	0.0640	0.0964
	(0.0339)	(0.204)	(0.405)
Traditional	0.0358	0.198	0.394
	(0.0244)	(0.128)	(0.246)
Other religion	-0.0216	-0.166	-0.327
	(0.0188)	(0.150)	(0.314)
No religion	0.0174	0.110	0.216
	(0.0125)	(0.0789)	(0.158)

Household size	0.00687***	0.0419***	0.0829***
	(0.00239)	(0.0141)	(0.0273)
ln (Household income)	-0.00644***	-0.0413***	-0.0842***
	(0.00239)	(0.0155)	(0.0306)
Household has mentally ill member	0.0118	0.0717	0.134
	(0.00806)	(0.0442)	(0.0839)
Household members with alive mother	-0.00351	-0.0217	-0.0436
	(0.00435)	(0.0260)	(0.0504)
Household members with alive father	0.00150	0.00801	0.0195
	(0.00396)	(0.0234)	(0.0456)
Household is located in rural area	-0.0163**	-0.0991*	-0.204*
	(0.00816)	(0.0528)	(0.107)
Bulawayo	0.0608***	0.304***	0.584***
	(0.0220)	(0.101)	(0.188)
Manicaland	0.00630	0.0394	0.0751
	(0.0130)	(0.0768)	(0.150)
Mash Central	-0.0111	-0.0682	-0.139
	(0.0127)	(0.0779)	(0.155)
Mash East	-0.0168	-0.110	-0.216
	(0.0114)	(0.0725)	(0.145)
Mash West	-0.0133	-0.0837	-0.168
	(0.0112)	(0.0690)	(0.137)
Mat North	-0.0246*	-0.159*	-0.317*
	(0.0128)	(0.0826)	(0.166)
Mat South	-0.0149	-0.0991	-0.192
	(0.0131)	(0.0836)	(0.169)
Midlands	-0.00896	-0.0533	-0.110
	(0.0115)	(0.0705)	(0.140)
Masvingo	-0.0334***	-0.230***	-0.474***
	(0.0121)	(0.0851)	(0.174)
Constant	0.141***	-1.018***	-1.662***
	(0.0316)	(0.194)	(0.383)
Observations	11,733	11,733	11,733
R-squared	0.010		

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

5.4 Morbidity in under 5 children

5.4.1 Descriptive analysis of incidence of diarrhoeal disease

Table 29 shows the prevalence of reported incidences of diarrhoea in children under five years old two weeks prior the surveys for the HIV/AIDS affected and unaffected households. The findings in the table point to statistical homogeneity in the incidences of diarrhoeal diseases before controlling for observed confounding variables.

Table 29. Incidences of diarrhoeal disease by HIV/AIDS status

	National	HIV/AIDS status		Difference
	[N]	Yes [Y]	No [N]	[Y - N]
Mean	0.127	0.132	0.126	0.006

S. D	0.363	0.372	0.361
Min	0	0	0
Max	4	3	4

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

5.4.1.1 Inferential analysis of HIV/AIDS and the incidence of diarrhoeal diseases

After controlling for observed confounders, Table 30 reveals that at 10% level of significance, a child from an HIV/AIDS affected household is 1.53% more likely to suffer from diarrhoea.

The results further indicate that an increase in household income, age and education level of household head decreases the likelihood of the incidence of diarrhoea. For example, *ceteris paribus*, increasing income of an affected household by 1% increases the probability of reducing the incidence of diarrhoea by 1.21% and attainment of Graduate/Post-Graduate qualification by the household head reduces the incidence of diarrhoea by 7.36% at the 1% level of significance.

However, Table 30 shows that marital status, e.g. married and living together or married and living apart, and an increase in household size are likely to increase the incidence of diarrhoea in the HIV/AIDS affected households at 1% level of significance.

Table 30. OLS estimates of the relationship of household HIV/AIDS status and the incidences of diarrhoeal

Household is affected	0.0153*
	(0.00788)
Household head is female	-0.00701
	(0.00718)
Household head age	-0.00302***
	(0.000206)
Married living together	0.0794***
	(0.0103)
Married living apart	0.0721***
	(0.0132)
Divorced/separated	0.0657***
	(0.0132)
Widow/widower	0.0770***
	(0.0124)
Primary level	-0.0357***
	(0.00926)
ZJC level	-0.0396***
	(0.0113)
O' level	-0.0473***
	(0.0106)

A' level	-0.0506***
	(0.0190)
Diploma/Certificate after primary	-0.0490*
	(0.0261)
Diploma/Certificate after secondary	-0.0930***
	(0.0152)
Graduate/Post-Graduate	-0.0736***
	(0.0178)
Protestant	-0.00348
	(0.0111)
Pentecostal	-0.0185*
	(0.00970)
Apostolic Sect	-0.00162
	(0.00957)
Zion	-0.0140
	(0.0118)
Other Christian	-0.0333***
	(0.0110)
Islam	0.0390
	(0.0353)
Traditional	0.0423*
	(0.0219)
Other religion	0.0162
	(0.0216)
No religion	0.0140
	(0.0116)
Household size	0.0222***
	(0.00255)
ln (Household income)	-0.0121***
	(0.00229)
Household has mentally ill member	-0.00882
	(0.00665)
Household members with alive mother	-0.00403
	(0.00433)
Household members with alive father	0.0130***
	(0.00395)
Household is located in rural area	-0.0647***
	(0.00781)
Bulawayo	-0.0598***
	(0.0159)
Manicaland	-0.0341***
	(0.0124)
Mash Central	-0.0109
	(0.0135)
Mash East	-0.0347***
	(0.0120)
Mash West	0.0278**
	(0.0125)
Mat North	-0.0405***
	(0.0129)
Mat South	-0.0433***
	(0.0120)
Midlands	0.0153
	(0.0127)
Masvingo	-0.00505
	(0.0130)

Constant	0.227*** (0.0243)
Observations	19,184
R-squared	0.054

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

5.4.2 Descriptive analysis of Cough

Table 31 shows the prevalence of reported incidences of cough in children under five years old two weeks prior the surveys for both HIV/AIDS affected and unaffected households. The difference in the incidence of cough between affected and unaffected households is not statistically significant valid before controlling for household characteristics. However, 29.6% of the children in the HIV/AIDS affected households suffered from cough two weeks prior to the survey while in the unaffected households it was 28.4% of the children.

Table 31. Incidence of cough by household HIV/AIDS status

	National	HIV/AIDS status		Difference
	[N]	Yes [Y]	No [N]	[Y-N]
Mean	0.285	0.296	0.284	0.012
S. D	0.529	0.555	0.525	
Min	0	0	0	
Max	4	4	4	

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

5.4.2.1 Inferential analysis of household HIV/AIDS status and the incidence of cough

The results presented in Table 32 reveal that after controlling for observed confounders, there is 1.86% more likelihood of a child from an HIV/AIDS affected household to suffer from cough at the 10% level of significance.

The results presented in Table 32 reveal that *ceteris paribus*, a child from a household located in the rural areas is 5.415% less likely to suffer from cough, at 1% level of significance, than a child from a household located in urban areas. In addition, the results reveal that an increase in household income, age and education level of household head decreases the likelihood of the incidence of cough in under 5 children. For example, *ceteris paribus*, an increase in the age of household head by one decreases the incidence of cough by 0.537%, while attainment of a

Diploma/Certificate after primary education reduces the incidence of cough in the HIV affected households by 12.6% at the 1% level of significance.

Similarly, to the effect of marital status on the incidence of diarrhoea, marital status, e.g. married and living together or married and living apart, increases the likelihood of the incidence of cough in the HIV/AIDS affected households at 1% level of significance. In addition, an increase in household size has the same effect. More so, the results show that everything being constant, increasing household size by 1% is likely to increase the incidence of cough by 3.17% at the 1% level of significance.

The provincial dummies indicate that in comparison to the base province of Bulawayo, living in Manicaland, Matabeleland North, Matabeleland South and Masvingo have an increased likelihood of reducing the incidence of cough, while living in Mashonaland West and Midlands increases the probability of the incidence of cough in children under 5 years in the HIV/AIDS affected households.

Table 32. Relationship of household HIV status and the incidence of cough

Household is affected	0.0186*
	(0.0113)
Household head is female	0.00506
	(0.00971)
Household head age	-0.00537***
	(0.000292)
Married living together	0.153***
	(0.0155)
Married living apart	0.132***
	(0.0194)
Divorced/separated	0.105***
	(0.0196)
Widow/widower	0.147***
	(0.0186)
Primary level	-0.0340***
	(0.0131)
ZJC level	-0.0467***
	(0.0155)
O' level	-0.0717***
	(0.0145)
A' level	-0.0501**
	(0.0254)
Diploma/Certificate after primary	-0.00981
	(0.0428)
Diploma/Certificate after secondary	-0.126***
	(0.0215)

Graduate/Post-Graduate	-0.0991***
	(0.0256)
Protestant	0.00105
	(0.0155)
Pentecostal	-0.00570
	(0.0138)
Apostolic Sect	0.0204
	(0.0135)
Zion	-0.0174
	(0.0167)
Other Christian	-0.0125
	(0.0164)
Islam	0.00374
	(0.0404)
Traditional	-0.00740
	(0.0282)
Other religion	-0.0213
	(0.0277)
No religion	0.0349**
	(0.0161)
Household size	0.0317***
	(0.00346)
ln (Household income)	-0.0143***
	(0.00324)
Household has mentally ill member	0.00386
	(0.0112)
Household members with alive mother	0.0142**
	(0.00616)
Household members with alive father	0.0260***
	(0.00578)
Household is located in rural area	-0.0541***
	(0.0110)
Bulawayo	-0.105***
	(0.0211)
Manicaland	-0.0806***
	(0.0163)
Mash Central	0.0166
	(0.0183)
Mash East	-0.000710
	(0.0164)
Mash West	0.0347**
	(0.0162)
Mat North	-0.0424**
	(0.0178)
Mat South	-0.0514***
	(0.0170)
Midlands	0.0480***
	(0.0169)
Masvingo	-0.0421**
	(0.0170)

Constant	0.305*** (0.0340)
Observations	19,184
R-squared	0.090

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

5.4.3 Descriptive analysis for the incidence of fever

Table 33 shows the prevalence of reported incidences of fever in children under five years in the surveyed households. The table displays statistical homogeneity in the probability that a child was affected by fever between households affected by HIV/AIDS versus those that are not affected.

Table 33. Incidence of fever by household HIV/AIDS status

	National	HIV/AIDS status		Difference
	[N]	Yes [Y]	[N]	[Y-U]
Mean	0.192	0.207	0.190	0.017
S. D	0.446	0.472	0.441	
Min	0	0	0	
Max	5	3	5	

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

5.4.3.1 Inferential analysis of HIV and the incidence of fever

The results presented in Table 34 show that everything being constant, *there is* no statistically significant difference in the probability of a child suffering from fever between HIV/AIDS affected and unaffected households.

An increase in the age and education level of household head and in household income decreases the likelihood of the incidence of fever at the 1% level of significance. Specifically, Column (I) of the table shows that an increase in the age of the household head by one year will ceteris paribus, result in a decrease in the probability of fever incidence by 0.3587%. Furthermore, increasing household income by 1% is likely to reduce the incidence of fever by 1.07% at the 1% level of significance. In addition, the results reveal that a child from a household located in the rural areas is 2.74% less likely to suffer from fever than a child in urban areas.

Table 34 shows that all forms of marital status increase the likelihood of the incidence of fever in under 5 children at the 1% level of significance. Furthermore, increasing household size by 1% is likely to increase the incidence of fever by 2.31% at the 1% level of significance. The provincial dummies indicate that in comparison to the base province of Harare, living in Midlands Province has an increased likelihood of increasing the incidence of fever at the 1% level of significance.

Table 34. OLS estimates of the relationship of household HIV/AIDS status and the incidence of fever

Household is affected	0.0120
	(0.00958)
Household head is female	-0.00109
	(0.00815)
Household head age	-0.00358***
	(0.000254)
Married living together	0.0978***
	(0.0125)
Married living apart	0.0894***
	(0.0159)
Divorced/separated	0.0724***
	(0.0160)
Widow/widower	0.0894***
	(0.0148)
Primary level	-0.0313***
	(0.0116)
ZJC level	-0.0521***
	(0.0133)
O' level	-0.0558***
	(0.0127)
A' level	-0.0661***
	(0.0209)
Diploma/Certificate after primary	-0.105***
	(0.0258)
Diploma/Certificate after secondary	-0.104***
	(0.0181)
Graduate/Post-Graduate	-0.0800***
	(0.0210)
Protestant	0.0152
	(0.0133)
Pentecostal	-0.000743
	(0.0114)
Apostolic Sect	0.0210*
	(0.0112)
Zion	0.00959
	(0.0142)
Other Christian	-0.00975

	(0.0133)
Islam	0.0249
	(0.0362)
Traditional	0.0231
	(0.0266)
Other religion	0.0442*
	(0.0261)
No religion	0.0346**
	(0.0136)
N/a	0.00177
	(0.0212)
Household size	0.0231***
	(0.00292)
ln (Household income)	-0.0107***
	(0.00273)
Household has mentally ill member	-0.00122
	(0.0101)
Household members with alive mother	0.0112*
	(0.00577)
Household members with alive father	0.0147***
	(0.00552)
Household is located in rural area	-0.0274***
	(0.00933)
Bulawayo	-0.0385**
	(0.0182)
Manicaland	-0.0237*
	(0.0135)
Mash Central	-0.0135
	(0.0144)
Mash East	0.00774
	(0.0133)
Mash West	0.0212
	(0.0130)
Mat North	-0.0183
	(0.0147)
Mat South	-0.0213
	(0.0140)
Midlands	0.0808***
	(0.0142)
Masvingo	-0.00719
	(0.0140)
Constant	0.192***
	(0.0294)
Observations	19,184
R-squared	0.061

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

5.5 Child nutrition and household HIV/AIDS status

Breastfeeding remains a common practice in parts of the world where the burden of HIV/AIDS is highest and the fewest alternative feeding options exist. The impossible dilemma faced by HIV-positive mothers is whether to breastfeed their infants in keeping with cultural norms but in doing so risk transmitting the virus through breast milk, or to pursue formula feeding, which comes with its own set of risks, including a higher rate of infant mortality from diarrhoeal illnesses, while reducing transmission of HIV[19]. According to a study carried out in South Africa, breastfeeding when done exclusively is associated with approximately a 4 per cent risk of acquiring infection at 6 months, in infants who were negative at 6 weeks of age. The study reviewed that the mortality in the first 3 months of life more than doubled in children who were receiving replacement feeding compared to those who were exclusively breastfed[20]. Therefore, the decision on infant feeding practice in the era of HIV is a big challenge for caretakers and health care providers[21]. Even though exclusive breastfeeding is the best choice of feeding option in the first 6 months of the postnatal period, mother-to-child HIV transmission through breastfeeding is a major concern[22].

5.5.1 Descriptive analysis for children under 5 ever breastfed

Table 35 shows the average number of children under 5 years that were ever breastfed by the HIV/AIDS status of the household. The table reveals no statistically significant difference in the average number of under 5 children that were ever breastfed between the HIV affected households and those that are not affected before controlling for observed confounding variables.

Table 35. Ever breast-fed children by HIV/AIDS status

	National	HIV/AIDS status		Mean difference
		Yes [Y]	No [N]	
Mean	0.278	0.273	0.279	-0.006
S.D	0.479	0.497	0.477	

[19] Slater, M., Stringer, E.M. & Stringer, J.S.A. Breastfeeding in HIV-Positive Women. *Pediatr-Drugs* 12, 1–9 (2010).
[20] Coovadia, Hoosen, et al. 'Mother-to-child-transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study', The Lancet, vol. 369, 31 March 2007, p. 1107-1116
[21] Leshabari et al. (2007). Difficult choices: Infant feeding experiences of HIV-positive mothers in northern Tanzania. *SAHARA J 4(1):544-55.*
[22] Doherty et al. (2006). A longitudinal qualitative study of infant-feeding decision making and practices among HIV-positive women in South Africa. *Journal of Nutrition, 136(9):2421-6*

Min	0	0	0
Max	7	7	3

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

5.5.1.1 Inferential analysis of household HIV/AIDS status and children breastfeeding

The results presented in Table 36 mirror those in the previous table and confirm that after controlling for confounding variables, there is no statistically significant difference in the average number of children that were ever breastfed between households that are affected by HIV and those that are not affected.

Furthermore, an increase in the age and education of the household head and in household income, reduces the likelihood that children under 5 years are breastfed, at the 1% level of significance. On the other hand, the results show that marital status, in all its forms, increases the probability of children under 5 being breastfed at the 1% level of significance, *ceteris paribus*.

Table 36. OLS estimates of the relationship of household HIV/AIDS status and children ever breastfed

Household is affected	-0.00580
	(0.00990)
Household head is female	-0.00324
	(0.00881)
Household head age	-0.00707***
	(0.000267)
Married living together	0.143***
	(0.0151)
Married living apart	0.127***
	(0.0183)
Divorced/separated	0.0981***
	(0.0182)
Widow/widower	0.153***
	(0.0179)
Primary level	-0.0327***
	(0.0117)
ZJC level	-0.0431***
	(0.0140)
O' level	-0.0447***
	(0.0132)
A' level	-0.0278
	(0.0229)
Diploma/Certificate after primary	-0.0905***
	(0.0330)
Diploma/Certificate after secondary	-0.0807***
	(0.0202)
Graduate/Post-Graduate	-0.0718***
	(0.0227)

Protestant	0.0117
	(0.0139)
Pentecostal	-0.00979
	(0.0121)
Apostolic Sect	0.00759
	(0.0118)
Zion	-0.00162
	(0.0158)
Other Christian	-0.0175
	(0.0146)
Islam	0.00830
	(0.0347)
Traditional	0.0479
	(0.0307)
Other religion	-0.00537
	(0.0269)
No religion	0.0114
	(0.0141)
N/a	-5.78e-05
	(0.0230)
Household size	0.0511***
	(0.00328)
ln (Household income)	-0.00778***
	(0.00299)
Household has mentally ill member	-0.0131
	(0.00940)
Household members with alive mother	-0.0147**
	(0.00583)
Household members with alive father	0.0275***
	(0.00528)
Household is located in rural area	-0.00635
	(0.00992)
Bulawayo	0.0307
	(0.0207)
Manicaland	0.0258*
	(0.0141)
Mash Central	0.0889***
	(0.0158)
Mash East	0.0725***
	(0.0137)
Mash West	0.0661***
	(0.0133)
Mat North	0.0869***
	(0.0159)
Mat South	0.0790***
	(0.0150)
Midlands	0.0854***
	(0.0139)
Masvingo	0.0426***
	(0.0146)
Constant	0.213***
	(0.0313)
Observations	19,184
R-squared	0.108

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

5.5.2 Descriptive analysis of breast-feeding advice by HIV/AIDS status

The results in Table 37 show that the difference between HIV/AIDS affected and unaffected households that received breastfeeding advice is not statistically significant before controlling for observed confounders. The results show that 21.8% of the affected households received advice on breastfeeding while 21.9% of unaffected households also received the advice.

Table 37. Breast feeding advice by HIV/AIDS status

	National	HIV/AIDS status		Difference
	[N]	Yes [Y]	No [N]	[R-U]
Mean	0.219	0.218	0.219	-0.001
S.D	0.436	0.448	0.434	
Min	0	0	0	
Max	4	4	3	

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

5.5.2.1 Inferential analysis of HIV/AIDS and breast-feeding advice

Table 38 presents results for the correlates between HIV/AIDS status and breastfeeding advice. The results mirror those for the relationship between household HIV status and ever breastfeeding, section 5.5.1.1. The results indicate no statistically significant difference in the probability of getting breast feeding advice between households affected by HIV/AIDS and those that are not affected after controlling for observed confounding variables.

Table 38 shows that an increase in the age and education level of household head and in household income reduces the likelihood of getting advice on breastfeeding, at the 1% level of significance. On the other hand, the results show that in comparison to single household heads, other forms of marital status of the household head, and an increase in household size increases the probability of getting advice on breastfeeding at the 1% level of significance, *ceteris paribus*.

Table 38. OLS estimates of the relationship of household HIV status and breast-feeding advice

Household is HIV positive	-0.00150
	(0.00903)
Household head is female	0.0114
	(0.00823)
Household head age	-0.00560***

	(0.000245)
Married living together	0.126***
	(0.0140)
Married living apart	0.0952***
	(0.0169)
Divorced/separated	0.0706***
	(0.0167)
Widow/widower	0.127***
	(0.0166)
Primary level	-0.0248**
	(0.0108)
ZJC level	-0.0363***
	(0.0128)
O' level	-0.0272**
	(0.0122)
A' level	-0.0111
	(0.0217)
Diploma/Certificate after primary	-0.0527*
	(0.0312)
Diploma/Certificate after secondary	-0.0510***
	(0.0190)
Graduate/Post-Graduate	-0.0455**
	(0.0213)
Protestant	0.0112
	(0.0130)
Pentecostal	-0.00712
	(0.0114)
Apostolic Sect	-0.00121
	(0.0111)
Zion	-0.000278
	(0.0146)
Other Christian	-0.0323**
	(0.0133)
Islam	-0.00660
	(0.0311)
Traditional	0.0259
	(0.0256)
Other religion	-0.0339
	(0.0237)
No religion	0.00683
	(0.0132)
N/a	-0.0124
	(0.0212)
Household size	0.0395***
	(0.00293)
ln (Household income)	-0.00674**
	(0.00269)
Household has mentally ill member	-0.00838
	(0.00856)
Household members with alive mother	-0.0112**
	(0.00525)
Household members with alive father	0.0195***
	(0.00475)
Household is located in rural area	-0.0181**
	(0.00909)
Bulawayo	0.0375*

	(0.0194)
Manicaland	0.0232*
	(0.0129)
Mash Central	0.0770***
	(0.0148)
Mash East	0.0767***
	(0.0129)
Mash West	0.0488***
	(0.0123)
Mat North	0.0743***
	(0.0146)
Mat South	0.0856***
	(0.0140)
Midlands	0.0550***
	(0.0128)
Masvingo	0.0449***
	(0.0135)
Constant	0.164***
	(0.0282)
Observations	19,184
R-squared	0.080

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

5.6 WASH and HIV status

HIV weakens the immune system of infected persons increasing their susceptibility to other infections. Certain enteric pathogens, especially intestinal parasites, have been more commonly identified among PLWHIV, causing more severe and longer-lasting illness[23]. Because of the increased risk of adverse consequences of diarrhoeal illness, improving access to adequate water and sanitation facilities for people living with HIV is especially important[24]. As such, improving drinking water quality, sanitation, and hygiene (WASH) practices among PLWHIV is important.

5.6.1 Descriptive analysis for WASH

Table 39 shows the HIV/AIDS affected versus unaffected differences in Water Sanitation and Hygiene (WASH). The table shows that 78.8% of the HIV/AIDS affected households had access to improved water sources versus the 81.7% of the unaffected households. The difference is in proportions of 2.8% is not statistically valid. Concerning open defecation, Table 39 shows that 24.0% of the affected households practiced open defecation whist for unaffected household its 17.5%. In

[23] *Nkenfou et al. (2013)*. Intestinal parasitic infections in HIV infected and non-infected patients in a low HIV prevalence region, West-Cameroon. *PLoS One. 8(2): 57914*

[24] Ngwenya and Kagathi (2006). HIV/AIDS and access to water: A case study of home-based care in Ngamiland Botswana. Phys Chem Earth Parts 31: 669–680

addition, the results indicate that 22.5% of the affected households had access to hand washing stations whist 31.7% of the unaffected did not have access. In summary, the findings in the table show no statistically significant difference in the WASH of the affected versus unaffected households before controlling for observed covariates.

Table 39. WASH by Household HIV/AIDS status

	National		Yes [Y]		No [N]		Mean
	Mean	S. D	Mean	S. D	Mean	S. D	difference
Improved water source	0.813	0.390	0.788	0.408	0.817	0.387	-0.028
Open defecation	0.184	0.387	0.240	0.427	0.175	0.380	0.065
Hand washing station	0.305	1.910	0.225	0.456	0.317	2.035	-0.092

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

5.6.1.1 Inferential analysis for access to improved water facilities

Table 40 shows correlates between household HIV/AIDS status and access to improved water sources. Consistent with the descriptive statistics presented above, there is no statistically significant heterogeneity in the access to improved water sources by the HIV/AIDS status of the household even after controlling for observed confounders.

The results in Columns (I) to (III) reveal that a female headed household, age and education of the household head and an increase in household income increases the household's likelihood to access improved water facilities. For example, Column (I) show that a female headed household has a 3.03% increased probability of the household accessing improved water facilities. Column (III) reveals that increasing household income by 1% increases the probability of the household accessing improved water facilities by 10.2% at the 1% level of significance.

Furthermore, the results show that households that are members of the Apostolic Sect and located in the rural areas have a 3.16% and 17.5% reduced probability of accessing improved water facilities. The provincial dummies indicate that in comparison to the base province of Harare, households located in Manicaland and Matabeleland South have a reduced likelihood of accessing improved water

facilities while those located in Bulawayo, Mashonaland East and Matabeleland North have an increased probability of accessing improved water facilities at the 1% level of significance.

Table 40. Relationship of household HIV/AIDS status and access to improved water sources

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is HIV positive	-0.00349	-0.0241	-0.0394
	(0.00819)	(0.0342)	(0.0603)
Household head is female	0.0303***	0.176***	0.306***
	(0.00604)	(0.0360)	(0.0669)
Household head age	0.00185***	0.00757***	0.0131***
	(0.000228)	(0.000973)	(0.00172)
Married living together	-0.0189*	-0.117	-0.221
	(0.0113)	(0.0761)	(0.141)
Married living apart	-0.0173	-0.112	-0.218
	(0.0139)	(0.0851)	(0.156)
Divorced/separated	-0.0202	-0.143*	-0.277*
	(0.0142)	(0.0864)	(0.159)
Widow/widower	-0.0149	-0.138*	-0.263*
	(0.0143)	(0.0839)	(0.154)
Primary level	0.0454***	0.157***	0.258***
	(0.0118)	(0.0395)	(0.0671)
ZJC level	0.0654***	0.224***	0.372***
	(0.0133)	(0.0485)	(0.0836)
O' level	0.107***	0.417***	0.708***
	(0.0123)	(0.0449)	(0.0777)
A' level	0.139***	0.732***	1.328***
	(0.0149)	(0.105)	(0.216)
Diploma/Certificate after primary	0.113***	0.621***	1.072***
	(0.0227)	(0.196)	(0.389)
Diploma/Certificate after secondary	0.120***	0.730***	1.420***
	(0.0139)	(0.111)	(0.234)
Graduate/Post-Graduate	0.0981***	0.451***	0.836***
	(0.0160)	(0.112)	(0.231)
Protestant	-0.00506	-0.0125	-0.0296
	(0.0104)	(0.0599)	(0.110)
Pentecostal	-0.00932	-0.0343	-0.0634
	(0.00890)	(0.0528)	(0.0981)
Apostolic Sect	-0.0316***	-0.149***	-0.278***
	(0.00926)	(0.0478)	(0.0869)
Zion	-0.0208	-0.104*	-0.188*
	(0.0131)	(0.0589)	(0.105)
Other Christian	-0.0144	-0.0813	-0.172
	(0.0115)	(0.0609)	(0.111)
Islam	-0.0448	-0.232*	-0.460*
	(0.0291)	(0.133)	(0.244)
Traditional	-0.0363	-0.160*	-0.300**
	(0.0229)	(0.0848)	(0.148)
Other religion	-0.0188	-0.0904	-0.205

	(0.0210)	(0.0959)	(0.171)
No religion	-0.0271**	-0.134**	-0.251**
	(0.0113)	(0.0548)	(0.0991)
N/a	-0.0442**	-0.227***	-0.428***
	(0.0184)	(0.0858)	(0.154)
Household size	-0.000198	-0.00374	-0.00406
	(0.00216)	(0.0106)	(0.0190)
ln (Household income)	0.0122***	0.0574***	0.102***
	(0.00232)	(0.0106)	(0.0190)
Household has mentally ill member	0.00283	0.0154	0.0247
	(0.00886)	(0.0279)	(0.0469)
Household members with alive mother	-0.0143***	-0.0534***	-0.0938***
	(0.00452)	(0.0180)	(0.0314)
Household members with alive father	0.00574	0.0215	0.0364
	(0.00424)	(0.0161)	(0.0279)
Household is located in rural area	-0.175***	-0.806***	-1.506***
	(0.00747)	(0.0365)	(0.0702)
Bulawayo	0.0535***		
	(0.00600)		
Manicaland	-0.0450***	-0.166***	-0.234*
	(0.0110)	(0.0617)	(0.124)
Mash Central	0.0341***	0.205***	0.372***
	(0.0106)	(0.0628)	(0.124)
Mash East	0.0281***	0.153**	0.303**
	(0.00910)	(0.0604)	(0.121)
Mash West	0.0181**	0.134**	0.251**
	(0.00824)	(0.0581)	(0.117)
Mat North	0.105***	0.522***	0.960***
	(0.00987)	(0.0686)	(0.137)
Mat South	-0.0514***	-0.201***	-0.281**
	(0.0114)	(0.0628)	(0.126)
Midlands	-0.00152	0.0340	0.0573
	(0.00863)	(0.0581)	(0.117)
Masvingo	-0.00730	0.0154	0.0280
	(0.0101)	(0.0611)	(0.121)
Constant	0.735***	0.740***	1.336***
	(0.0251)	(0.129)	(0.238)
Observations	19,181	18,627	18,627
R-squared	0.117		

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

5.6.1.2 Inferential analysis for HIV/AIDS status and open defecation

Table 41 shows the determinants of open defecation amongst the surveyed households. The results in the table mirror those on access to improved water sources and reveal no statistically significant difference between households affected by HIV and those that are not affected in the propensity to practice open defecation.

Furthermore, being a female-headed household, increasing age and education of the household head and increasing household income reduce the likelihood of HIV/AIDS affected household practicing open defecation. In particular, results in Column (I) indicate that a female headed household has a 2.49% reduced likelihood of practicing open defecation and attainment of Graduate/Post-Graduate qualification by the household head increases the probability of the household not practicing open defecation by 7.78% at the 1% level of significance. On the other hand, the results reveal that households located in the rural areas are 24.9% more likely to practice open defecation at 1% level of significance as compared to their urban counterparts, *ceteris paribus*. In addition, households that are members of the Apostolic Sect, Zion and those that practice traditional religion have a high probability of practicing open defecation.

The provincial dummies indicate that in comparison to the base province of Harare, the province of Matabeleland North has the highest likelihood of practising open defecation of 19.2% after controlling for observed confounding variables. This result is statistically valid with 99% level of confidence.

Table 41. Relationship of household HIV/AIDS status and open defecation

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is HIV positive	0.00946	0.0542	0.0685
	(0.00769)	(0.0391)	(0.0659)
Household head is female	-0.0249***	-0.0798	-0.131
	(0.00519)	(0.0507)	(0.0874)
Household head age	-0.00245***	-0.0131***	-0.0223***
	(0.000208)	(0.00111)	(0.00191)
Married living together	0.0204**	0.216**	0.361**
	(0.00997)	(0.0966)	(0.167)
Married living apart	0.0204	0.121	0.201
	(0.0128)	(0.104)	(0.180)
Divorced/separated	0.0315**	0.204*	0.344*
	(0.0128)	(0.107)	(0.185)
Widow/widower	0.0360***	0.240**	0.380**
	(0.0130)	(0.102)	(0.176)
Primary level	-0.0555***	-0.276***	-0.474***
	(0.0113)	(0.0425)	(0.0725)
ZJC level	-0.0900***	-0.388***	-0.667***
	(0.0124)	(0.0547)	(0.0929)
O' level	-0.116***	-0.585***	-1.010***
	(0.0115)	(0.0508)	(0.0873)
A' level	-0.115***	-0.886***	-1.489***
	(0.0129)	(0.173)	(0.315)

Diploma/Certificate after primary	-0.125***	-1.462***	-2.760***
	(0.0173)	(0.464)	(1.045)
Diploma/Certificate after secondary	-0.104***	-1.159***	-2.092***
	(0.0124)	(0.215)	(0.438)
Graduate/Post-Graduate	-0.0778***	-0.809***	-1.420***
	(0.0128)	(0.265)	(0.512)
Protestant	0.00278	-0.0404	-0.0868
	(0.00919)	(0.0739)	(0.128)
Pentecostal	0.00282	-0.0140	-0.0382
	(0.00774)	(0.0666)	(0.116)
Apostolic Sect	0.0387***	0.257***	0.434***
	(0.00834)	(0.0565)	(0.0980)
Zion	0.0529***	0.245***	0.377***
	(0.0125)	(0.0667)	(0.113)
Other Christian	-0.00600	0.0236	0.0324
	(0.0102)	(0.0731)	(0.128)
Islam	-0.000923	-0.0328	-0.0576
	(0.0212)	(0.203)	(0.367)
Traditional	0.0602***	0.306***	0.515***
	(0.0216)	(0.0916)	(0.156)
Other religion	-0.0158	-0.0123	-0.0101
	(0.0183)	(0.117)	(0.202)
No religion	0.0458***	0.271***	0.450***
	(0.0103)	(0.0636)	(0.110)
N/a	0.0245	0.169	0.268
	(0.0150)	(0.114)	(0.192)
Household size	-0.00820***	-0.0623***	-0.112***
	(0.00195)	(0.0133)	(0.0228)
ln (Household income)	-0.0169***	-0.115***	-0.200***
	(0.00209)	(0.0126)	(0.0217)
Household has mentally ill member	0.00230	0.0203	0.0392
	(0.00868)	(0.0285)	(0.0480)
Household members with alive mother	0.0169***	0.0881***	0.146***
	(0.00438)	(0.0212)	(0.0352)
Household members with alive father	0.00253	0.0234	0.0488
	(0.00412)	(0.0185)	(0.0301)
Household is located in rural area	0.249***	2.199***	4.966***
	(0.00658)	(0.100)	(0.267)
Bulawayo	0.00988***		
	(0.00304)		
Manicaland	-0.0726***	-0.0312	0.376
	(0.00688)	(0.312)	(1.040)
Mash Central	-0.143***	-0.438	-0.302
	(0.00750)	(0.308)	(1.039)
Mash East	-0.0632***	0.0500	0.563
	(0.00618)	(0.306)	(1.035)
Mash West	0.0260***	0.549*	1.418
	(0.00578)	(0.304)	(1.034)
Mat North	0.192***	1.163***	2.468**
	(0.0107)	(0.302)	(1.032)
Mat South	0.0284***	0.591*	1.515
	(0.00816)	(0.304)	(1.033)
Midlands	0.0379***	0.655**	1.623

	(0.00620)	(0.302)	(1.032)
Constant	0.276***	-1.934***	-4.910***
	(0.0218)	(0.327)	(1.040)
Observations	18,993	18,440	18,440
R-squared	0.254		

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

5.6.1.3 Inferential analysis for access to hand washing station

Results in Column (I) of Table 42 shows that *ceteris paribus*, households with an HIV/AIDS positive member have a reduced probability of accessing a hand washing station by 7.46% at the 1% level of significance. The result is however not robust to change in model specification presented in Columns (II) and (III) of the table.

In addition, results in Column (I) indicate that at the 1% level of significance, households located in the rural areas have a 17.1% reduced likelihood of accessing hand washing stations as compared to their urban counterparts. Column (II) to (III) reveal that at the 1% level of significance, the probability of a household accessing a hand washing station increases as the age and education of household head increases. More so, a female headed household, an increase is household size and income increase the probability a household accessing a hand washing station.

The result of the religion dummies presented in Column (III) show those households that are members of the Apostolic Sect and Zion have a reduced probability of accessing a hand washing station than those households not members of these two religious groups.

Table 42. Relationship of household HIV/AIDS status and access to hand washing station

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is HIV positive	-0.0746***	-0.0367	-0.0667
	(0.0244)	(0.0371)	(0.0641)
Household head is female	0.130*	0.288***	0.495***
	(0.0693)	(0.0299)	(0.0501)
Household head age	0.00189	0.00976***	0.0171***
	(0.00174)	(0.00102)	(0.00175)
Married living together	-0.260	-0.124**	-0.209**
	(0.192)	(0.0564)	(0.0936)
Married living apart	-0.355*	-0.283***	-0.486***
	(0.200)	(0.0688)	(0.116)
Divorced/separated	-0.327	-0.267***	-0.440***
	(0.203)	(0.0693)	(0.116)
Widow/widower	-0.261	-0.326***	-0.539***
	(0.216)	(0.0679)	(0.114)

Primary level	0.0128	0.0779	0.152
	(0.0189)	(0.0550)	(0.0991)
ZJC level	0.131**	0.200***	0.372***
	(0.0618)	(0.0607)	(0.108)
O' level	0.137***	0.343***	0.620***
	(0.0401)	(0.0567)	(0.101)
A' level	0.227	0.479***	0.837***
	(0.159)	(0.0788)	(0.135)
Diploma/Certificate after primary	0.140***	0.624***	1.079***
	(0.0531)	(0.124)	(0.204)
Diploma/Certificate after secondary	0.130***	0.588***	1.002***
	(0.0461)	(0.0751)	(0.130)
Graduate/Post-Graduate	0.138**	0.575***	0.984***
	(0.0569)	(0.0831)	(0.142)
Protestant	0.244*	0.0925*	0.154*
	(0.140)	(0.0482)	(0.0806)
Pentecostal	-0.0166	-0.0861**	-0.154**
	(0.0739)	(0.0426)	(0.0716)
Apostolic Sect	-0.0957	-0.147***	-0.261***
	(0.0639)	(0.0429)	(0.0729)
Zion	-0.0396	-0.154**	-0.276***
	(0.0819)	(0.0599)	(0.104)
Islam	-0.154*	-0.296**	-0.479**
	(0.0791)	(0.131)	(0.226)
Traditional	-0.0639	-0.166	-0.346
	(0.0690)	(0.117)	(0.212)
No religion	-0.0817	-0.138***	-0.228**
	(0.0688)	(0.0523)	(0.0892)
Household size	-0.00270	0.0337***	0.0575***
	(0.0121)	(0.00979)	(0.0167)
ln (Household income)	0.0381***	0.100***	0.172***
	(0.0136)	(0.0108)	(0.0188)
Household members with alive mother	0.000380	-0.0431**	-0.0726**
	(0.0190)	(0.0206)	(0.0362)
Household is located in rural area	-0.171***	-0.711***	-1.255***
	(0.0333)	(0.0365)	(0.0657)
Bulawayo	-0.307**	0.329***	0.526***
	(0.140)	(0.0627)	(0.103)
Manicaland	-0.435***	-0.0505	-0.0722
	(0.136)	(0.0470)	(0.0782)
Mash Central	-0.450***	-0.316***	-0.544***
	(0.126)	(0.0530)	(0.0905)
Mash East	-0.501***	-0.358***	-0.581***
	(0.133)	(0.0453)	(0.0763)
Mash West	-0.489***	-0.322***	-0.542***
	(0.128)	(0.0431)	(0.0715)
Mat North	0.00384	0.311***	0.529***
	(0.172)	(0.0545)	(0.0914)
Mat South	-0.464***	-0.125**	-0.248***
	(0.136)	(0.0518)	(0.0881)
Midlands	-0.482***	-0.178***	-0.291***
	(0.137)	(0.0441)	(0.0731)
Masvingo	-0.442***	-0.00616	-0.0145

	(0.141)	(0.0491)	(0.0822)
Constant	0.686***	-1.415***	-2.444***
	(0.259)	(0.118)	(0.203)
Observations	15,842	15,842	15,842
R-squared	0.020		

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

5.7 Chapter Summary

5.7.1 Household consumption patterns

- HIV/AIDS affected households consume less number of adult meals (2.224) than their unaffected counterparts (2.325).
- There is an association between HIV/AIDS household status and adult number of meals; at the 1% level of significance households with a PLWHIV consume 0.0359 less number of adult meals.
- Increasing the age of household head by 1% is associated with a decline in the household number of adult meals of 0.00126.
- Female-headed households are likely to have an increased number of adult meals by 0.0519 at the 1% level of significance.
- An increase in the education of household head increases the probability of the household consuming an increased number of adult meals.
- Attainment of A' Level and Graduate/Post-Graduate by the household head increases the adult number of meals by 0.186 and 0.300,
- Rural households consume 0.168 more adult meals than their urban counterparts holding everything else constant at the 1% level of significance.
- Increasing income of HIV/AIDS by 1% increases consumption of adult meals by 0.0255.
- Being traditional reduces the probability of achieving number of adult meals by 0.107.

5.7.2 Food Consumption Score (FCS)

- At least 54.3% of HIV/AIDS unaffected households had an acceptable food consumption score versus the 41.9% for the affected households.
- A larger proportion of affected households had borderline (31%) and poor (27.1%) food consumption scores than their unaffected counterparts, 26.2% and 19.5%, respectively.
- HIV/AIDS affected households are 5.88% less likely to achieve an acceptable FCS than unaffected households.
- Households that are members of the Apostolic Sect, Zion and Traditional religion, have the probability of achieving an acceptable FCS lowered by 5.76%, 5.55% and 9.22%, respectively.

- An increase in age and education level of the household head and income of the household increases the likelihood of HIV/AIDS affected households having an acceptable FCS.
- Increasing the age of household head by 1%, increases the probability of the affected household achieving an acceptable FCS by 0.118%, while attaining Graduate/Post-Graduate level increases the probability of achieving an acceptable FCS by 20.6% at the 1% level of significance.
- Rural households had a 12.75 increased probability of achieving an acceptable FSC *vis-à-vis* their urban counterparts.

5.7.3 Household Dietary Diversity Score (HDDS)

- Households that are affected by HIV/AIDS had an average HDDS of 5.203 versus 5.549 points for the unaffected households.
- The finding indicates that households that are affected by HIV/AIDS on average consume less food groups than households that are not affected by HIV/AIDS before controlling for observed confounders.
- Households with a member who is HIV positive are 13.2% less likely to achieve an acceptable HDDS.
- Being a member of the Apostolic Sect and practicing Traditional religion decreases the likelihood of the household achieving an acceptable HDDS by 15.2% and 38%, respectively.
- A female headed household and an increase in age and education of household head increases the probability of the affected household achieving an acceptable HDDS.
- Increasing the age of household head by 1% increases the probability of the household achieving an acceptable HDDS by 0.48% and by 13.6% if the household head is female, *ceteris paribus*.
- The provincial dummies indicate that in comparison to the base province of Bulawayo, save for Matabeleland North province, all the other provinces have an increased likelihood of achieving an acceptable HDDS.

5.7.4 Household Hunger Scale (HHS)

- HIV/AIDS affected households are in more hunger than unaffected households in terms of all components of the household hunger score by a factor of 0.128 points.
- Households with PLWHIV, had an increased probability for an increased household hunger by 0.0865 points.
- The same trend is observed if the household head is divorced/separated (0.0920 points) and if there is an increase in household size (0.0226).
- An increase in age and education of household head, and household income reduces the HHS.
- In particular, increasing household income by 1% reduces the HHS for the HIV/AIDS affected household by 0.102 points.
- Attainment of Graduate/Post-Graduate education level reduces the HHS of the HIV/AIDS affected household by 0.233 points, all things being constant.
- The provincial dummies indicate that in comparison to the base province of Bulawayo, all the other provinces have a high probability for a reduced HHS.

5.7.5 Malnutrition and illness in children 6-59 months

Stunting and household HIV/AIDS status

- HIV/AIDS affected households had more stunted children (27.7%) than those in unaffected households (23.6%).
- HIV/AIDS affected households had more underweight children (9.9%) as compared to unaffected households (8.3%), mean differences are statistically valid at the 1% level of significance.
- Households that are affected by HIV are 4.08% more likely to have children under 5 years who are stunted at the 1% level of significance.
- Increasing the age of household head by 1% reduces the likelihood of stunted children by 0.15% and attainment of Graduate/Post-Graduate qualification reduces the chances of stunted children by 7.68%.
- Living in the rural areas reduces the probability of children being stunted by 4.54%.
- The provincial dummies indicate that in comparison to the base province of Bulawayo, all the other provinces have a high probability for reduced stunted children.

Underweight and household HIV/AIDS status

- Increasing household income reduces the probability of children being underweight by 0.644% while an increase in household size increases the probability of underweight children by 0.687%
- Increasing age of household head by 1% reduces the probability of underweight children by 0.058 at 5% level of significance.

5.7.6 Morbidity in under 5 children

HIV/AIDS status and the incidence of diarrhoeal diseases

- The findings point to statistical homogeneity in the incidences of diarrhoeal diseases before controlling for observed confounding variables.
- After controlling for observed confounders, the results reveal that at 10% level of significance, a child from an HIV/AIDS affected household 1.53% more likely to suffer from diarrhoea.
- An increase in household income and age and education level of household head decreases the likelihood of the incidence of diarrhoea.
- Increasing income of an HIV/AIDS affected household by 1% is likely to reduce the incidence of diarrhoea by 1.21%.
- Attainment of Graduate/Post-Graduate qualification by the household head reduces the incidence of diarrhoea by 7.36% at the 1% level of significance.
- Marital status in all its forms and an increase in household size are likely to increase the incidence of diarrhoea in the HIV/AIDS affected households.

Household HIV/AIDS status and the incidence of cough

- The difference in the incidence of cough between affected and unaffected households is not statistically significant at 1% level of significance.
- However, 29.6% of the children in the HIV/AIDS affected households suffered from cough two weeks prior to the survey while in the unaffected households it was 28.4% of the children.
- After controlling for observed confounders, there is 1.86% more likelihood of a child from an HIV/AIDS affected household to suffer from cough at the 10% level of significance.

- A child from an HIV/AIDS affected household located in the rural areas is 5.415% less likely to suffer from cough, at 1% level of significance, than a child from an affected household located in urban areas.
- An increase in household income, age and education level of household head decreases the likelihood of the incidence of cough.
- For example, an increase in the age of household head by 1% is likely to decrease the incidence of cough by 0.537%, while attainment of a Diploma/Certificate after primary education reduces the incidence of cough in the HIV/AIDS affected households by 12.6% at the 1% level of significance.
- Increasing household size by 1% is likely to increase the incidence of cough by 3.17% at the 1% level of significance.
- The provincial dummies indicate that in comparison to the base province of Bulawayo, living in Manicaland, Mat North, Mat South and Masvingo increase the likelihood of reducing the incidence of cough, while living in Mash West and Midlands increases the probability of the incidence of cough in children under 5 years in the HIV/AIDS affected households.

Household HIV/AIDS status and the incidence of fever

- There is statistical homogeneity in the probability that a child was affected by fever between households affected by HIV versus those that are not affected.to the survey while in the affected urban households it was 19% of the children.
- More so, *there is* no statistically significant difference in the probability of child suffering from fever between HIV/AIDS affected and unaffected households.
- An increase in the age and education level of household head and in household income decreases the likelihood of the incidence of fever at the 1% level of significance.
- For example, an increase in the age of household head by 1% is likely to decrease the incidence of fever by 0.3587%,
- Increasing household income by 1% is likely to reduce the incidence of fever by 1.07%
- A child from an HIV/AIDS affected household located in the rural areas is 2.74% less likely to suffer from fever than a child in urban areas.
- Increasing household size by 1% is likely to increase the incidence of fever by 2.31% at the 1% level of significance.

- The provincial dummies indicate that in comparison to the base province of Harare, living in Midlands Province has an increased likelihood of increasing the incidence of fever at the 1% level of significance.

5.7.7 Child nutrition and HIV status

Household HIV/AIDS status and children ever breastfed

- The results reveal no statistically significant difference in the average number of under 5 children that were ever breastfed between the HIV/AIDS affected households and those that are not affected before controlling for observed confounding variables.
- After controlling for confounding variables, there is no statistically significant difference in the average number of children that were ever breastfed between households that are affected by HIV/AIDS and those that are not affected.
- Increasing the age and education of the household head and of household income, reduces the likelihood that children under 5 years are breastfed, at the 1% level of significance
- Marital status, in its all forms, increases the probability of children under 5 years being breastfed at the 1% level of significance

Breastfeeding advice by household HIV/AIDS status

- The difference in the percentage of HIV/AIDS affected and unaffected households that received breastfeeding advice is not statistically significant at 1% level of significance.
- The results show that 21.8% of the affected households received advice on breastfeeding while 21.9% of unaffected households also received the advice.
- Increasing the age and education level of household head and household income reduces the likelihood of getting advice on breastfeeding, at the 1% level of significance.
- Marital status, in its all forms, and increasing household size increases the probability of an HIV/AIDS affected household getting advice on breastfeeding at the 1% level of significance.

5.7.8 WASH and HIV/AIDS status

In summary, the findings in the table show no statistically significant difference in the WASH of the affected versus unaffected households before controlling for observed covariates.

Access to improved water facilities by household HIV/AIDS status

- The difference in access to improved water sources between HIV/AIDS affected households versus the unaffected households is not statistically valid at the 1% level of significance.
- The results show that 78.8% of the HIV/AIDS affected households had access to improved water sources versus the 81.7% of the unaffected households.
- A female headed household, an increase in age and education of the household head and an increase in household income increase the likelihood of HIV/AIDS affected household to access improved water facilities.
- For example, a female headed household has a 3.03% increased probability of accessing improved water facilities.
- Increasing household income by 1% increases the probability of the household accessing improved water facilities by 10.2% at the 1% level of significance.
- HIV/AIDS affected households that are members of the Apostolic Sect have a 3.16% reduced probability of accessing improved water facilities.
- HIV/AIDS affected households in the rural areas have a 17.5% reduced probability of accessing improved water facilities.
- The provincial dummies indicate that affected households located in Manicaland and Matabeleland South have reduced access while those located in Mashonaland East, Bulawayo and Matabeleland North have an increased probability of accessing improved water facilities at the 1% level of significance.

Household HIV/AIDS status and open defecation

- The results show that 24.0% of the affected households practiced open defecation whilst for unaffected household its 17.5%.
- A female-headed household, increasing age and education of the household head, increasing household income and attaining a higher educational qualification reduce the likelihood of HIV/AIDS affected households practicing open defecation.

- In particular, a female headed household has a 2.49% reduced likelihood of practicing open defecation and attainment of Graduate/Post-Graduate qualification by the household head increases the probability of the household not practicing open defecation by 7.78%
- Households located in the rural areas are 24.9% more likely to practice open defecation at 1% level of significance as compared to their urban counterparts, *ceteris paribus*.
- HIV/AIDS affected households that are members of the Apostolic Sect, Zion and those that practice traditional religion have a higher probability of practicing open defecation.
- The provincial dummies indicate that HIV/AIDS affected households located in Bulawayo, Mashonaland West, Matabeleland North, Matabeleland South and Midlands have an increased probability at the 1% level of significance to practice open defecation while those located in Manicaland, Mashonaland Central and Mashonaland East have a reduced probability.

Access to hand washing station by household HIV/AIDS status

- The results indicate that 22.5% of the affected households had access to a hand washing stations whist 31.7% of the unaffected did not have access.
- Households with an HIV/AIDS positive member have a reduced probability of accessing a hand washing station by 7.46% at the 1% level of significance.
- HIV/AIDS affected households located in the rural areas have a 17.1% reduced likelihood of accessing hand washing stations as compared to their urban counterparts.
- The probability of HIV/AIDS affected households accessing hand washing stations increase as the age and education of household head increases, when household head is female, when household size and income increase.
- HIV/AIDS affected households that are members of the Apostolic Sect and Zion have a reduced probability of accessing a hand washing station than those households not members of these two religious groups.

5.8 Recommendations for further research

i. For more conclusive results, there is need to identify the HIV positive individual as this will give more insights into the impact of HIV/AIDS on child nutrition. This can

help answer the lack of statistically significant difference between breastfeeding and non-breastfeeding women in HIV/AIDS affected and unaffected households.

CHAPTER 6

Food Security

6.1 Food security and HIV/AIDS status

HIV/AIDS and food insecurity are two of the leading causes of morbidity and mortality in sub-Saharan Africa, with each heightening the vulnerability to, and worsening the severity of, the other[25]. Disentangling the relationship between HIV/AIDS and food insecurity is complex, as the relationship is multifaceted and bidirectional[26]. Evidence suggests that the impact of HIV/AIDS on food security is directly related to the wealth of the household[27]. Spending on food in poor households falls significantly following the death of an economically productive adult. HIV/AIDS poses a direct threat to household food security as it affects the most productive household members. When a person is sick the household not only has to manage without their labour inputs but with the loss of labour from those who have to care for the sick.

The quantity and quality of food available to a household will decline as productive family members become sick or die. The additional burden of caring for orphans and unproductive individuals can impact upon overall food security. This has resulted in households becoming increasingly dependent upon off-farm sources, in particular cash income or remittances from migrant labour, whether to buy farm inputs or pay school fees. These structural forces forge dynamic links between rural and urban areas, increasing their interdependence and serving as a channel for the flow of cash, people and as a route for all infectious disease, including the transmission of HIV[28].

[25] Tsai et al. (2011). The social context of food insecurity among persons living with HIV/AIDS in rural Uganda. *Social science & medicine (1982)*, *73*(12), 1717–1724.
[26] Frega, R., Duffy, F., Rawat, R., & Grede, N. (2010). Food Insecurity in the Context of HIV/AIDS: A Framework for a New Era of Programming. Food and Nutrition Bulletin, 31(4_suppl4), S292–S312
[27] Hawkins and Husseun (2002). Impact of HIV/AIDS on Food Security. *ODI Food Security Briefings*
[28] FAO (2003) Mitigating the Impact of HIV/AIDS on Food Security and Rural Poverty

6.1.1 Household food insecurity status

Table 43. shows the disaggregation of food insecurity status by household HIV/AIDS status. Nationally, 62.1% of the surveyed households were food insecure, 76.2% of HIV/AIDS affected households were food insecure and for the unaffected households it was 59.9%. The affected versus unaffected difference of 16.4% is statistically valid at the 1% level of significance.

Table 43. Household food insecurity by Household HIV/AIDS status

National		HIV/AIDS Status		Difference
		Yes [Y]	No [N]	
Mean	0.621	0.762	0.599	0.164***
S. D	0.485	0.426	0.490	
Min	0	0	0	
Max	1	1	1	

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

6.1.2 Correlates of household characteristics and food insecurity

Table 44 shows that after controlling for confounding variables, the results in Column (I) indicate that at the 1% level of significance, households with PLWHIV had a 2.62% increased likelihood of being food insecure than their unaffected counterparts. The result therefore augurs with earlier studies that note that HIV/AIDS increases food insecurity status of the household[29].

In addition, being married and living apart and being divorced/separated increases the probability of the households being food insecure by 4.99% and 4.03% respectively. Results in Column (I) of Table 44 further indicate that at the 1% level of significance, an increase in household size increases the likelihood of the household being food insure by 3.07% while being located in the rural areas increases the likelihood of being food insecure by 41%.

Column (I) shows that an increase in educational level of household head from A' Level up to Graduate/Post-Graduate is associated with a statistically significant decrease (at the 1% level of significance) in food insecurity, *ceteris paribus*. For example, attaining A' Level is likely to reduce food insecurity by 4.33% and by 4.40%

[29]Tsai et al. (2011). The social context of food insecurity among persons living with HIV/AIDS in rural Uganda. *Social science & medicine (1982)*, *73*(12), 1717–1724

when one attains Graduate and Post-Graduate level. Furthermore, the results in Column (I) indicate that increasing household income by 1% decreases the probability of the household being food insecure by 11.6% at the 1% level of significance.

The provincial dummies reveal that at the 1% level of significance in comparison to the base province of Harare, households located in Bulawayo, Manicaland, Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces have an increased probability of being food insecure by 8.49%, 10.8%, 9.02%, 6.10%,12.3%, 15.3%, 7.92% and 7.99% respectively.

Table 44. Correlates of household characteristics and food insecurity

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household affected	0.0262***	0.162***	0.256***
	(0.00697)	(0.0391)	(0.0665)
Household head is female	-0.00477	-0.0163	-0.0110
	(0.00698)	(0.0320)	(0.0546)
Household head age	-0.000477**	-0.00218**	-0.00413**
	(0.000198)	(0.00110)	(0.00198)
Married living together	0.00565	0.0357	0.0985
	(0.0125)	(0.0591)	(0.102)
Married living apart	0.0499***	0.238***	0.426***
	(0.0143)	(0.0699)	(0.120)
Divorced/separated	0.0403***	0.216***	0.332***
	(0.0147)	(0.0699)	(0.121)
Widow/widower	0.0348**	0.228***	0.379***
	(0.0143)	(0.0732)	(0.128)
Primary level	-0.00139	-0.0260	-0.0157
	(0.00854)	(0.0580)	(0.107)
ZJC level	-0.000369	-0.0507	-0.0708
	(0.0106)	(0.0639)	(0.115)
O' level	-0.0232**	-0.100*	-0.121
	(0.00985)	(0.0591)	(0.108)
A' level	-0.0433***	-0.124	-0.110
	(0.0161)	(0.0828)	(0.148)
Diploma/Certificate after primary	-0.0611**	-0.219	-0.286
	(0.0282)	(0.165)	(0.315)
Diploma/Certificate after secondary	-0.0559***	-0.214***	-0.233
	(0.0149)	(0.0817)	(0.145)
Graduate/Post-Graduate	-0.0440***	-0.122	-0.00750
	(0.0163)	(0.0921)	(0.166)
Protestant	-0.0130	-0.0337	-0.0533
	(0.0107)	(0.0553)	(0.0971)
Pentecostal	0.00369	0.0275	0.0509
	(0.00935)	(0.0472)	(0.0824)
Apostolic Sect	0.00689	0.0246	0.0316
	(0.00909)	(0.0481)	(0.0844)

Zion	0.00172	0.0299	0.0592
	(0.0110)	(0.0634)	(0.111)
Other Christian	0.0229**	0.118*	0.207*
	(0.0116)	(0.0617)	(0.107)
Islam	0.0121	0.1000	0.0795
	(0.0266)	(0.118)	(0.206)
Traditional	-0.0321	-0.208*	-0.452*
	(0.0198)	(0.117)	(0.231)
Other religion	-0.00518	-0.0649	-0.131
	(0.0205)	(0.108)	(0.192)
No religion	0.0139	0.0577	0.109
	(0.0108)	(0.0575)	(0.102)
N/a	-0.0112	-0.0530	-0.0744
	(0.0166)	(0.0845)	(0.144)
Household size	0.0307***	0.154***	0.319***
	(0.00223)	(0.0131)	(0.0210)
ln (Household income)	-0.116***	-0.581***	-1.213***
	(0.00235)	(0.0169)	(0.0351)
Household has mentally ill member	-0.0148**	-0.0339	-0.0504
	(0.00595)	(0.0521)	(0.115)
Household members with alive mother	0.00164	0.0597**	0.108***
	(0.00368)	(0.0254)	(0.0411)
Household members with alive father	-0.00127	-0.0376	-0.0768**
	(0.00330)	(0.0241)	(0.0383)
Household is located in rural area	0.410***	1.281***	2.308***
	(0.00863)	(0.0340)	(0.0664)
Bulawayo	0.0849***	0.352***	0.653***
	(0.0174)	(0.0633)	(0.106)
Manicaland	0.108***	0.475***	0.863***
	(0.0115)	(0.0525)	(0.0872)
Mash Central	-0.00719	-0.213***	-0.431***
	(0.0128)	(0.0630)	(0.131)
Mash East	0.0902***	0.356***	0.657***
	(0.0108)	(0.0494)	(0.0843)
Mash West	0.0610***	0.176***	0.415***
	(0.0109)	(0.0477)	(0.0823)
Mat North	0.123***	0.678***	1.111***
	(0.0112)	(0.0527)	(0.0902)
Mat South	0.153***	0.768***	1.345***
	(0.0105)	(0.0477)	(0.0832)
Midlands	0.0792***	0.376***	0.635***
	(0.0104)	(0.0446)	(0.0758)
Masvingo	0.0799***	0.384***	0.679***
	(0.0113)	(0.0518)	(0.0902)
Constant	0.804***	1.875***	4.234***
	(0.0250)	(0.133)	(0.252)
Observations	19,184	19,184	19,184
R-squared	0.550		

Robust standard errors in parentheses

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

6.2 Coping with Shocks and Stressors

6.2.1 Shocks and stressors in urban areas

Table 45 shows the disaggregation in the ability of the urban households to cope with shocks and stressors. The results reveal a statistically significant difference, at the 1% level of significance, in the mean differences of ability of HIV/AIDS affected and unaffected households to cope to the following shocks and stressors; price increases (1.8%), rental increases (4.1%), diarrhoeal diseases (2.8%) and health related (2.2%).

Table 45. Ability to cope with shocks and stressors in by household HIV/AIDS urban areas

Shocks and stressors	National		Yes [Y]		No [N]		Difference in means
	Mean	S. D	Mean	S. D	Mean	S. D	[Y-N]
Price increases	0.953	0.211	0.969	0.172	0.952	0.215	0.018***
Price drops	0.322	0.467	0.306	0.461	0.323	0.468	-0.018
Transport costs	0.835	0.371	0.830	0.375	0.836	0.371	-0.005
Rental increases	0.355	0.478	0.318	0.466	0.359	0.480	-0.041***
Cash shortage	0.811	0.391	0.813	0.390	0.811	0.391	0.002
Fiscal policy	0.539	0.499	0.526	0.500	0.540	0.498	-0.014
Loss employment	0.062	0.241	0.074	0.261	0.061	0.239	0.013
Death breadwinner	0.023	0.151	0.034	0.180	0.022	0.147	0.011*
Theft burglary	0.065	0.247	0.063	0.243	0.065	0.247	-0.002
Agric related	0.018	0.133	0.014	0.119	0.018	0.135	-0.004
Diarrhoeal diseases	0.054	0.226	0.080	0.271	0.051	0.221	0.028***
Health related	0.025	0.156	0.045	0.207	0.023	0.149	0.022***
Weather related	0.011	0.104	0.011	0.107	0.011	0.103	0.001
drought	0.163	0.369	0.181	0.385	0.161	0.367	0.020
Petty trade	0.056	0.230	0.060	0.238	0.055	0.229	0.005
demolitions	0.007	0.085	0.008	0.087	0.007	0.085	0.000
Urban agric	0.013	0.112	0.014	0.119	0.013	0.111	0.002
Veld fires	0.004	0.063	0.003	0.054	0.004	0.064	-0.001
Human wildlife	0.015	0.123	0.017	0.130	0.015	0.122	0.002
conflict	0.060	0.237	0.057	0.231	0.060	0.237	-0.003

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

6.2.1.1 Price increases

Concerning the ability of the urban households to cope with price increases, Table 46 shows that 96% of the HIV/AIDS affected households indicated the impact of price increases to be severe as compared to 92% of unaffected households that reported the same. The 3.9% difference is statistically significant at the 1% level of significance. Furthermore, the results reveal that 62.8% of the affected households are not able to cope and 37.5% not able to recover from the impact of price increases. As for the unaffected households, 56.9% indicated that they are not able to cope and 36.3% did not recover from the price increases. Regarding the ability to cope with price increases in the future, 76.7% of the affected households reported that they will not be able to cope and 72.9% of the surveyed unaffected households reported the same.

Table 46. Household abilities to cope with price increases

	National		Yes [Y]		No [N]		Difference in means
	Mean	S. D	Mean	S. D	Mean	S. D	
Impact is severe	0.924	0.265	0.960	0.197	0.920	0.271	0.039***
Unable to cope	0.575	0.494	0.628	0.484	0.569	0.495	0.058***
Did not recover	0.364	0.481	0.375	0.485	0.363	0.481	0.012
Unable to cope in future	0.733	0.442	0.767	0.423	0.729	0.444	0.038***

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

Column (I) of Table 47 shows that there is no statistically significant association between household HIV/AIDS status and experiencing the shock of price increases. This is because of the increase in inflation throughout all of the sectors of the economy. Column (II) of the table shows that there is however increased probability that HIV/AIDS affected households 1.7% more likelihood to cite the impact of the price increase shock as severe at the 5% level of significance. Columns (III) to (V) of the table however indicate that there is no statistically significant heterogeneity according to the HIV/AIDS status of the household in the household's ability to cope or recover from the shock of price increases.

Table 47. Determinants of household ability to cope with price increases

	Price increases	Impact is severe	Unable to cope	Did not recover	Unable to cope in future
	(I)	(II)	(III)	(IV)	(V)
Household affected	0.00562	0.0170**	0.0258	0.0112	0.00966
	(0.00622)	(0.00751)	(0.0163)	(0.0263)	(0.0145)
Household head is female	0.0207***	0.0123*	0.0371***	0.0210	0.0160
	(0.00502)	(0.00680)	(0.0119)	(0.0182)	(0.0108)
Household head age	-0.000284	0.000280	0.00172***	0.000119	0.000763*
	(0.000218)	(0.000261)	(0.000470)	(0.000746)	(0.000424)
Married living together	0.00320	0.0321**	0.00797	-0.00868	0.00153
	(0.00944)	(0.0147)	(0.0227)	(0.0312)	(0.0210)
Married living apart	-0.00835	0.0441**	0.0332	0.0116	0.0377
	(0.0123)	(0.0175)	(0.0282)	(0.0415)	(0.0261)
Divorced/separated	-0.00231	0.0399**	0.0284	-0.0185	0.0464*
	(0.0115)	(0.0168)	(0.0277)	(0.0417)	(0.0253)
Widow/widower	0.00306	0.0289*	-0.00438	-0.0518	-0.00276
	(0.0124)	(0.0175)	(0.0295)	(0.0434)	(0.0272)
Primary level	0.0308**	-0.000180	0.0299	0.0614	0.0627**
	(0.0145)	(0.0133)	(0.0286)	(0.0500)	(0.0267)
ZJC level	0.0150	-0.00132	0.00630	-0.0508	0.0246
	(0.0153)	(0.0139)	(0.0299)	(0.0509)	(0.0281)
O' level	0.0238	-0.0183	0.000676	-0.0112	0.0344
	(0.0147)	(0.0134)	(0.0277)	(0.0475)	(0.0262)
A' level	0.00266	-0.0365*	-0.0177	-0.0361	0.0355
	(0.0183)	(0.0192)	(0.0354)	(0.0560)	(0.0330)
Diploma/Certificate after primary	-0.0253	-0.0521	-0.0337	-0.0272	-0.0300
	(0.0348)	(0.0386)	(0.0595)	(0.0818)	(0.0585)
Diploma/Certificate after secondary	0.00493	-0.0487**	-0.0566*	-0.0308	0.00334
	(0.0176)	(0.0190)	(0.0335)	(0.0533)	(0.0320)
Graduate/Post-Graduate	0.0141	-0.0575***	-0.0731**	-0.0329	-0.0123
	(0.0188)	(0.0214)	(0.0367)	(0.0562)	(0.0348)
Protestant	0.0211**	0.0122	0.0283	-0.0854***	0.0329*
	(0.00989)	(0.0125)	(0.0214)	(0.0317)	(0.0198)
Pentecostal	0.0185**	0.00378	-0.000602	-0.0118	0.00787
	(0.00891)	(0.0110)	(0.0186)	(0.0277)	(0.0172)
Apostolic Sect	0.00996	0.00882	0.0351*	-0.00866	0.0341*
	(0.00947)	(0.0110)	(0.0191)	(0.0296)	(0.0175)
Zion	0.0171	0.0214	0.0317	0.0152	0.0502**
	(0.0116)	(0.0142)	(0.0272)	(0.0424)	(0.0244)
Other Christian	-0.00687	0.00439	-0.0202	-0.0765**	0.0177
	(0.0122)	(0.0142)	(0.0240)	(0.0350)	(0.0218)
Islam	0.0111	-0.0296	-0.0169	0.0434	-0.0219
	(0.0250)	(0.0350)	(0.0542)	(0.0795)	(0.0488)
Traditional	0.0743***	0.0334	-0.0285	-0.0869	-0.0820
	(0.00918)	(0.0298)	(0.0575)	(0.0759)	(0.0567)
Other religion	0.0232	0.000593	0.0244	0.0889	0.00853
	(0.0168)	(0.0244)	(0.0423)	(0.0641)	(0.0377)
No religion	0.0375***	0.00645	0.0375	0.0237	0.0334
	(0.00984)	(0.0134)	(0.0231)	(0.0343)	(0.0211)
N/a	0.0466***	0.0396**	0.0188	-0.0709	0.0585**
	(0.0129)	(0.0163)	(0.0326)	(0.0542)	(0.0285)
Household size	0.00603***	0.00722***	0.00708*	-0.000627	0.00955**
	(0.00188)	(0.00227)	(0.00419)	(0.00641)	(0.00384)
ln (Household income)	-0.00580**	-0.0179***	-0.0560***	-0.0275***	-0.0421***
	(0.00236)	(0.00286)	(0.00475)	(0.00688)	(0.00442)
Household members with alive mother	-0.000482	0.000152	0.00814	0.0217	-0.000499
	(0.00419)	(0.00449)	(0.00976)	(0.0162)	(0.00893)

Household members with alive father	-0.00120	-0.00244	-0.0129	-0.00762	-0.00515
	(0.00372)	(0.00399)	(0.00908)	(0.0153)	(0.00826)
Bulawayo	0.0258**	0.00480	-0.255***	-0.334***	-0.349***
	(0.0106)	(0.0142)	(0.0243)	(0.0253)	(0.0238)
Manicaland	0.0437***	0.0634***	0.151***	0.144***	0.0673***
	(0.00796)	(0.00970)	(0.0184)	(0.0431)	(0.0149)
Mash Central	0.00141	0.00101	0.0801***	0.201***	-0.0112
	(0.0115)	(0.0150)	(0.0227)	(0.0432)	(0.0200)
Mash East	-0.00426	0.0240**	-0.0187	-0.125***	-0.144***
	(0.00990)	(0.0111)	(0.0193)	(0.0311)	(0.0178)
Mash West	0.0441***	0.0175*	-0.243***	-0.100***	-0.217***
	(0.00693)	(0.00995)	(0.0167)	(0.0251)	(0.0154)
Mat North	0.0456***	0.0341***	0.123***	0.0581	0.0908***
	(0.00816)	(0.0125)	(0.0211)	(0.0467)	(0.0156)
Mat South	0.0353***	0.0542***	-0.230***	0.164***	-0.0634***
	(0.00901)	(0.0116)	(0.0218)	(0.0310)	(0.0194)
Midlands	0.0185**	0.0331***	-0.0379**	0.0348	-0.0527***
	(0.00795)	(0.00967)	(0.0177)	(0.0296)	(0.0151)
Masvingo	0.0508***	0.0197	-0.0660***	-0.152***	-0.0751***
	(0.00744)	(0.0124)	(0.0215)	(0.0315)	(0.0188)
Constant	0.908***	0.947***	0.860***	0.581***	0.948***
	(0.0253)	(0.0287)	(0.0517)	(0.0803)	(0.0471)
Observations	9,790	9,373	9,370	3,952	9,362
R-squared	0.023	0.023	0.106	0.100	0.085

Robust standard errors in parentheses

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

6.2.1.2 Rental increases

Table 48 shows that there is no statistically significant difference in the household abilities to cope or recover from rental increases before controlling for confounding variables.

Table 48. Household abilities to cope with rental increases

	National		Yes [Y]		No [N]		Difference
	Mean	S. D	Mean	S. D	Mean	S. D	in means
Impact is severe	0.779	0.415	0.811	0.392	0.776	0.417	0.035
Unable to cope	0.550	0.498	0.566	0.496	0.548	0.498	0.018
Did not recover	0.361	0.480	0.444	0.499	0.353	0.478	0.091
Unable to cope in future	0.708	0.455	0.747	0.435	0.705	0.456	0.042

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

Table 49 shows that there is no difference in the probability that the household encountered rental increase shock (Column(I)), severity of impact ((column (II)), or ability to cope after controlling for observed confounders. The findings in Column (IV) however show that after controlling for observed confounders, at the 5% level of

significance, households affected by HIV/AIDS are 8.54% more likely to be unable to recover from rental increases.

Table 49. Determinants of household ability to cope with rental increases

VARIABLES	Rental increases	Impact is severe	Unable to cope	Did not recover	Unable to cope in future
	(I)	(II)	(III)	(IV)	(V)
Household is affected	-0.0146	0.0139	-0.0358	0.0854**	0.00571
	(0.0161)	(0.0237)	(0.0291)	(0.0434)	(0.0260)
Household head is female	-0.0297**	0.0297*	0.0479**	0.0186	-0.00606
	(0.0116)	(0.0175)	(0.0198)	(0.0288)	(0.0184)
Household head age	-0.00515***	0.00194***	0.00463***	0.00113	0.00186**
	(0.000441)	(0.000720)	(0.000867)	(0.00138)	(0.000774)
Married living together	0.121***	-0.0475	-0.0621	0.141**	0.0113
	(0.0217)	(0.0325)	(0.0392)	(0.0556)	(0.0380)
Married living apart	0.0760***	-0.0294	0.0252	0.105	0.0671
	(0.0271)	(0.0408)	(0.0495)	(0.0723)	(0.0460)
Divorced/separated	0.107***	0.0141	-0.00570	0.175**	0.0931**
	(0.0274)	(0.0380)	(0.0468)	(0.0731)	(0.0439)
Widow/widower	0.100***	-0.0212	-0.0625	-0.00109	0.0476
	(0.0281)	(0.0413)	(0.0527)	(0.0823)	(0.0490)
Primary level	0.0526**	0.0276	-0.0328	0.247***	0.0109
	(0.0268)	(0.0545)	(0.0595)	(0.0889)	(0.0511)
ZJC level	0.0394	0.0118	-0.0491	0.0969	-0.0547
	(0.0280)	(0.0559)	(0.0614)	(0.0904)	(0.0535)
O' level	0.0738***	0.0253	-0.0489	0.0958	-0.0478
	(0.0260)	(0.0531)	(0.0570)	(0.0827)	(0.0496)
A' level	0.0243	0.0657	-0.0131	0.0420	-0.0198
	(0.0331)	(0.0607)	(0.0669)	(0.0980)	(0.0598)
Diploma/Certificate after primary	-0.0479	0.0277	-0.163	0.132	-0.172*
	(0.0496)	(0.109)	(0.113)	(0.140)	(0.104)
Diploma/Certificate after secondary	0.0486	0.0188	-0.0840	0.155	-0.0112
	(0.0316)	(0.0607)	(0.0655)	(0.0966)	(0.0588)
Graduate/Post-Graduate	0.00870	0.0394	-0.0784	0.103	-0.113*
	(0.0339)	(0.0642)	(0.0707)	(0.0998)	(0.0641)
Protestant	-0.0234	-0.00179	0.0236	-0.0324	-0.000664
	(0.0201)	(0.0325)	(0.0380)	(0.0522)	(0.0352)
Pentecostal	0.0246	-0.0190	-0.00641	0.0358	-0.0172
	(0.0176)	(0.0270)	(0.0322)	(0.0438)	(0.0290)
Apostolic Sect	0.0318*	0.0207	0.0202	0.00721	-0.0195
	(0.0182)	(0.0271)	(0.0331)	(0.0456)	(0.0300)
Zion	0.0444	0.0587*	0.0132	0.000496	-0.00443
	(0.0270)	(0.0350)	(0.0455)	(0.0624)	(0.0404)
Other Christian	-0.00207	-0.0656*	-0.0339	0.0787	0.0239
	(0.0226)	(0.0366)	(0.0413)	(0.0586)	(0.0359)
Islam	-0.0266	-0.0136	0.0382	-0.0109	0.00552
	(0.0489)	(0.0775)	(0.0732)	(0.139)	(0.0885)
Traditional	-0.0132	-0.0868	-0.217**	0.00548	-0.240**
	(0.0557)	(0.107)	(0.0916)	(0.110)	(0.112)
Other religion	-0.00121	0.000704	0.0359	0.189*	0.0455
	(0.0416)	(0.0603)	(0.0758)	(0.101)	(0.0553)
No religion	0.0216	-0.0348	-0.0131	0.0726	-0.0523

	(0.0224)	(0.0337)	(0.0390)	(0.0530)	(0.0363)
N/a	0.0999***	-0.0196	-0.0380	0.0840	-0.0206
	(0.0333)	(0.0433)	(0.0521)	(0.0773)	(0.0467)
Household size	-0.0218***	0.0211***	0.00500	0.0149	0.0100
	(0.00391)	(0.00626)	(0.00756)	(0.0120)	(0.00695)
ln (Household income)	-0.0110**	-0.0315***	-0.0409***	-0.0299**	-0.0465***
	(0.00449)	(0.00653)	(0.00803)	(0.0117)	(0.00783)
Household members with alive mother	0.0181*	-0.0346**	-0.0141	0.0285	0.00150
	(0.00925)	(0.0152)	(0.0173)	(0.0291)	(0.0156)
Household members with alive father	-0.00232	0.0174	0.00757	-0.0338	-0.00841
	(0.00865)	(0.0143)	(0.0164)	(0.0262)	(0.0144)
Bulawayo	0.151***	-0.0996***	-0.233***	-0.440***	-0.285***
	(0.0238)	(0.0328)	(0.0384)	(0.0487)	(0.0368)
Manicaland	0.0667***	0.0511**	0.0723**	0.0587	0.0427*
	(0.0197)	(0.0249)	(0.0326)	(0.0686)	(0.0253)
Mash Central	0.00297	-0.127***	-0.00761	-0.0437	-0.119***
	(0.0221)	(0.0386)	(0.0411)	(0.0720)	(0.0383)
Mash East	0.0362**	0.00989	-0.0237	-0.246***	-0.150***
	(0.0181)	(0.0255)	(0.0325)	(0.0551)	(0.0298)
Mash West	0.0588***	-0.136***	-0.350***	-0.265***	-0.327***
	(0.0161)	(0.0251)	(0.0274)	(0.0432)	(0.0262)
Mat North	-0.0320	0.0572*	0.134***	0.0635	0.0738**
	(0.0218)	(0.0306)	(0.0378)	(0.0985)	(0.0295)
Mat South	0.0698***	0.0685**	-0.187***	0.133**	-0.00624
	(0.0203)	(0.0279)	(0.0373)	(0.0561)	(0.0313)
Midlands	0.136***	-0.0525**	-0.0303	-0.0711	-0.0573**
	(0.0170)	(0.0236)	(0.0282)	(0.0494)	(0.0241)
Masvingo	0.101***	-0.180***	-0.317***	-0.267***	-0.171***
	(0.0209)	(0.0316)	(0.0340)	(0.0484)	(0.0320)
Constant	0.474***	0.896***	0.820***	0.328**	1.049***
	(0.0474)	(0.0832)	(0.0964)	(0.137)	(0.0876)
Observations	9,788	3,551	3,515	1,559	3,500
R-squared	0.050	0.056	0.126	0.145	0.107

Robust standard errors in parentheses

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

6.2.2 Shocks and stressors in rural areas

Table 50 shows the disaggregation by HIV/AIDS status the ability of rural households to cope with shocks and stressors. At the 1% level of significance, the results reveal a statistically significant difference in mean difference between the ability of affected and unaffected households to cope with the following shocks and stressors; loss of employment (2.1%), death of breadwinner (1.2%), and drought (3.2%).

Table 50. Ability to cope with shocks and stressors in rural areas

	National		Yes [Y]		No [N]		Difference
	Mean	S. D	Mean	S. D	Mean	S. D	in means
Cash shortage	0.818	0.386	0.823	0.382	0.817	0.387	0.006
Loss of employment	0.034	0.182	0.052	0.222	0.031	0.172	0.021***
Death of bread winner	0.027	0.161	0.037	0.188	0.025	0.155	0.012***
Diarrhoeal disease	0.064	0.246	0.071	0.257	0.063	0.243	0.008
Health related death	0.068	0.251	0.077	0.267	0.066	0.248	0.011*
Drought	0.763	0.425	0.789	0.408	0.758	0.428	0.032***
Veld fires	0.044	0.204	0.048	0.213	0.043	0.203	0.005
Human wildlife	0.100	0.300	0.115	0.319	0.097	0.296	0.018**
conflict	0.023	0.150	0.027	0.161	0.022	0.147	0.004

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

6.2.2.1 Loss of employment

The results presented in Table 51 indicate that the difference in the ability of the HIV/AIDS affected and unaffected rural households to cope with loss of employment is not statistically significant before controlling for observed confounding variables.

Table 51. Ability to cope with loss of employment in rural areas

	National		Yes [Y]		No [N]		Difference
	Mean	S. D	Mean	S. D	Mean	S. D	in means
Impact is severe	0.932	0.252	0.940	0.239	0.929	0.257	0.010
Unable to cope	0.607	0.489	0.584	0.495	0.614	0.487	-0.030
Did not recover	0.419	0.495	0.415	0.497	0.420	0.495	-0.005
Unable to cope in future	0.718	0.451	0.733	0.444	0.712	0.453	0.021

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

Consistent with the findings in Table 50, the findings in Table 52 (Column I) indicate that at the 1% level of significance, an HIV/AIDS affected household is 1.88% more likely to have its member lose employment as compared to an unaffected household after controlling for observed confounders. There results in Columns (II) to (V) in line with the findings in Table 51 show that even after controlling for confounding variables, there is no statistically significant difference in the household abilities to cope, or recover from loss of employment.

Table 52. Determinants of the ability of rural households to cope with loss of employment

VARIABLES	Loss of employment	Impact is severe	Unable to cope	Did not recover	Unable to cope in future
	(I)	(II)	(III)	(IV)	(V)
Household if affected	0.0188***	-0.0208	-0.0425	0.0630	-0.0500
	(0.00588)	(0.0352)	(0.0644)	(0.112)	(0.0619)
Household head is female	0.00896	0.133*	-0.0401	-0.105	0.0128
	(0.00598)	(0.0693)	(0.0983)	(0.259)	(0.0871)
Household head age	-0.000113	-0.00114	-0.000286	9.00e-05	0.00138
	(0.000135)	(0.00121)	(0.00239)	(0.00424)	(0.00203)
Married living together	0.0132	0.00998	-0.00265	-0.726***	-0.0178
	(0.0114)	(0.0774)	(0.284)	(0.228)	(0.233)
Married living apart	0.00389	-0.0561	-0.0144	-0.785**	-0.0820
	(0.0123)	(0.0816)	(0.286)	(0.381)	(0.242)
Divorced/separated	0.0135	-0.148	0.179	-0.757**	0.0591
	(0.0134)	(0.0964)	(0.275)	(0.343)	(0.225)
Widow/widower	0.0176	-0.0426	-0.00765	-0.821**	-0.0613
	(0.0129)	(0.0829)	(0.273)	(0.322)	(0.221)
Primary level	0.000780	-0.0304	-0.0535	-0.0545	-0.0165
	(0.00544)	(0.0466)	(0.0916)	(0.159)	(0.0831)
ZJC level	0.00713	-0.0383	0.00988	-0.147	-0.00503
	(0.00703)	(0.0572)	(0.112)	(0.189)	(0.0999)
O' level	0.00757	-0.0214	-0.0625	-0.235	-0.0700
	(0.00646)	(0.0597)	(0.109)	(0.174)	(0.0964)
A' level	0.0201	0.0564	0.0988	-0.733**	0.0445
	(0.0254)	(0.0938)	(0.260)	(0.315)	(0.312)
Diploma/Certificate after primary	0.0366	0.0398	0.450***		-0.00574
	(0.0418)	(0.0556)	(0.139)		(0.323)
Diploma/Certificate after secondary	0.0258	-0.205	-0.359	-0.433**	-0.428
	(0.0252)	(0.231)	(0.304)	(0.209)	(0.311)
Graduate/Post-Graduate	-0.0218***				
	(0.00676)				
Protestant	0.00781	-0.0560	0.0836	0.135	0.164
	(0.00951)	(0.0870)	(0.132)	(0.239)	(0.128)
Pentecostal	-0.00628	0.0210	-0.0284	0.293	0.00381
	(0.00758)	(0.0585)	(0.129)	(0.246)	(0.127)
Apostolic Sect	0.00345	-0.00393	0.0462	0.0649	0.235**
	(0.00687)	(0.0506)	(0.103)	(0.210)	(0.0971)
Zion	-0.00170	0.00183	-0.188	0.0973	0.0983
	(0.00802)	(0.0687)	(0.123)	(0.224)	(0.130)
Other Christian	0.00687	-0.00392	0.0382	0.00922	0.206*
	(0.00918)	(0.0661)	(0.125)	(0.279)	(0.115)
Islam	-0.0130	0.0278	0.532***		0.262*

	(0.0182)	(0.0838)	(0.184)		(0.154)
Traditional	0.00908	0.0900	-0.00592	0.228	-0.0330
	(0.0123)	(0.0609)	(0.165)	(0.317)	(0.159)
Other religion	0.0102	0.0667	0.0672	-0.221	0.245
	(0.0156)	(0.0583)	(0.196)	(0.307)	(0.170)
No religion	0.00756	0.0533	0.188	-0.212	0.157
	(0.00789)	(0.0686)	(0.117)	(0.251)	(0.112)
N/a	-0.0150	0.0958	-0.108	-0.370	-0.313
	(0.0100)	(0.0623)	(0.467)	(0.290)	(0.271)
Household size	-0.000426	-0.00917	-0.0382	-0.0163	-0.00266
	(0.00173)	(0.0143)	(0.0247)	(0.0370)	(0.0253)
ln (Household income)	-0.000802	-0.0127	-0.0756***	-0.0496	-0.0662***
	(0.00155)	(0.0139)	(0.0244)	(0.0509)	(0.0232)
Household has mentally ill member	0.00313	0.0446*	0.0766	-0.121	0.0203
	(0.00334)	(0.0264)	(0.0678)	(0.120)	(0.0601)
Household members with alive mother	-0.000294	0.00196	0.0439	0.00487	0.0309
	(0.00276)	(0.0193)	(0.0368)	(0.0742)	(0.0311)
Household members with alive father	-0.00169	0.00708	-0.00556	-0.0204	-0.0195
	(0.00238)	(0.0175)	(0.0329)	(0.0653)	(0.0285)
Manicaland	0.00111	-0.110		0.268	
	(0.00745)	(0.0731)		(0.191)	
Mash Central	0.00340	-0.0407	0.243**		0.187
	(0.00740)	(0.0598)	(0.121)		(0.114)
Mash East	0.000832	-0.0255	0.271**	0.193	0.161
	(0.00691)	(0.0571)	(0.120)	(0.229)	(0.109)
Mash West	0.00869	-0.0333	0.106	0.364	0.304***
	(0.00747)	(0.0545)	(0.130)	(0.235)	(0.106)
Mat South	0.00384	-0.0278	0.0214	0.156	0.0603
	(0.00724)	(0.0500)	(0.129)	(0.230)	(0.124)
Midlands	-0.00203	-0.0991	0.0232	0.133	0.198*
	(0.00701)	(0.0793)	(0.136)	(0.229)	(0.116)
Masvingo	0.0119	-0.0672	0.0878	-0.0671	0.00923
	(0.00778)	(0.0597)	(0.121)	(0.210)	(0.117)
Constant	0.0166	1.097***	0.928***	1.473***	0.722**
	(0.0173)	(0.130)	(0.347)	(0.525)	(0.294)
Observations	9,361	318	310	133	313
R-squared	0.006	0.090	0.159	0.206	0.154

Robust standard errors in parentheses

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

6.2.2.2 Death of breadwinner

The results presented in Table 53 indicate that the difference in the ability of the HIV/AIDS affected and unaffected rural households to cope with the death of breadwinner is statistically insignificant before controlling for observed variables.

Table 53. Ability to cope with death of breadwinner

Death of breadwinner	National		Yes [Y]		No [N]		Difference in means
	Mean	S. D	Mean	S. D	Mean	S. D	
Impact is severe	0.945	0.228	0.962	0.194	0.940	0.237	0.021
Unable to cope	0.560	0.497	0.597	0.494	0.550	0.498	0.048
Did not recover	0.338	0.474	0.323	0.475	0.341	0.476	-0.019
Unable to cope in future	0.725	0.447	0.727	0.448	0.725	0.448	0.003

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

Table 54 (Column III) indicates that at the 1% level of significance, an HIV/AIDS affected household has a 29.4% increased inability to recover from the death of the breadwinner. Column (III) shows that households that are members of the Islam religion have a 50.3% increased likelihood of not being able to recover from the death of the breadwinners as compared to households that are members of other religions. Furthermore, Column (III) reveals that at the 1% level of significance, increasing household income by 1% reduces the probability of the HIV/AIDS households to be unable to recover from the death of a breadwinner by 8.83%.

Table 54. Determinants of the ability of rural households to cope with death of breadwinner

VARIABLES	Death breadwinner	Impact is severe	Unable to cope	Did not recover	Unable to cope in future
	(I)	(II)	(III)	(IV)	(V)
Household is HIV positive	0.000164	0.0135	0.0931	0.294***	-0.00910
	(0.00522)	(0.0395)	(0.0744)	(0.106)	(0.0693)
Household head is female	0.00558	0.0498	-0.0384	-0.320*	-0.0394
	(0.00593)	(0.0546)	(0.104)	(0.162)	(0.0848)
Household head age	-0.000167	9.91e-05	-0.00120	0.00514	-0.000921
	(0.000135)	(0.00129)	(0.00223)	(0.00369)	(0.00196)
Married living together	-0.0271*	0.176	0.221	-0.350	0.144
	(0.0142)	(0.147)	(0.186)	(0.274)	(0.208)
Married living apart	-0.0219	0.171	0.339	0.280	0.188
	(0.0144)	(0.142)	(0.217)	(0.332)	(0.240)
Divorced/separated	-0.0152	0.145	0.0631	-0.0254	0.142
	(0.0154)	(0.139)	(0.210)	(0.315)	(0.221)
Widow/widower	0.0458***	0.133	0.173	-0.129	0.176
	(0.0157)	(0.122)	(0.176)	(0.302)	(0.212)
Primary level	0.00756	-0.0486**	-0.163**	-0.148	-0.174***
	(0.00618)	(0.0228)	(0.0707)	(0.148)	(0.0595)
ZJC level	0.00721	-0.119*	-0.317***	-0.249	-0.139
	(0.00699)	(0.0630)	(0.112)	(0.170)	(0.101)
O' level	0.0103	-0.100*	-0.105	-0.232	-0.221**
	(0.00657)	(0.0512)	(0.101)	(0.150)	(0.0893)
A' level	-0.00499				
	(0.00642)				
Diploma/Certificate after primary	0.0103	0.00490	0.852***		-0.403***
	(0.0290)	(0.0471)	(0.127)		(0.110)
Diploma/Certificate after secondary	0.00264	0.0658	-0.824***	-0.159	-1.119***
	(0.0136)	(0.0990)	(0.210)	(0.297)	(0.171)
Graduate/Post-Graduate	-0.00441				
	(0.00770)				
Protestant	-0.000314	-0.122	0.289**	0.412**	0.201*
	(0.00962)	(0.0770)	(0.138)	(0.185)	(0.112)
Pentecostal	-0.00264	-0.0814	0.113	0.175	0.00570
	(0.00820)	(0.0667)	(0.129)	(0.156)	(0.125)
Apostolic Sect	0.00228	-0.0603	0.193*	-0.0656	0.0403
	(0.00731)	(0.0405)	(0.104)	(0.135)	(0.0897)
Zion	0.000415	-0.0128	0.126	-0.137	-0.120
	(0.00840)	(0.0476)	(0.128)	(0.143)	(0.106)
Other Christian	0.00577	-0.0624	-0.00982	-0.245	-0.0536
	(0.00958)	(0.0721)	(0.130)	(0.155)	(0.123)
Islam	0.0365	-0.0136	0.503***		0.220*
	(0.0323)	(0.0569)	(0.154)		(0.129)
Traditional	-0.00691	0.00869	0.305	-0.248	0.247**
	(0.00963)	(0.0483)	(0.238)	(0.219)	(0.110)
Other religion	-0.00125	0.0203	-0.0631	-0.305**	0.0285
	(0.0138)	(0.0528)	(0.267)	(0.153)	(0.154)
No religion	-0.00398	-0.0599	0.290**	-0.444**	0.0884
	(0.00732)	(0.0605)	(0.137)	(0.200)	(0.107)
N/a	-0.0194***				
	(0.00687)				
Household size	0.000186	0.00743	0.0367	0.0239	0.0201
	(0.00164)	(0.0146)	(0.0251)	(0.0346)	(0.0219)
ln (Household income)	-0.000545	-0.0109	-0.0883***	-0.0872**	-0.0672***

	(0.00145)	(0.0140)	(0.0248)	(0.0393)	(0.0222)
Household has mentally ill member	0.000274	-0.105*	-0.0347	-0.102	-0.0264
	(0.00292)	(0.0559)	(0.0735)	(0.0786)	(0.0704)
Household members with alive mother	0.0121***	-0.000784	-0.0264	-0.0311	-0.00769
	(0.00364)	(0.0146)	(0.0329)	(0.0568)	(0.0253)
Household members with alive father	-0.0180***	-0.00931	-0.00965	-0.0391	-0.0241
	(0.00333)	(0.0131)	(0.0285)	(0.0528)	(0.0227)
Manicaland	0.00705	-0.102	-0.223	-0.0546	-0.139
	(0.00617)	(0.0701)	(0.153)	(0.243)	(0.130)
Mash Central	0.0334***	-0.0430	-0.164	-0.478*	-0.164
	(0.00718)	(0.0377)	(0.131)	(0.243)	(0.103)
Mash East	0.0157***	-0.0795*	-0.0108	-0.0518	-0.0787
	(0.00597)	(0.0477)	(0.131)	(0.247)	(0.104)
Mash West	0.0139**	-0.0335	-0.127	-0.213	-0.00755
	(0.00588)	(0.0358)	(0.137)	(0.267)	(0.101)
Mat North	-	-	-		-
Mat South	0.00152	-0.0135	0.0131		-0.0804
	(0.00608)	(0.0344)	(0.134)		(0.106)
Midlands	0.0219***	-0.00676	-0.253*	-0.354	-0.00109
	(0.00673)	(0.0400)	(0.139)	(0.238)	(0.110)
Masvingo	0.0262***	-0.0963*	-0.361***	-0.362	-0.458***
	(0.00713)	(0.0554)	(0.132)	(0.238)	(0.109)
Constant	0.0319	0.956***	0.917***	1.209***	1.146***
	(0.0197)	(0.151)	(0.267)	(0.381)	(0.256)
Observations	9,361	282	275	123	277
R-squared	0.055	0.143	0.237	0.454	0.267

Robust standard errors in parentheses

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

6.2.2.3 Drought

The results presented in Table 55 indicate a statistically significant difference in the severity of the impact of drought between HIV/AIDS affected and unaffected households. The results show that 90.7% of the HIV/AIDS affected households cited the impact of drought as severe versus 87.6% of the unaffected households.

Table 55. Ability to cope with drought

	National		Yes [Y]		No [N]		Difference
	Mean	S. D	Mean	S. D	Mean	S. D	
Impact is severe	0.882	0.323	0.907	0.290	0.876	0.329	0.031***
Unable to cope	0.561	0.496	0.545	0.498	0.564	0.496	-0.019
Did not recover	0.376	0.485	0.391	0.488	0.373	0.484	0.017
Unable to cope in future	0.674	0.469	0.682	0.466	0.672	0.469	0.009

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

The results displayed in Table 56 reveal no association between household HIV status and the impact of drought on rural households. However, Column III shows that increasing the education level of household head from Primary up to O' Level increases the ability of the household to cope with drought at the 1% level of significance. More so, Columns (II), (III) and (IV) indicate that at the 1% level of significance, an increase in household income reduces the severity of drought by 3%, it also reduces the inability to cope and inability to recover from drought by 4.69% and 2.95% respectively. Results in Column (II) show that at 1% level of significance, the severity of drought is increased by 5.8% and 8.17% for members of the Apostolic Sect and those that practice Traditional religion respectively. The results (Column IV) also show that an increase in the age of household head by 1% reduced the inability of the household to recover from drought by 0.178%.

Table 56. Determinants of the ability of rural households to cope with drought

VARIABLES	Drought	Impact is severe	Unable to cope	Did not recover	Unable to cope in future
	(I)	(II)	(III)	(IV)	(IV)
Household is affected	-0.00963	0.0176*	-0.00637	0.0312	0.00946
	(0.0118)	(0.00949)	(0.0156)	(0.0224)	(0.0144)
Household head is female	0.0106	-0.00521	0.0323	0.0227	0.00566
	(0.0164)	(0.0142)	(0.0212)	(0.0286)	(0.0201)
Household head age	0.00150***	-0.000211	-0.000678	-0.00178***	-0.000715*
	(0.000336)	(0.000291)	(0.000446)	(0.000614)	(0.000414)
Married living together	0.0521	0.0154	0.0543	0.0812	0.0813*
	(0.0337)	(0.0306)	(0.0438)	(0.0558)	(0.0429)
Married living apart	0.0162	0.0271	0.0832*	0.0313	0.101**
	(0.0360)	(0.0335)	(0.0466)	(0.0605)	(0.0457)
Divorced/separated	0.00759	0.0281	0.0372	0.0384	0.0476
	(0.0367)	(0.0332)	(0.0475)	(0.0635)	(0.0465)
Widow/widower	0.0673*	0.0104	0.00382	0.0487	0.0544
	(0.0345)	(0.0321)	(0.0451)	(0.0586)	(0.0442)
Primary level	0.00932	-0.0354***	-0.0779***	-0.0356	-0.0696***
	(0.0128)	(0.0102)	(0.0168)	(0.0245)	(0.0156)
ZJC level	0.00630	-0.0447***	-0.0769***	-0.0519*	-0.0584***
	(0.0166)	(0.0140)	(0.0217)	(0.0307)	(0.0203)
O' level	-0.00856	-0.0534***	-0.0790***	-0.0745**	-0.0603***
	(0.0157)	(0.0129)	(0.0203)	(0.0293)	(0.0190)
A' level	-0.111*	-0.0988	-0.0820	-0.107	-0.0534
	(0.0620)	(0.0660)	(0.0774)	(0.109)	(0.0738)
Diploma/Certificate after primary	-0.0923	-0.0462	-0.0476	-0.0271	-0.147
	(0.0790)	(0.0806)	(0.105)	(0.115)	(0.101)
Diploma/Certificate after secondary	-0.0965*	-0.0829	-0.0438	-0.0690	-0.128*
	(0.0535)	(0.0609)	(0.0765)	(0.0939)	(0.0741)
Graduate/Post-Graduate	-0.0855	0.104**	0.0584	0.0154	0.0120
	(0.0759)	(0.0458)	(0.101)	(0.143)	(0.0970)
Protestant	-0.000177	0.0217	-0.00772	0.0415	0.00271
	(0.0216)	(0.0216)	(0.0291)	(0.0378)	(0.0275)
Pentecostal	-0.00412	0.0318*	0.0192	0.118***	0.0425*
	(0.0200)	(0.0194)	(0.0264)	(0.0358)	(0.0251)
Apostolic Sect	0.0268	0.0580***	0.0530**	0.0629**	0.0351
	(0.0170)	(0.0164)	(0.0225)	(0.0299)	(0.0215)
Zion	0.0202	0.0417**	0.00849	0.0441	-0.000247
	(0.0199)	(0.0190)	(0.0266)	(0.0346)	(0.0256)
Other Christian	0.0309	0.0445**	0.0871***	0.0555	0.0681**
	(0.0211)	(0.0199)	(0.0284)	(0.0393)	(0.0268)
Islam	0.0159	0.0546	-0.0692	0.227**	0.0782
	(0.0592)	(0.0502)	(0.0775)	(0.113)	(0.0733)
Traditional	0.117***	0.0817***	0.0718**	0.210***	0.106***
	(0.0249)	(0.0214)	(0.0347)	(0.0545)	(0.0316)
Other religion	-0.0831**	0.0743**	0.0887*	-0.102	0.0273
	(0.0376)	(0.0306)	(0.0480)	(0.0666)	(0.0480)
No religion	-0.0204	0.0570***	0.0721***	0.0907**	0.0681***

	(0.0196)	(0.0181)	(0.0259)	(0.0358)	(0.0246)
N/a	-0.0269	0.0456	0.0963**	-0.00926	0.0651
	(0.0368)	(0.0317)	(0.0475)	(0.0676)	(0.0447)
Household size	0.0105***	-0.000441	-0.0100**	0.00795	-0.00600
	(0.00363)	(0.00331)	(0.00505)	(0.00697)	(0.00470)
ln (Household income)	-0.0432***	-0.0300***	-0.0469***	-0.0295***	-0.0449***
	(0.00390)	(0.00353)	(0.00502)	(0.00717)	(0.00475)
Household has mentally ill member	0.000878	0.00299	0.0292***	-0.0183	0.0198*
	(0.00851)	(0.00750)	(0.0113)	(0.0159)	(0.0106)
Household members with alive mother	0.00855	0.00848*	0.0221***	-0.00393	0.0165**
	(0.00580)	(0.00509)	(0.00803)	(0.0114)	(0.00758)
Household members with alive father	0.00132	0.000414	-0.00905	-0.00220	-0.00902
	(0.00508)	(0.00446)	(0.00705)	(0.0101)	(0.00656)
Mash Central	-0.0136	0.0729***	-0.00278	-0.143***	0.0116
	(0.0191)	(0.0177)	(0.0256)	(0.0375)	(0.0250)
Mash East	-0.0516***	0.0559***	0.135***	-0.0671*	0.129***
	(0.0181)	(0.0177)	(0.0238)	(0.0386)	(0.0231)
Mash West	-0.0303	0.0575***	0.0972***	-0.00395	0.169***
	(0.0189)	(0.0180)	(0.0249)	(0.0404)	(0.0233)
Mat North	0.0365*	0.140***	0.147***		0.166***
	(0.0189)	(0.0158)	(0.0246)		(0.0234)
Mat South	0.140***	0.0856***	-0.115***	0.0336	0.00240
	(0.0178)	(0.0176)	(0.0245)	(0.0359)	(0.0243)
Midlands	0.0675***	0.0646***	0.0693***	0.166***	0.213***
	(0.0179)	(0.0176)	(0.0245)	(0.0388)	(0.0223)
Masvingo	-0.0526***			-0.143***	
	(0.0196)			(0.0371)	
Constant	0.726***	0.914***	0.742***	0.467***	0.772***
	(0.0466)	(0.0416)	(0.0603)	(0.0819)	(0.0586)
Observations	9,360	7,076	7,059	3,465	7,053
R-squared	0.059	0.037	0.059	0.081	0.057

Robust standard errors in parentheses

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

6.3 Chapter Summary

6.3.1 Food insecurity status of HIV/AIDS affected households

- Nationally, 62.1% of the surveyed households were food insecure.
- The disaggregation by the household HIV/AIDS status show that 76.2% of affected households were food insecure and whilst for the unaffected households it was 59.9%.
- The affected versus unaffected difference of 16.4% in the proportion of households affected by HIV/AIDS and that were food insecure at the time of the survey is statistically valid at the 1% level of significance.

6.3.2 Household characteristics and food insecurity

- At the 1% level of significance, households with an HIV/AIDS positive member have a 2.62% increased likelihood of being food insecure than their unaffected counterparts.
- The result therefore augurs with earlier studies that note that HIV/AIDS increases food insecurity status of the household
- Being married and living apart and being divorced/separated increases the probability of the households being food insecure by 4.99% and 4.03% respectively.
- Increasing household size increases the likelihood of the household being food insure by 3.07%.
- Living in the rural areas increases the likelihood of being food insecure by 41%.
- In education level of household head from A' Level up to Graduate/Post-Graduate is associated with a statistically significant decrease (at the 1% level of significance) in food insecurity, *ceteris paribus*, e.g. attaining A' Level is likely to reduce food insecurity by 4.33% and by 4.40% when one attains Graduate and Post-Graduate level.
- Increasing household income by 1% decreases the probability of the household being food insecure by 11.6% at the 1% level of significance.
- The provincial dummies revealed that households in Bulawayo, Manicaland, Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces have an increased probability of being food insecure by 8.49%, 10.8%, 9.02%, 6.10%,12.3%, 15.3%, 7.92% and 7.99% respectively.

6.3.3 Coping with Shocks and Stressors

Shocks and stressors in urban areas

The results reveal a statistically significant difference at the 1% level of significance in HIV/AIDS affected households that indicated that they are able or not able to cope with the following shocks and stressors; price increases (1.8%), rental increases (4.1%), diarrhoeal diseases (2.8%) and health related (2.2%).

Coping with price increases

- The results show that 96% of the HIV/AIDS affected households indicated the impact of price increases to be severe as compared to 92% of unaffected households that reported the same. The 3.9% difference is statistically significant at the 1% level of significance.
- At least 62.8% of the affected households are not able to cope and 37.5% not able to recover from the impact of price increases.
- For the unaffected households, 56.9% are not able to cope and 36.3% did not recover from the price increases.
- Regarding the ability to cope with price increases in the future, 76.7% of the affected households are not able to cope and 72.9% of the surveyed unaffected households reported the same.
- However, there is no statistically significant association between household HIV/AIDS status and price increases
- However, there is a weakly association between household HIV/AIDS status and price increases as at the 5% level of significance, HIV/AIDS affected households have a 1.7% increased likelihood of being affected by price increases.
- An increased likelihood of the impact of price increases in households that are female headed (2.07%), practice Traditional religion (7.43%), have no religion (3.75%) and have an increase in household size (0.603%).
- The impact of price increases in likely to be high for households in Manicaland (4.37%), Mashonaland West (4.41%), Matabeleland South (3.53%) and Masvingo provinces (5.08%).
- Increasing age of household head by 1% increases the probability of the household coping with price increases by 0.17% at the 1% level of significance.
- However, increasing household income by 1% is likely to reduce the impact of price increases by 5.60%.

6.3.3.1 Rental increases

- There is a weakly association between household HIV/AIDS status and impact of rental increases. At the 5% level of significance, households with an HIV positive member have an 8.54% probability of not being able to recover from rental increases.
- Increasing age of household head by 1% is likely to increase the severity of rental increases by 0.19% and increases the inability of the affected household to cope with the rental increases by 0.463% at the 1% level of significance.
- Household heads with Primary education only have an increased likelihood of being not able to recover from rental increase by 24.7% at the 1% level of significance.
- Increasing household size has the propensity to increase the severity of the rental increases on the HIV/AIDS affected households.
- An increase in household income is most likely to reduce the impact of increasing rent by 2.11%, the ability of the household to cope with price increases by 4.09% and the ability to recover from the price increases by 2.99% at the 5% level of significance.

6.3.4 Shocks and stressors in rural areas

- The results reveal a statistically significant difference in mean difference between the ability of affected and unaffected households to cope with the following shocks and stressors; loss of employment (2.1%), death of breadwinner (1.2%), and drought (3.2%).

Loss of employment

- HIV/AIDS affected households are 1.88% more likely to have their member lose employment as compared to an unaffected household. However, there is no statistically significant difference in the households' abilities to cope, or recover from loss of employment.
- An increase in education level of household head reduces the likelihood of losses of employment, e.g. attaining Graduate/Post-graduates level reduce the probability of loss of employment by 2.18% at the 1% level of significance.
- Belonging to Islam religion reduces the ability of the household to cope with loss of employment by 53.2% at the 1% level of significance.

- Households with household heads that are married and living together with their spouse are 72.6% less likely to recover from loss of employment at the 1% level of significance. The situation is similar for affected households with married household heads living apart (78.5%) or divorced/separated (75.7%) or widowed (82.1%).
- An increase in household income reduces the ability of the affected households to cope with the loss of employment by 7.56% at the 1% level of significance.

Death of breadwinner

- The results show that the ability of the HIV/AIDS affected and unaffected rural households to cope with the death of breadwinner is statistically insignificant before controlling for observed variables.
- HIV/AIDS affected households have a 29.4% increased inability to recover from the death of the breadwinner.
- Households that are members of the Islam religion have a 50.3% increased likelihood of not being able to recover from the death of the breadwinners as compared to households that are members of other religions.
- Increasing household income by 1% reduces household's inability to recover from the death of a breadwinner by 8.83%.

Drought

- The results indicate a statistically significant difference at the 1% level of significance in the impact of drought between HIV/AIDS affected and not affected households.
- At least 90.7% of the HIV/AIDS affected households were affected by drought as compared to 87.65% of the HIV/AIDS unaffected households.
- The results show no association between Household HIV status and the impact of drought on rural households.
- However, increasing the education level of household head from Primary up to O' Level increases the ability of the household to cope with drought at the 1% level of significance.
- An increase in household income reduces the severity of drought on by 3%, it also reduces the inability to cope and inability recover from drought by 4.69% and 2.95% respectively.

- The severity of drought is increased by 5.8% and 8.17% for members of the Apostolic Sect and those that practice Traditional religion respectively.
- An increase in the age of household head by 1% reduced the inability of the household to recover from drought by 0.178%.

6.4 Recommendations for further research

- The results show that 76.2% of affected households were food insecure and whilst for the unaffected households it was 59.9%. Therefore, there is need for more research as to why HIV/AIDS affected households located in the rural areas are more able to cope but are not able to recover from stress and shocks as compared to their urban area counterparts.
- There is need for more research or data analysis on the impact of the different intervention programmes being implemented in the country on food security and coping ability of the HIV/AIDS affected households to the various shocks and stressors.

CHAPTER 7

Social Protection

7.1 Introduction

In the context of limited resources and vulnerability, people often lack adequate social safety nets, which would help mitigate the negative effects of shocks (economic crises, natural disasters, displacement, etc.). The more pronounced the situation of food insecurity, the more extreme the coping behaviour people have to resort to[30]. Coping behaviour may start with reducing the diversity of food but may quickly lead to taking children out of school to make them participate in labour or income-earning activities; it may also lead to increased mobility and sale of assets.

Selling assets does not directly imply a link to HIV transmission, but it can be an intermediate factor that leads to the eventual breakdown of family livelihoods. Thereby increasing people's vulnerability and often leading to the adoption of additional coping strategies that may place individuals at risk for the acquisition of HIV[31].

7.2 Social protection towards the affected

Nutritional support for treatment can work as an incentive for adherence and uptake. If the entire household is suffering from the shock of the disease and the lost productivity it has brought with it, income transfers to the rest of the family can become critical to prevent the household from engaging in irreversible, negative coping behaviours. This kind of support to the family of a patient provides a short-term, HIV-specific safety net against food insecurity that can be administered through cash, vouchers, or food transfers[32]. Whereas, households affected by HIV/AIDS are particularly susceptible to food insecurity, they are often least able to rely on social support for assistance. Borrowing and other transfers from kin and

[30] Frega et al (2010). Food Insecurity in the Context of HIV/AIDS: A Framework for a New Era of Programming. Food and Nutrition Bulletin, 31(4).

[31] Weiser et al. (2011). Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. Am J Clin Nutr, 94(6).

[32] Anema et al (2009). Food insecurity and HIV/AIDS: current knowledge, gaps, and research priorities. Current HIV/AIDS reports, 6(4), 224-231

social networks typically serve as informal insurance against health and agricultural shocks[33].

7.2.1 Descriptive analysis for Household HIV/AIDS status and social protection

The descriptive results in Table 57 shows the level of social support segregated by household HIV/AIDS status. The results show that the Government of Zimbabwe is the biggest provider of social support as it supported 44.1% of the HIV/AIDS affected households. Urban relatives are the second biggest provider of social support (18.6%) followed by relatives in the rural areas (15.3%) and then the UN/NGO (13.5%)

Table 57. HIV status and social protection

	National		Yes [Y]		No [N]		Difference
	Mean	S. D	Mean	S. D	Mean	S. D	
Government	0.341	0.474	0.441	0.497	0.325	0.469	0.116***
UN NGO	0.096	0.294	0.135	0.342	0.089	0.285	0.046***
Churches	0.042	0.201	0.053	0.224	0.041	0.197	0.012***
Relatives rural	0.151	0.358	0.153	0.360	0.150	0.357	0.002
Non relatives rural	0.103	0.304	0.113	0.317	0.102	0.302	0.011*
Relatives urban	0.175	0.380	0.186	0.389	0.173	0.378	0.013*
Non relatives urban	0.022	0.147	0.019	0.137	0.022	0.148	-0.003
Diaspora	0.114	0.318	0.117	0.322	0.114	0.317	0.004
Mutual group	0.021	0.143	0.032	0.175	0.019	0.137	0.013***
Civic group	0.010	0.101	0.014	0.118	0.010	0.098	0.004*
Charitable group	0.009	0.092	0.010	0.099	0.008	0.091	0.001
Private sector group	0.002	0.045	0.003	0.055	0.002	0.043	0.001

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

7.2.1.1 Correlates of HIV status and propensity to receive social support from the Government

Column (I) of table 54 displays no statistically significant association between household HIV/AIDS status and propensity to receive social support from

[33] Understanding the uneven spread of HIV within Africa: comparative study of biologic, behavioral, and contextual factors in rural populations in Tanzania and Zimbabwe. Boerma JT, Gregson S, Nyamukapa C, Urassa M Sex Transm Dis. 2003 Oct; 30(10):779-87.

government. However, robustness check in Columns (II) and (III) of Table 58 display a weakly significant positive association between household status and propensity to receive support from government. This could probably be because government support is mainly targeted at crop and livestock support.

The results in Columns (I) to Column (III) of Table 58 show that at the 1% level of significance, female-headed households and an increase in household income and age of household head increases the propensity of a household to receive social support from government, everything being constant. In addition, the results (Columns I to Column III) show that at the 1% level of significance, being located in the rural areas increases the propensity to receive social support from government. The results in Column I further reveal that being married and living apart and being divorced/separated reduce the propensity to receive social support from the government by 5.28% and 5.97% respectively, at the 1% level of significance. More so, results in Column (I) indicate that an increase in the education level of the household head reduces the propensity of the HIV/AIDS affected household to receive social support from the government by 4.27% at the 5% level of significance.

Results for the provincial dummies show that HIV/AIDS affected households in Manicaland have a reduced propensity to receive support from the government while the households in Bulawayo, Mashonaland Central, Mashonaland West, Matabeleland South and Midlands have an increased propensity to receive social support from the government at the 1% level of significance.

Table 58. Correlates of HIV status and propensity to receive support from the government

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is affected	0.0128	0.0660**	0.0973*
	(0.00913)	(0.0329)	(0.0570)
Household head is female	0.0398***	0.155***	0.244***
	(0.00682)	(0.0353)	(0.0641)
Household head age	0.00544***	0.0194***	0.0331***
	(0.000245)	(0.000930)	(0.00163)
Married living together	-0.0296**	-0.0948	-0.135
	(0.0131)	(0.0726)	(0.132)
Married living apart	-0.0528***	-0.164**	-0.224
	(0.0159)	(0.0794)	(0.143)
Divorced/separated	-0.0597***	-0.202**	-0.311**
	(0.0162)	(0.0821)	(0.149)

Widow/widower	-0.0296*	-0.103	-0.133
	(0.0163)	(0.0778)	(0.141)
Primary level	-0.0296**	-0.0481	-0.0625
	(0.0121)	(0.0390)	(0.0667)
ZJC level	-0.0468***	-0.0889*	-0.119
	(0.0138)	(0.0467)	(0.0797)
O' level	-0.0340***	-0.0644	-0.0961
	(0.0128)	(0.0435)	(0.0745)
A' level	-0.0313*	-0.196**	-0.386**
	(0.0163)	(0.0994)	(0.190)
Diploma/Certificate after primary	-0.0482	-0.105	-0.260
	(0.0359)	(0.180)	(0.358)
Diploma/Certificate after secondary	-0.0386**	-0.0795	-0.188
	(0.0170)	(0.0868)	(0.164)
Graduate/Post-Graduate	-0.0427**	-0.147	-0.338
	(0.0178)	(0.109)	(0.215)
Protestant	0.00633	0.0273	0.0622
	(0.0121)	(0.0535)	(0.0951)
Pentecostal	0.00862	0.0504	0.0866
	(0.0105)	(0.0480)	(0.0854)
Apostolic Sect	0.00585	0.0379	0.0689
	(0.0107)	(0.0446)	(0.0784)
Zion	0.00341	0.0326	0.0583
	(0.0142)	(0.0546)	(0.0941)
Other Christian	-0.0103	-0.0429	-0.0508
	(0.0134)	(0.0563)	(0.0988)
Islam	2.69e-05	0.0334	0.0686
	(0.0310)	(0.139)	(0.258)
Traditional	-0.0269	-0.0776	-0.113
	(0.0242)	(0.0803)	(0.136)
Other religion	-0.0783***	-0.273***	-0.516***
	(0.0236)	(0.101)	(0.170)
No religion	0.00130	0.0193	0.0476
	(0.0125)	(0.0513)	(0.0894)
N/a	-0.0158	-0.0687	-0.159
	(0.0188)	(0.0919)	(0.159)
Household size	0.0135***	0.0550***	0.0958***
	(0.00241)	(0.01000)	(0.0178)
ln (Household income)	-0.0115***	-0.0361***	-0.0620***
	(0.00254)	(0.0100)	(0.0174)
Household has mentally ill member	0.00269	-0.0166	-0.0330
	(0.00977)	(0.0276)	(0.0461)
Household members with alive mother	0.00423	0.00150	0.00138
	(0.00483)	(0.0175)	(0.0304)
Household members with alive father	-0.00959**	-0.0239	-0.0367
	(0.00446)	(0.0157)	(0.0273)
Household is located in rural area	0.425***	1.518***	2.673***
	(0.00851)	(0.0354)	(0.0658)
Bulawayo	0.0658***	0.523***	1.048***

	(0.0143)	(0.0857)	(0.166)
Manicaland	-0.0277***	0.0296	0.0842
	(0.0101)	(0.0661)	(0.133)
Mash Central	0.127***	0.595***	1.023***
	(0.0119)	(0.0666)	(0.135)
Mash East	-0.00638	0.135**	0.223*
	(0.00968)	(0.0647)	(0.131)
Mash West	0.0294***	0.280***	0.471***
	(0.00865)	(0.0626)	(0.129)
Mat North	-0.0273**	0.0258	0.0367
	(0.0115)	(0.0683)	(0.136)
Mat South	0.0585***	0.306***	0.569***
	(0.00986)	(0.0640)	(0.129)
Midlands	0.0519***	0.304***	0.590***
	(0.00812)	(0.0604)	(0.124)
Masvingo	-0.00297	0.105	0.199
	(0.0103)	(0.0661)	(0.132)
Constant	-0.108***	-2.479***	-4.399***
	(0.0270)	(0.127)	(0.233)
Observations	19,176	19,176	19,176
R-squared	0.354		

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

7.2.1.2 Correlates of HIV status and propensity to receive support from the UN/NGOs

Table 59 presents the correlates of HIV/AIDS household status and propensity to receive support from UN/NGOs. At the 5% level of significance, a household with an HIV positive member has a 1.47% (Column I) more likelihood to receive social support from UN/NGO. Probit and Logit estimates presented in Columns (II) and (III) put the increased likelihood at 10.1% and 15.3% respectively. However, Column (I) shows that at the 1% level of significance, an increase in the education level of the household head reduces the propensity of the household to receive support from UN/NGOs at an increasing rate. For example, attainment of A' Level reduces the propensity to receive support by 4.46% and by 5.19% for attaining a Diploma/Certificate after secondary.

Results of the religion dummies (Column I to III) show that HIV/AIDS affected households that are members of Zion have an increased propensity to receive social support from UN/NGOs. The results of the provincial dummies in Column (I) reveal that at the 1% level of significance, HIV/AIDS affected households located in Mat North and Mat South have a 60.3% and 3.72% increased propensity to receive social

support from UN/NGOs. On the other hand, at the 1% level of significance, HIV/AIDS affected households located in Bulawayo, Mashonaland East, Mashonaland West and Midlands provinces have a respectively 3.67%, 5,29%, 1,94% and 4,41% reduced propensity to receive social support from UN/NGOs.

Table 59. Correlates of HIV status and propensity to receive support from the UN/NGO

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Household is affected	0.0147**	0.101***	0.153**
	(0.00690)	(0.0389)	(0.0731)
Household head is female	0.00707	0.0666	0.124
	(0.00486)	(0.0431)	(0.0874)
Household head age	0.000736***	0.00443***	0.00800***
	(0.000180)	(0.00110)	(0.00210)
Married living together	-0.00496	-0.0300	-0.0406
	(0.00922)	(0.0849)	(0.171)
Married living apart	-0.0205*	-0.163*	-0.327*
	(0.0110)	(0.0961)	(0.192)
Divorced/separated	-0.000886	0.0120	-0.0112
	(0.0117)	(0.0965)	(0.191)
Widow/widower	-0.00710	-0.0445	-0.0708
	(0.0120)	(0.0913)	(0.180)
Primary level	-0.0272***	-0.0968**	-0.172**
	(0.00961)	(0.0440)	(0.0802)
ZJC level	-0.0288***	-0.0930*	-0.156
	(0.0106)	(0.0549)	(0.103)
O' level	-0.0387***	-0.184***	-0.355***
	(0.00975)	(0.0512)	(0.0971)
A' level	-0.0464***	-0.343***	-0.753***
	(0.0117)	(0.124)	(0.280)
Diploma/Certificate after primary	-0.0251	-0.0673	-0.167
	(0.0249)	(0.191)	(0.381)
Diploma/Certificate after secondary	-0.0519***	-0.316***	-0.682***
	(0.0118)	(0.113)	(0.247)
Graduate/Post-Graduate	-0.0438***	-0.209	-0.499*
	(0.0132)	(0.128)	(0.278)
Protestant	-0.00742	-0.0858	-0.155
	(0.00825)	(0.0705)	(0.141)
Pentecostal	0.00279	0.00485	0.0224
	(0.00742)	(0.0600)	(0.120)
Apostolic Sect	0.00860	0.0468	0.129
	(0.00753)	(0.0552)	(0.108)
Zion	0.0481***	0.232***	0.436***
	(0.0113)	(0.0639)	(0.122)
Other Christian	-0.00415	-0.0234	-0.0561
	(0.00955)	(0.0702)	(0.137)
Islam	0.00686	0.0675	0.0861
	(0.0226)	(0.176)	(0.356)
Traditional	0.00843	0.0572	0.0947
	(0.0183)	(0.0999)	(0.189)
Other religion	-0.0104	-0.0555	-0.0602
	(0.0155)	(0.117)	(0.227)
No religion	0.0223**	0.125**	0.264**

	(0.00922)	(0.0621)	(0.120)
N/a	0.00760	0.0450	0.0709
	(0.0132)	(0.110)	(0.221)
Household size	0.00575***	0.0383***	0.0728***
	(0.00189)	(0.0117)	(0.0224)
ln (Household income)	0.0117***	0.0762***	0.159***
	(0.00182)	(0.0123)	(0.0238)
Household has mentally ill member	0.00252	-5.67e-05	-0.00535
	(0.00719)	(0.0320)	(0.0584)
Household members with alive mother	0.00799**	0.0234	0.0357
	(0.00399)	(0.0200)	(0.0367)
Household members with alive father	-0.00426	-0.00352	0.000206
	(0.00371)	(0.0178)	(0.0322)
Household is located in rural area	0.104***	0.777***	1.627***
	(0.00577)	(0.0446)	(0.0953)
Bulawayo	-0.0367***	-0.624***	-1.443***
	(0.00667)	(0.164)	(0.428)
Manicaland	-0.00445	-0.0692	-0.191
	(0.00814)	(0.0724)	(0.156)
Mash Central	0.000239	-0.0628	-0.160
	(0.00877)	(0.0717)	(0.153)
Mash East	-0.0529***	-0.475***	-1.018***
	(0.00642)	(0.0756)	(0.165)
Mash West	-0.0194***	-0.132*	-0.411**
	(0.00717)	(0.0726)	(0.164)
Mat North	0.0603***	0.183***	0.300**
	(0.00994)	(0.0681)	(0.145)
Mat South	0.0372***	0.0759	0.118
	(0.00892)	(0.0671)	(0.143)
Midlands	-0.0441***	-0.419***	-0.875***
	(0.00634)	(0.0731)	(0.160)
Masvingo	-0.0150*	-0.170**	-0.353**
	(0.00786)	(0.0716)	(0.154)
Constant	-0.0632***	-2.487***	-4.654***
	(0.0198)	(0.150)	(0.300)
Observations	19,173	19,173	19,173
R-squared	0.072		

Robust standard errors in parentheses

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

9.3.2. Correlates of household HIV/AIDS status and propensity to receive support from the churches

The results presented in Column (I) of Table 60 reveal very weak association of household HIV/AIDS status and the propensity to receive support from churches. However, results in Column (I) also reveal that at the 1% level of significance, an increase in the age of household head by 1% increases the likelihood of the affected household receiving social support, *ceteris paribus*. In addition, female and

widow/widower headed households have a 0.814% and 6.06% increased probability to receive social support respectively, at the 5% level of significance.

Results of the religion dummies (Column I) reveal that at the 1% level of significance, being a member of Islam and Pentecostal church increase the likelihood of an HIV/AIDS affected household to receive social support by 1.81% and 33% respectively, all things being constant. However, practicing Traditional religion reduces the probability of receiving social support from churches by 1.82% at the 5% level of significance. The results of the provincial dummies (Column I) indicate that HIV/AIDS affected households located in Bulawayo, Mash East and Masvingo provinces have respectively 3.29%, 1.81% and 1.99% reduced likelihood of receiving social support from churches at the 1% level of significance. However, the HIV/AIDS affected households located in Matabeleland South have a 6.27% increased propensity of receiving social support from churches.

Table 60. Correlates of HIV status and propensity to receive support from the churches

VARIABLES	OLS (I)	Probit (II)	Logit (III)
Household is affected	0.00803*	0.0887*	0.192*
	(0.00477)	(0.0479)	(0.102)
Household head is female	0.00814**	0.111**	0.223**
	(0.00413)	(0.0458)	(0.0989)
Household head age	0.000606***	0.00723***	0.0157***
	(0.000128)	(0.00139)	(0.00299)
Married living together	0.0106	0.132	0.283
	(0.00754)	(0.0978)	(0.215)
Married living apart	0.000773	0.0263	0.0209
	(0.00844)	(0.112)	(0.248)
Divorced/separated	0.00203	0.0286	0.0671
	(0.00891)	(0.113)	(0.248)
Widow/widower	0.0200**	0.204*	0.436*
	(0.00924)	(0.106)	(0.231)
Primary level	0.00618	0.0550	0.139
	(0.00578)	(0.0647)	(0.139)
ZJC level	0.0203***	0.196**	0.468***
	(0.00723)	(0.0764)	(0.166)
O' level	0.0116*	0.116	0.288*
	(0.00648)	(0.0742)	(0.164)
A' level	0.0163	0.176	0.407
	(0.0108)	(0.117)	(0.257)
Diploma/Certificate after primary	0.0257	0.239	0.536
	(0.0227)	(0.191)	(0.399)
Diploma/Certificate after secondary	0.0239**	0.242**	0.541**

	(0.0109)	(0.106)	(0.225)
Graduate/Post-Graduate	0.0268**	0.287**	0.585**
	(0.0134)	(0.121)	(0.257)
Protestant	0.00971	0.108	0.222
	(0.00713)	(0.0733)	(0.158)
Pentecostal	0.0181***	0.194***	0.407***
	(0.00629)	(0.0645)	(0.139)
Apostolic Sect	0.00113	0.0183	0.0222
	(0.00560)	(0.0643)	(0.141)
Zion	-0.0114	-0.114	-0.300
	(0.00709)	(0.0869)	(0.192)
Other Christian	0.000841	0.0305	0.0164
	(0.00747)	(0.0807)	(0.176)
Islam	0.330***	1.482***	2.775***
	(0.0393)	(0.119)	(0.212)
Traditional	-0.0182**	-0.368*	-0.928**
	(0.00798)	(0.188)	(0.473)
Other religion	-0.00450	-0.0249	-0.124
	(0.0127)	(0.142)	(0.314)
No religion	-0.0125**	-0.197**	-0.440**
	(0.00617)	(0.0822)	(0.188)
N/a	-0.00381	-0.0454	-0.130
	(0.00953)	(0.131)	(0.301)
Household size	0.00158	0.0162	0.0338
	(0.00136)	(0.0135)	(0.0284)
ln (Household income)	0.00248*	0.0292*	0.0703**
	(0.00132)	(0.0149)	(0.0321)
Household has mentally ill member	0.000833	0.00938	0.0230
	(0.00410)	(0.0490)	(0.108)
Household members with alive mother	-0.00388	-0.0308	-0.0769
	(0.00252)	(0.0256)	(0.0543)
Household members with alive father	0.000971	0.000744	0.00810
	(0.00228)	(0.0239)	(0.0514)
Household is located in rural area	-0.00345	-0.0535	-0.108
	(0.00420)	(0.0492)	(0.106)
Bulawayo	-0.0329***	-0.471***	-1.053***
	(0.00786)	(0.135)	(0.326)
Manicaland	-0.0113	-0.119	-0.285*
	(0.00692)	(0.0777)	(0.171)
Mash Central	-0.00622	-0.0845	-0.169
	(0.00712)	(0.0806)	(0.177)
Mash East	-0.0181***	-0.235***	-0.524***
	(0.00632)	(0.0751)	(0.168)
Mash West	-0.00522	-0.0613	-0.117
	(0.00643)	(0.0677)	(0.146)
Mat North	-0.0162**	-0.228***	-0.473**
	(0.00689)	(0.0859)	(0.196)
Mat South	0.0627***	0.480***	0.998***
	(0.00920)	(0.0685)	(0.143)

Midlands	0.00402	0.0406	0.104
	(0.00695)	(0.0676)	(0.145)
Masvingo	-0.0199***	-0.255***	-0.603***
	(0.00645)	(0.0820)	(0.187)
Constant	-0.0241	-2.532***	-4.914***
	(0.0149)	(0.179)	(0.393)
Observations	19,172	19,172	19,172
R-squared	0.042		

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

7.3 Resilience of the affected households

7.3.1 Ability to lean on external parties

7.3.1.1 Descriptive analysis for HIV status and ability to lean on external parties

Table 61 shows the perceptions of the households on their ability to lean on various parties in their time of need. The table shows that households that are affected by HIV/AIDS felt they were more able to lean on the government and UN/NGOs more than their counterparts that are not affected by HIV/AIDS before controlling for confounding variables. The respective differences in proportions at the 99% level of confidence are 6.1% and 3.2%. HIV affected households were less able to lean on the other parties such as churches, relatives or relatives than their counterparts that are not affected.

Table 61. Household HIV/AIDS status and resilience

	National		Yes [Y]	No [N]			Difference
	Mean	S. D	Mean	Mean	S. D	Mean	
Government	0.535	0.499	0.587	0.492	0.526	0.499	0.061***
NGO	0.455	0.498	0.483	0.500	0.450	0.498	0.032***
Churches	0.350	0.477	0.331	0.471	0.353	0.478	-0.022**
Rural relative	0.399	0.490	0.361	0.480	0.405	0.491	-0.045***
Rural non-relative	0.306	0.461	0.291	0.454	0.308	0.462	-0.017*
Urban relative	0.357	0.479	0.330	0.470	0.361	0.480	-0.031**
Urban non-relative	0.170	0.376	0.155	0.362	0.172	0.378	-0.017**
Diaspora	0.235	0.424	0.207	0.405	0.240	0.427	-0.033***
Mutual	0.138	0.345	0.135	0.341	0.139	0.346	-0.004
Civic	0.124	0.330	0.111	0.315	0.126	0.332	-0.015**

Charitable	0.143	0.350	0.118	0.323	0.147	0.354	-0.029***

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

7.3.1.2 Correlates of HIV status and ability to lean on external parties

Table 62 shows that after controlling for observed confounding variables, the only differences in the perceptions to lean existed only for UN/NGO and the diaspora. Column (II) of the table shows that at the 1% level of significance, households that are affected by HIV/AIDS were 30.7% more likely to be able to lean on UN/NGO than their counterparts that are not affected after controlling for observed confounders. Column (VIII) however shows that at the 95% level of confidence, households that are affected by HIV/AIDS were 1.89% less likely to be able to lean on friends and relatives in the diaspora compared to their counterparts that are not affected.

Table 62. Correlates of Household HIV/AIDS status and ability to lean on external parties

VARIABLES	Gvt	NGO	Churches	Rural relatives	Rural non-relatives	Urban relatives	Urban non-relatives	Diaspora	Mutual	Civic	Charitable
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)	(XI)
Household is affected	0.0129	0.0307***	0.0168	-0.00485	0.00891	0.00202	0.0128	-0.0189**	0.0105	0.00526	-0.00446
	(0.0110)	(0.0115)	(0.0106)	(0.0109)	(0.0103)	(0.0106)	(0.00827)	(0.00903)	(0.00786)	(0.00737)	(0.00758)
Household head is female	0.0151	-0.00687	0.0287***	0.0349***	0.0314***	0.0399***	0.0140*	0.0259***	-0.00950	-0.0171**	-0.0180**
	(0.0102)	(0.0104)	(0.0101)	(0.0102)	(0.00977)	(0.0101)	(0.00836)	(0.00912)	(0.00765)	(0.00737)	(0.00782)
Household head age	0.00145***	5.39e-05	0.000315	-0.000197	-0.000629**	0.00146***	0.000232	0.00181***	0.000940***	0.000241	0.000305
	(0.000304)	(0.000320)	(0.000299)	(0.000309)	(0.000289)	(0.000300)	(0.000232)	(0.000265)	(0.000221)	(0.000208)	(0.000217)
Married living together	0.0596***	0.0526***	0.0751***	0.0831***	0.0813***	0.0498**	0.0353**	-0.0152	0.00851	0.0183	0.0215
	(0.0200)	(0.0203)	(0.0192)	(0.0197)	(0.0186)	(0.0193)	(0.0161)	(0.0182)	(0.0149)	(0.0142)	(0.0149)
Married living apart	0.0190	0.0192	0.0283	0.0433*	0.0541**	0.0408*	0.0120	0.0619***	0.0197	0.0333**	0.0303*
	(0.0232)	(0.0235)	(0.0222)	(0.0229)	(0.0217)	(0.0225)	(0.0183)	(0.0215)	(0.0174)	(0.0167)	(0.0172)
Divorced/separated	0.0237	0.0218	-0.00145	0.0218	0.0358	-0.00543	-0.00450	-0.0278	-0.0106	0.00933	0.0105
	(0.0238)	(0.0241)	(0.0225)	(0.0233)	(0.0221)	(0.0227)	(0.0185)	(0.0210)	(0.0172)	(0.0165)	(0.0172)
Widow/widower	0.0481**	0.0519**	0.0443**	0.0485**	0.0492**	0.0440**	0.0305*	-0.0139	0.000886	0.0243	0.0341**
	(0.0230)	(0.0235)	(0.0221)	(0.0227)	(0.0214)	(0.0222)	(0.0183)	(0.0206)	(0.0171)	(0.0163)	(0.0170)
Primary level	0.00728	0.00112	0.0367***	0.00760	0.0250**	0.0425***	0.0362***	0.0226**	0.0321***	0.0261***	0.0177**
	(0.0135)	(0.0144)	(0.0127)	(0.0136)	(0.0125)	(0.0130)	(0.00899)	(0.0108)	(0.00866)	(0.00778)	(0.00821)
ZJC level	0.000689	0.0352**	0.0594***	0.00781	0.0164	0.0460***	0.0474***	0.0315**	0.0554***	0.0490***	0.0348***
	(0.0161)	(0.0170)	(0.0155)	(0.0162)	(0.0150)	(0.0155)	(0.0113)	(0.0131)	(0.0110)	(0.0103)	(0.0107)
O' level	0.000533	0.0192	0.0520***	0.0211	0.0348**	0.0646***	0.0534***	0.0469***	0.0533***	0.0423***	0.0370***
	(0.0149)	(0.0156)	(0.0141)	(0.0149)	(0.0138)	(0.0142)	(0.0102)	(0.0119)	(0.00978)	(0.00906)	(0.00957)
A' level	-0.0192	0.000628	0.0404	0.00929	0.0165	0.0636**	0.0754***	0.0679***	0.0627***	0.0412**	0.0391**
	(0.0254)	(0.0264)	(0.0253)	(0.0257)	(0.0243)	(0.0250)	(0.0210)	(0.0227)	(0.0193)	(0.0184)	(0.0198)
Diploma/Certificate after primary	0.0360	0.0620	0.0509	0.00708	0.0535	0.0941**	0.108***	0.0818*	0.0992**	0.0715*	0.0503
	(0.0484)	(0.0486)	(0.0474)	(0.0473)	(0.0452)	(0.0473)	(0.0416)	(0.0448)	(0.0394)	(0.0366)	(0.0371)
Diploma/Certificate after secondary	-0.0390	-0.0145	0.0350	0.00680	0.0263	0.0427*	0.0383**	0.0449**	0.0236	0.0156	0.00754
	(0.0242)	(0.0248)	(0.0239)	(0.0244)	(0.0230)	(0.0238)	(0.0188)	(0.0216)	(0.0169)	(0.0162)	(0.0173)
Graduate/Post-Graduate	-0.0732***	-0.0303	0.0204	-0.0262	0.00895	0.0454	0.0555**	0.0637**	0.0414**	0.0340*	0.0252
	(0.0272)	(0.0282)	(0.0275)	(0.0281)	(0.0265)	(0.0277)	(0.0227)	(0.0255)	(0.0205)	(0.0199)	(0.0211)
Protestant	-0.00292	-0.0189	-0.00198	-0.00722	-0.0242	-0.0232	-0.0336**	-0.0365**	-0.0169	-0.0204*	-0.0115

	(0.0169)	(0.0175)	(0.0167)	(0.0169)	(0.0160)	(0.0168)	(0.0135)	(0.0151)	(0.0124)	(0.0117)	(0.0125)
Pentecostal	-0.0179	-0.0231	-0.00216	-0.00881	-0.0212	-0.0378***	-0.0293**	-0.0439***	-0.0225**	-0.0135	-0.0156
	(0.0147)	(0.0152)	(0.0145)	(0.0148)	(0.0140)	(0.0146)	(0.0120)	(0.0132)	(0.0109)	(0.0106)	(0.0111)
Apostolic Sect	0.0157	0.00928	0.00559	-0.0179	-0.0207	-0.0444***	-0.0204*	-0.0393***	-0.00363	-0.00319	0.000149
	(0.0142)	(0.0147)	(0.0138)	(0.0142)	(0.0134)	(0.0139)	(0.0113)	(0.0124)	(0.0105)	(0.0100)	(0.0105)
Zion	0.0225	-0.0156	-0.0245	-0.0230	-0.0424**	-0.0513***	-0.0376***	-0.0128	-0.0131	-0.0198	-0.0177
	(0.0179)	(0.0188)	(0.0175)	(0.0180)	(0.0170)	(0.0176)	(0.0138)	(0.0159)	(0.0130)	(0.0120)	(0.0124)
Other Christian	-0.0135	-0.0527***	-0.0291*	-0.0533***	-0.0547***	-0.0561***	-0.0410***	-0.0411***	-0.0147	-0.0224*	-0.0203
	(0.0179)	(0.0184)	(0.0174)	(0.0178)	(0.0167)	(0.0177)	(0.0141)	(0.0158)	(0.0132)	(0.0124)	(0.0131)
Islam	0.00142	-0.0515	0.157***	-0.0465	-0.0603	-0.0295	-0.0360	-0.0648*	0.00224	-0.0270	-0.00931
	(0.0418)	(0.0439)	(0.0435)	(0.0425)	(0.0395)	(0.0430)	(0.0334)	(0.0362)	(0.0325)	(0.0300)	(0.0346)
Traditional	-0.0352	-0.0755**	-0.128***	-0.125***	-0.141***	-0.103***	-0.0639***	-0.0716***	-0.0425***	-0.0246	-0.0314*
	(0.0294)	(0.0293)	(0.0229)	(0.0257)	(0.0222)	(0.0246)	(0.0173)	(0.0203)	(0.0165)	(0.0162)	(0.0163)
Other religion	-0.0418	-0.0307	-0.0176	-0.0393	-0.0549*	-0.0451	-0.00950	-0.0291	0.0168	0.0267	0.00744
	(0.0309)	(0.0313)	(0.0293)	(0.0298)	(0.0281)	(0.0294)	(0.0239)	(0.0262)	(0.0231)	(0.0226)	(0.0225)
No religion	0.0149	0.00455	-0.0800***	-0.0129	-0.00843	-0.0389**	-0.0320**	-0.0475***	-0.0117	-0.00382	-0.00341
	(0.0166)	(0.0171)	(0.0157)	(0.0165)	(0.0157)	(0.0161)	(0.0128)	(0.0142)	(0.0121)	(0.0116)	(0.0122)
N/a	-0.0451*	-0.0352	-0.0848***	-0.0218	-0.00239	-0.0770***	0.00808	-0.0288	0.0242	-0.00850	-0.0109
	(0.0274)	(0.0279)	(0.0261)	(0.0274)	(0.0266)	(0.0263)	(0.0228)	(0.0242)	(0.0216)	(0.0198)	(0.0209)
Household size	-0.00277	0.000801	-0.00809***	-0.00830***	-0.00316	-0.00573*	-0.00471*	-0.00860***	-0.00599***	-0.00217	-0.00363
	(0.00315)	(0.00328)	(0.00307)	(0.00318)	(0.00299)	(0.00309)	(0.00243)	(0.00271)	(0.00229)	(0.00216)	(0.00228)
ln (Household income)	-0.0146***	-0.00670**	0.0106***	0.0154***	0.00958***	0.0271***	0.00640**	0.0446***	0.00371	0.00130	7.07e-05
	(0.00331)	(0.00340)	(0.00320)	(0.00328)	(0.00310)	(0.00319)	(0.00256)	(0.00291)	(0.00243)	(0.00231)	(0.00242)
Household has mentally ill member	0.00745	-0.0192*	-0.00357	-0.0248**	-0.0114	-0.0202**	-0.00666	-0.0155**	-0.00357	-0.000204	-0.000261
	(0.00992)	(0.0106)	(0.00972)	(0.00991)	(0.00910)	(0.00954)	(0.00626)	(0.00747)	(0.00633)	(0.00570)	(0.00575)
Household members with alive mother	0.0103*	0.0117*	0.00772	-0.000834	-0.00559	-0.0147***	-0.00712*	0.00512	0.00205	-0.00678*	-0.00432
	(0.00586)	(0.00621)	(0.00564)	(0.00580)	(0.00541)	(0.00566)	(0.00407)	(0.00497)	(0.00404)	(0.00368)	(0.00389)
Household members with alive father	-0.00109	0.000104	0.00160	0.00806	0.00692	0.0139***	0.00939**	0.00370	0.00415	0.00959***	0.00764**
	(0.00536)	(0.00570)	(0.00519)	(0.00531)	(0.00493)	(0.00517)	(0.00365)	(0.00448)	(0.00366)	(0.00328)	(0.00346)
Household is located in rural area	0.202***	0.0414***	-0.0980***	-0.0214*	-0.0184*	-0.0181*	-0.0715***	0.00694	-0.0360***	-0.0577***	-0.0930***
	(0.0112)	(0.0114)	(0.0108)	(0.0111)	(0.0105)	(0.0109)	(0.00864)	(0.00961)	(0.00807)	(0.00771)	(0.00811)
Bulawayo	-0.0407	-0.169***	-0.232***	-0.170***	-0.210***	-0.201***	-0.0976***	-0.0403	-0.0397*	-0.0446**	-0.112***
	(0.0250)	(0.0243)	(0.0235)	(0.0252)	(0.0225)	(0.0249)	(0.0214)	(0.0245)	(0.0212)	(0.0210)	(0.0216)
Manicaland	-0.123***	-0.0744***	-0.0955***	-0.110***	-0.115***	-0.120***	-0.0790***	-0.166***	-0.112***	-0.132***	-0.185***
	(0.0173)	(0.0180)	(0.0174)	(0.0175)	(0.0170)	(0.0174)	(0.0152)	(0.0153)	(0.0136)	(0.0131)	(0.0139)

Mash Central	-0.0353**	-0.149***	-0.120***	-0.0981***	-0.142***	-0.126***	-0.129***	-0.160***	-0.125***	-0.136***	-0.172***
	(0.0176)	(0.0180)	(0.0173)	(0.0178)	(0.0170)	(0.0174)	(0.0144)	(0.0153)	(0.0135)	(0.0132)	(0.0141)
Mash East	-0.0738***	-0.156***	-0.0925***	-0.0952***	-0.129***	-0.0990***	-0.0674***	-0.0981***	-0.0788***	-0.0704***	-0.104***
	(0.0165)	(0.0167)	(0.0163)	(0.0164)	(0.0160)	(0.0163)	(0.0146)	(0.0151)	(0.0136)	(0.0136)	(0.0145)
Mash West	0.0813***	-0.0172	-0.0192	-0.0587***	-0.0975***	-0.0967***	-0.105***	-0.0963***	-0.0964***	-0.0907***	-0.0974***
	(0.0159)	(0.0164)	(0.0160)	(0.0159)	(0.0155)	(0.0157)	(0.0137)	(0.0145)	(0.0129)	(0.0129)	(0.0142)
Mat North	-0.116***	-0.0975***	-0.196***	-0.223***	-0.167***	-0.274***	-0.162***	-0.151***	-0.148***	-0.180***	-0.229***
	(0.0179)	(0.0188)	(0.0172)	(0.0175)	(0.0172)	(0.0167)	(0.0140)	(0.0156)	(0.0131)	(0.0121)	(0.0129)
Mat South	0.0403**	0.0159	-0.0253	-0.0690***	-0.0183	-0.0868***	-0.00434	0.0331*	0.0127	0.00345	-0.0544***
	(0.0177)	(0.0182)	(0.0177)	(0.0177)	(0.0175)	(0.0176)	(0.0159)	(0.0170)	(0.0153)	(0.0151)	(0.0157)
Midlands	-0.0541***	-0.141***	-0.118***	-0.156***	-0.150***	-0.132***	-0.126***	-0.105***	-0.107***	-0.108***	-0.140***
	(0.0161)	(0.0165)	(0.0160)	(0.0160)	(0.0156)	(0.0159)	(0.0138)	(0.0148)	(0.0130)	(0.0130)	(0.0140)
Masvingo	-0.00198	-0.0514***	-0.0756***	-0.0813***	-0.129***	-0.158***	-0.114***	-0.146***	-0.128***	-0.123***	-0.180***
	(0.0174)	(0.0179)	(0.0175)	(0.0176)	(0.0167)	(0.0171)	(0.0145)	(0.0154)	(0.0132)	(0.0132)	(0.0140)
Constant	0.399***	0.471***	0.339***	0.394***	0.338***	0.248***	0.220***	0.0382	0.166***	0.201***	0.288***
	(0.0373)	(0.0384)	(0.0360)	(0.0372)	(0.0350)	(0.0361)	(0.0293)	(0.0329)	(0.0273)	(0.0261)	(0.0275)
Observations	17,531	17,335	17,719	17,997	17,910	18,006	17,856	18,020	17,604	17,572	17,546
R-squared	0.086	0.024	0.050	0.029	0.027	0.042	0.046	0.068	0.035	0.046	0.065

Robust standard errors in parentheses

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

7.4 Chapter summary

7.4.1 Analysis for HIV/AIDS status and social protection

- The results show that the Government of Zimbabwe is the biggest provider of social support as it supported 44.1% of the HIV/AIDS affected households.
- Urban relatives are the second biggest provider of social support (18.6%) followed by relatives in the rural areas (15.3%) and then the UN/NGO (13.5%).

HIV/AIDS and status and propensity to receive social support from support from the government

- There is no statistically significant association between household HIV/AIDS status and propensity to receive social support from government.
- However, robustness check display weakly significant positive association between household status and propensity to receive support from government. This could probably be because government support is mainly targeted at crop and livestock support.
- Female-headed households and an increase in household income and age of household head increases the propensity of a household to receive social support from government, everything being constant.
- Being located in the rural areas increases the propensity to receive social support from government.
- Being married and living apart and being divorced/separated reduce the propensity to receive social support from the government by 5.28% and 5.97% respectively, at the 1% level of significance.
- An increase in the education level of the household head reduces the propensity of the HIV/AIDS affected household to receive social support from the government by 4.27% at the 5% level of significance.
- Results for the provincial dummies show that HIV/AIDS affected households in Manicaland have a reduced propensity to receive support from the government while the households in Bulawayo, Mashonaland Central, Mashonaland West, Matabeleland South and Midlands have an increased propensity to receive social support from the government.

HIV/AIDS status and propensity to receive support from the UN/NGOs

- At the 5% level of significance, a household with an HIV positive member has a 1.47% more likelihood to receive social support from UN/NGO.
- Probit and Logit estimates put the increased likelihood at 10.1% and 15.3% respectively.
- An increase in the education level of household head reduces the propensity of the household to receive support from UN/NGOs at an increasing rate. For example, attainment of A' Level reduces the propensity to receive support by 4.46% and by 5.19% for attaining a Diploma/Certificate after secondary.
- HIV/AIDS affected households that are members of Zion have an increased propensity to receive social support from UN/NGOs.
- HIV/AIDS affected households located in Mat North and Mat South have a 60.3% and 3.72% increased propensity to receive social support from UN/NGOs.
- On the other hand, at the 1% level of significance, HIV/AIDS affected households located in Bulawayo, Mashonaland East, Mashonaland West and Midlands provinces have a respectively 3.67%, 5,29%, 1,94% and 4,41% reduced propensity to receive social support from UN/NGOs.

HIV/AIDS status and propensity to receive support from the churches

- The results reveal a very weak association of household HIV/AIDS status and the propensity to receive support from churches.
- An increase in the age of household head by 1% increases the likelihood of the affected household receiving social support.
- Female and widow/widower headed households have a 0.814% and 6.06% increased probability to receive social support respectively, at the 5% level of significance.
- Results of the religion dummies reveal that at the 1% level of significance, being a member of Islam and Pentecostal church increase the likelihood of an HIV/AIDS household to receive social support by 1.81% and 33% respectively, all things being constant.
- However, practicing Traditional religion reduces the probability of receiving social support from churches by 1.82% at the 5% level of significance.
- The results of the provincial dummies indicate that HIV/AIDS affected households located in Bulawayo, Mash East and Masvingo provinces have respectively

3.29%, 1.81% and 1.99% reduced likelihood of receiving social support from churches at the 1% level of significance.

- Finally, HIV/AIDS affected households located in Matabeleland South have a 6.27% increased propensity of receiving social support from churches.

7.5 Resilience of the affected households

7.5.1 HIV/AIDS status and ability to lean on external parties

- Households that are affected by HIV/AIDS felt they were more able to lean on the government and UN/NGOs more than their counterparts that are not affected by HIV/AIDS before controlling for confounding variables.
- The respective differences in proportions at the 99% level of confidence are 6.1% and 3.2%.
- HIV/AIDS affected households were less able to lean on the other parties such as churches, relatives or relatives than their counterparts that are not affected.
- Households that are affected by HIV/AIDS were 30.7% more likely to be able to lean on UN/NGO than their counterparts that are not affected after controlling for observed confounders.
- Households that are affected by HIV/AIDS were 1.89% less likely to be able to lean on friends and relatives in the diaspora than their counterparts that are not affected.

7.5 Recommendations for further research

- The Government of Zimbabwe is the biggest provider of social support and this result is very much commended.
- However, the lack of statistically significant association between household HIV/AIDS status and propensity to receive social support from government is an indication that social support from government is not selective or specifically targeting HIV/AIDS affected households. There is be need for the government programmes to foster HIV sensitive social protection.

CHAPTER 8

Heterogeneity in the Treatment Effects of Government Support on Coping with HIV/AIDS Burden

8.1 Introduction

This chapter establishes the treatment effects of government social protection support on the household ability to cope with the HIV/AIDS burden. Assessing the treatment or impact of the government support using observational data from the livelihoods assessments is confounded by incomplete information arising from the self-selection of observations into treatment.[34,35,36]

Propensity Score Matching (PSM) and Inverse Probability Weighting (IPW) is used to reduce or eliminate the confounding effects of observational survey data as observational or non-randomized studies suffer from selection bias unlike randomized control trials (RCTs) which use random treatment allocation.[37] Using PSM and IPW, this chapter reduces or eliminate the problem of systemic differences in baseline characteristics between treated and untreated groups.[38]

8.2 Heterogeneity in the treatment effect of government support on the severity of HIV/AIDS impact

Table 63 shows the rural versus urban heterogenic treatment effects of government support on the severity of HIV/AIDS impact on the household. According to Column (I) of the table, receiving government support by the government reduces the severity of the impact HIV/AIDS on the household by 7.92% at the 5% level of significance. When one considers rural households alone, the probability that the household felt severe impact of having a household member infected by HIV/AIDS in the year of the survey reduces by 9.43% at the 5% level of statistical significance. The sum total of the findings is that government support reduced the severity of the

[34] 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. doi: 10.1080/00273171.
[35] Caliendo, M. & Kopeinig, S. (2008). Some Practical Guidance for the Implementation of Propensity Score Matching. Journal of Economic Surveys, 22(1), 31-72. doi: 10.1111/j.1467-6419.2007.00527.x
[36] Heckman, J., Ichimura, H., & Todd, P. (1997). Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme. Review of Economic Studies, 64(4), 605-6.
[37] Ibid
[38] Ibid

impact of having a household member being infected by HIV/AIDS more in rural areas than in urban areas. This finding is consistent with the findings in Chapter 4.

Table 63. Heterogeneity in the treatment effect of government support on HIV/AIDS impact severity

VARIABLES	National	Rural
	(I)	(II)
Treatment effect of government support on impact severity	-0.0792**	-0.0943**
	(0.0397)	(0.0430)
Observations	1,162	891

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

8.3 Heterogeneity in the treatment effect of government support on household inability to cope with the HIV burden

Table 64 shows the heterogeneity in the treatment effect of government support on household inability to cope with the HIV/AIDS burden. Columns (I) and (II) shows that government support is not statistically valid in reducing the inability of the household to cope with the HIV/AIDS burden both at the national level and in rural areas alone.

Table 64. Heterogeneity in the treatment effect of government support on household inability to cope with HIV burden

VARIABLES	National	Rural
	(I)	(II)
Treatment effect of government support on inability to cope	-0.0409	-0.0295
	(0.0383)	(0.0371)
Observations	1,149	882

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

8.4 Heterogeneity in the treatment effect of government support on household inability to recover from HIV/AIDS burden

Column (I) of Table 65 shows that at the national level, government support is

associated with the reduction in the probability that the household is unable to recover from the HIV/AIDS burden of 6.04% at the 10% level of significance. The impact of government support on reducing the inability of households to recover from the HIV/AIDS burden is however not statistically valid. The conclusion to be reached from the table is that government support reduces the probability of that the household is unable to cope with the HIV/AIDS burden more in urban areas than in rural areas. This finding is consistent with the findings in Chapter 4 of this document.

Table 65. Heterogeneity in the treatment effect of government support on household inability to recover from HIV/AIDS burden

VARIABLES	National (I)	Rural (II)
Treatment effect of government support on inability to recover	-0.0604*	0.00457
	(0.0324)	(0.0452)
Observations	795	657

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

8.5 Chapter Summary

8.5.1 Heterogeneity in the treatment effect of government support on the severity of HIV/AIDS impact

- Regarding rural versus urban heterogenic treatment effects of government support on the severity of HIV/AIDS impact on the household, the results show that receiving government support by the government reduces the severity of the impact HIV/AIDS on the household by 7.92% at the 5% level of significance.
- Considering rural households alone, the probability that the household felt severe impact of having a household member infected by HIV/AIDS in the year of the survey reduces by 9.43% at the 5% level of statistical significance.
- The sum total of the findings is that government support reduced the severity of the impact of having a household member being infected by HIV/AIDS more in rural areas than in urban areas. This finding is consistent with the findings in Chapter 4.

8.5.2 Heterogeneity in the treatment effect of government support on household inability to cope with the HIV burden

- In relation to the heterogeneity in the treatment effect of government support on household inability to cope with the HIV/AIDS burden, the results show that government support is not statistically valid in reducing the inability of the household to cope with the HIV/AIDS burden both at the national level and in rural areas alone.

8.5.3 Heterogeneity in the treatment effect of government support on household inability to recover from HIV/AIDS burden

- National level, government support is associated with the reduction in the probability that the household is unable to recover from the HIV/AIDS burden of 6.04% at the 10% level of significance.
- The impact of government support on reducing the inability of households to recover from the HIV/AIDS burden is however not statistically valid.
- The conclusion to be reached from the results is that government support reduces the probability of that the household is unable to cope with the HIV/AIDS burden more in urban areas than in rural areas.

- This finding is consistent with the findings in Chapter 4 of this document.

8.6 Recommendation

- The results show that government support has a significant impact in lessening the severity of HIV/AIDS in the rural areas than in urban areas. The support of government to the rural household is commendable.
- However, there is need for government to extend the support to urban areas as this might also lessen the severity of HIV/AIDS in urban areas.

Chapter 9

Conclusion

9.1 Main conclusions

This report presented some insights into the interlinkages between food and nutrition security and HIV/AIDS in Zimbabwe. The findings are summarised under each chapter of this report. Overall, the main findings from the study are as follows:

(i) At least 13.6% of the households surveyed had at least one person in the household who was HIV positive
(ii) There were more affected households in rural areas than urban areas.
(iii) HIV/AIDS affected households were more food insecure than unaffected households.
(iv) No statistically significant difference in the WASH of the affected versus unaffected households
(v) HIV/AIDS affected households were in more hunger than unaffected households.
(vi) Government's support reduced the severity of food insecurity more for affected households in rural areas than those in urban areas.

9.2 Recommendations for further research

The findings reveal some gaps in the following areas:

(i) The analysis was conducted at household level as there is no identifier or code for the specific HIV positive individual.
(ii) There is need to get in-depth insights by answering the WHY questions as to the observed trends and patterns, for example:
    - Why HIV/AIDS affected households located in the rural areas are more able to cope but not able to recover from stress and shocks as compared to their urban area counterparts?
(iii) We strongly recommend some case studies to be conducted in a few clinics, affected households and HIV/AIDS known hotspots to answer the WHY questions emanating from the results of this secondary data analysis.

- Such case studies will give in-depth insights and in-depth understanding into the possible factors influencing impact, coping and recovering ability by the HIV/AIDS affected households.
- More so, there is need for further research on access to health facilities and availability of drugs in the health facilities.
- Such information is key to develop appropriate intervention strategies and development of effective policy.

(iv) There is need to get in-depth insights as to the lack of statistically significant difference between breastfeeding and non-breastfeeding women in HIV/AIDS affected and unaffected households. For more conclusive results, there is need to identify the HIV positive individual as this will give more insights into the impact of HIV/AIDS on child nutrition.

(v) Overall, there is need for more research or data analysis on the impact of the different intervention programmes being implemented in the country on food security and coping ability of the HIV/AIDS affected households to the various shocks and stressors.

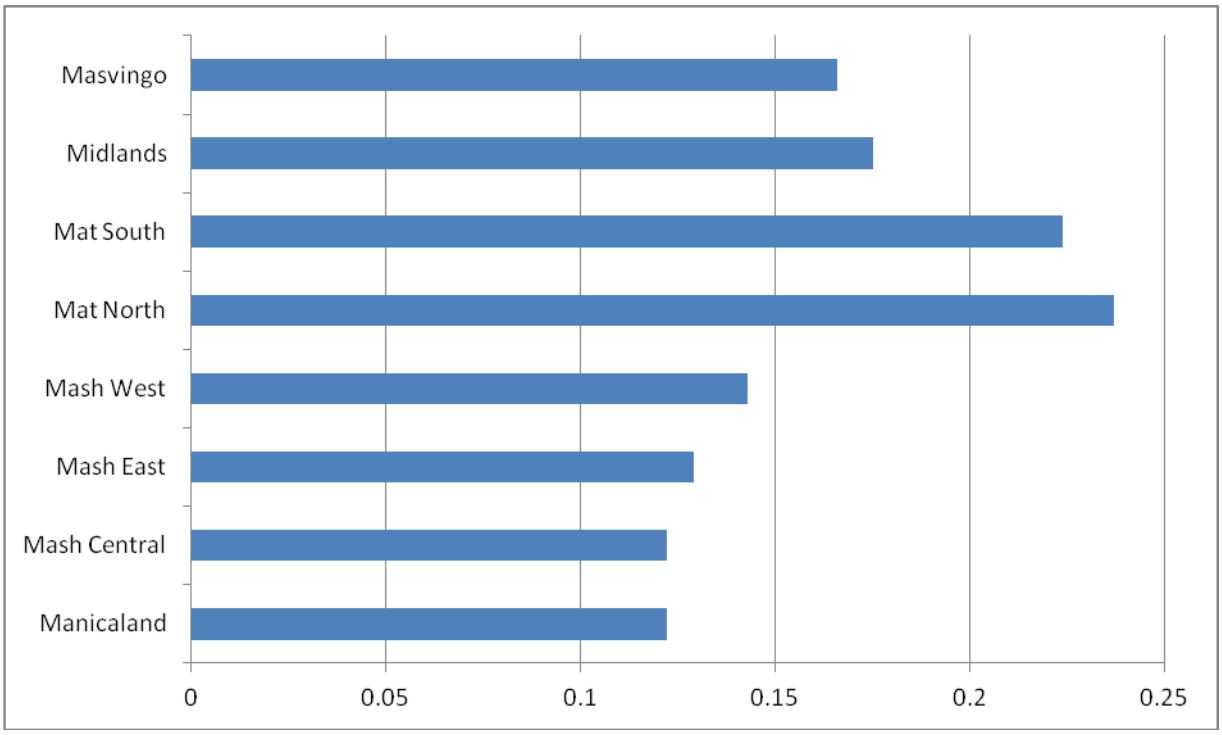
9.3 Recommendations on improving the data collection tool

Some of the recommendations and areas of further research highlighted in the summary section of each chapter and also in this chapter can be addressed by improving the data collection tool. It is recommended to include a separate section on HIV in the ZimVAC tool with questions that capture the following information:

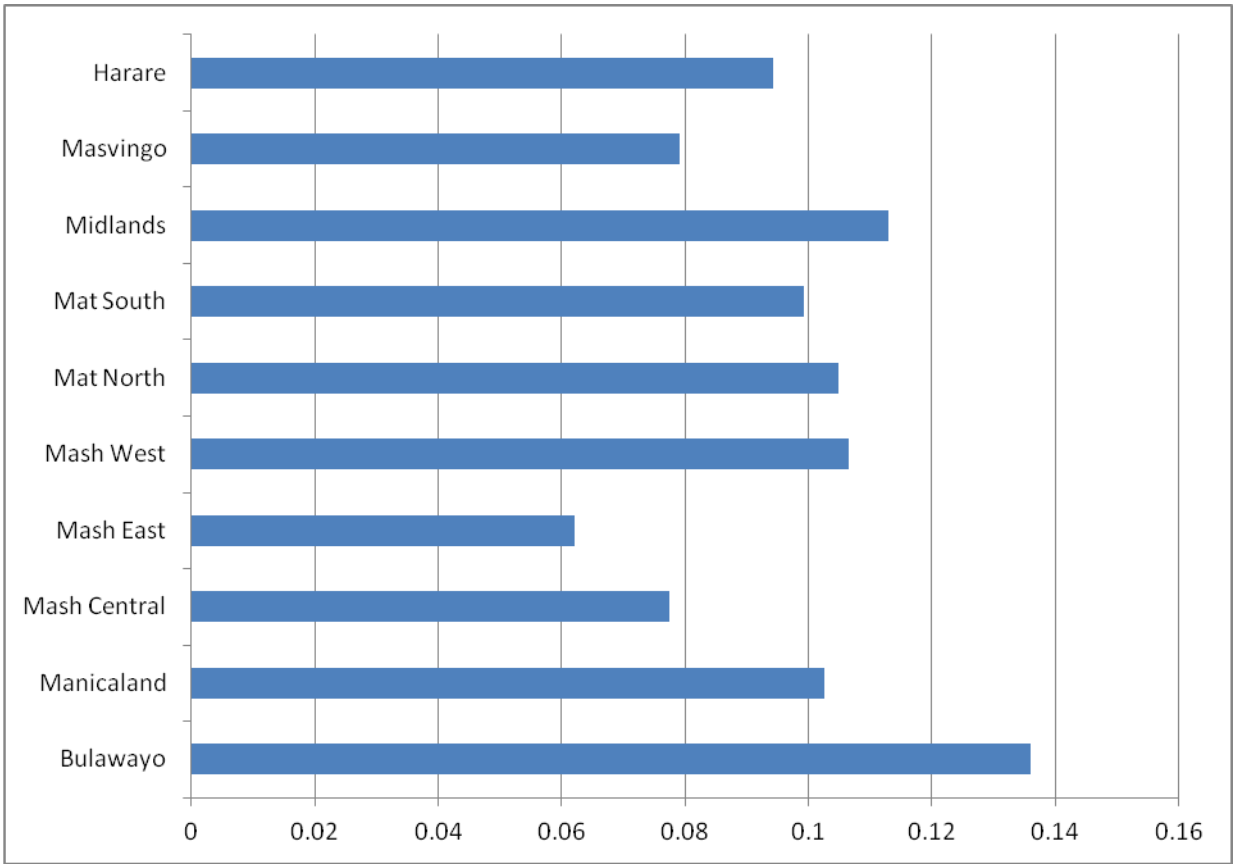
vii. *if possible,* gender and age group of the affected individual(s) within the household. This enables analysis at individual level;
viii. access to health and counselling services;
ix. availability of medicines at the nearest health facility;
x. availability of medical personnel at the nearest health facility;
xi. access to information and education on HIV/AIDs;
xii. number of HIV/AIDs related deaths in the household.

Adding questions that provide the above information will enable in-depth analysis of the interlinkages between HIV/AIDS and food and nutrition security in Zimbabwe.

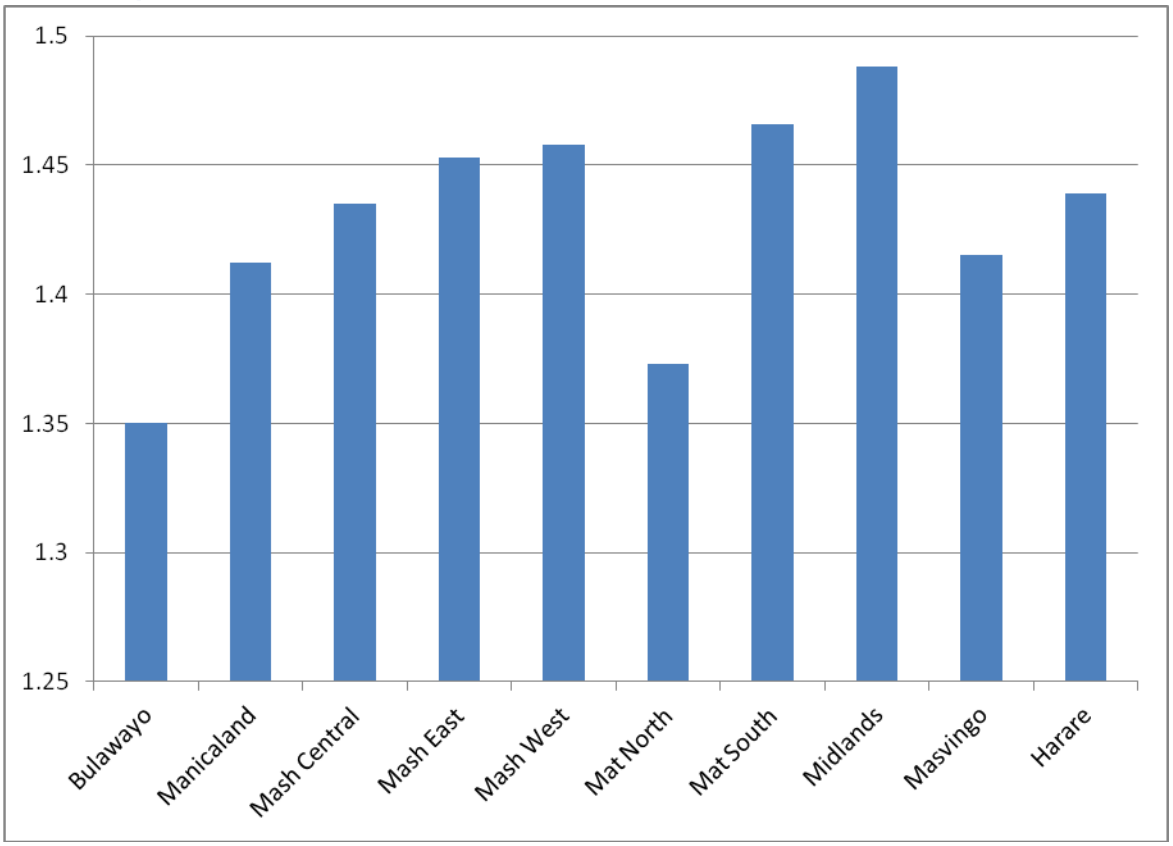
Annex 1. Rural provincial disaggregation of the proportion of households affected by HIV



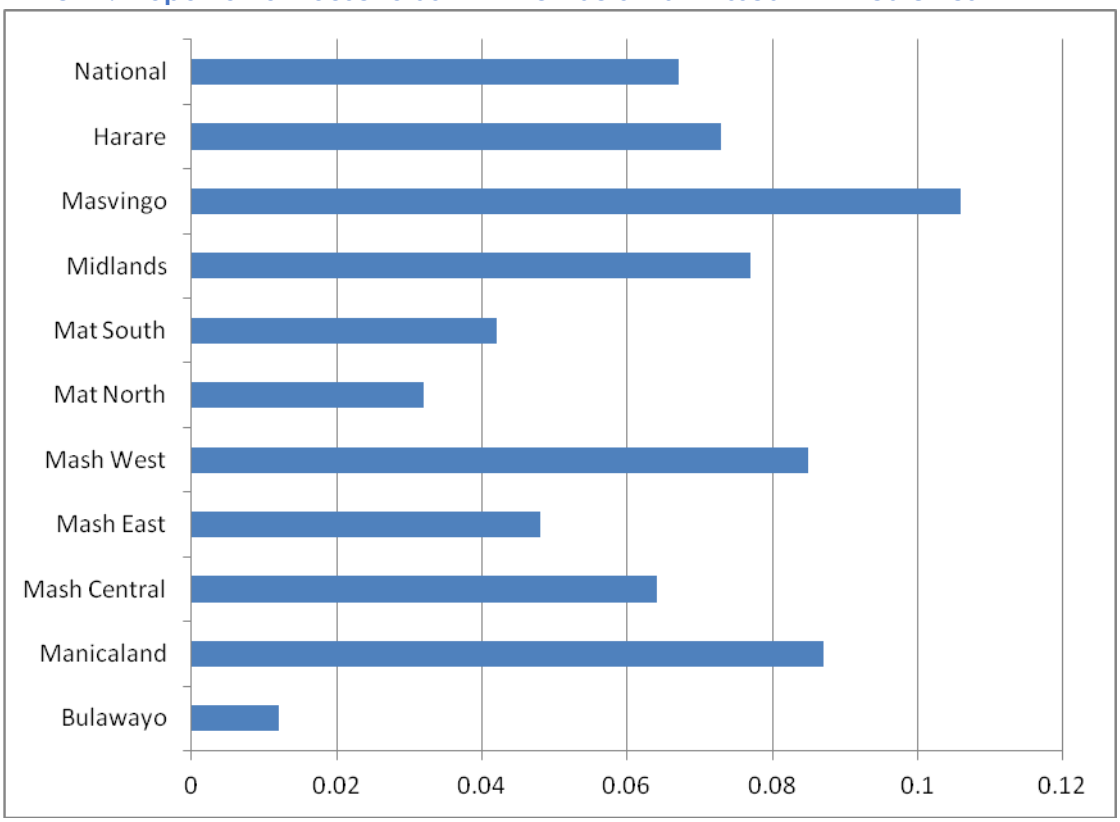
Annex 2. Urban provincial disaggregation of the proportion of households affected by HIV



Annex 3. Urban provincial disaggregation of the average number of household members infected by HIV



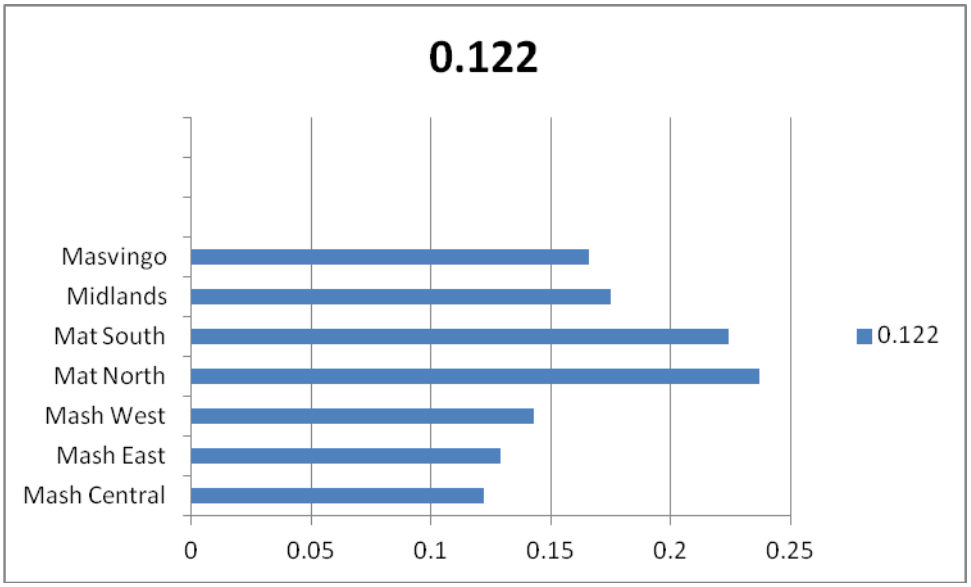
Annex 4. Proportion of households with members that missed HIV medicines



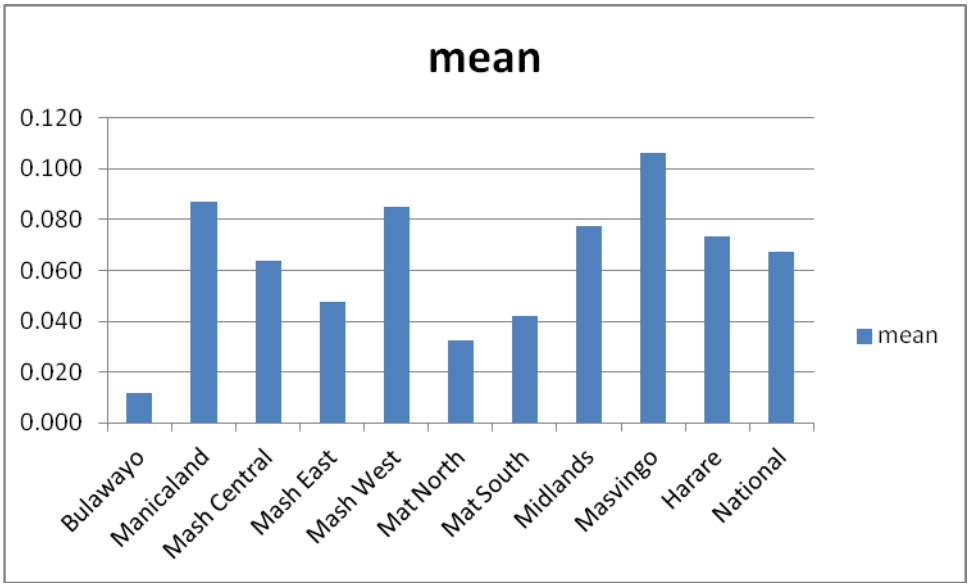
Annex 5. Rural decomposition

	Manicaland	Mash Central	Mash East	Mash West	Mat North	Mat South	Midlands
Mash Cen	0.000						
	1.000						
Mash East	0.007	0.007					
	1.000	1.000					
Mash West	0.021	0.021	0.014				
	1.000	1.000	1.000				
Mat North	0.114	0.115	0.107	0.093			
	0.000	0.000	0.000	0.000			
Mat South	0.102	0.102	0.095	0.081	-0.013		
	0.000	0.000	0.000	0.000	1.000		
Midlands	0.053	0.053	0.046	0.032	-0.061	-0.049	
	0.000	0.000	0.001	0.226	0.000	0.001	
Masvingo	0.044	0.044	0.037	0.023	-0.070	-0.058	-0.009
	0.014	0.007	0.048	1.000	0.000	0.000	1.000

Annex 6. Proportion of urban households affected by HIV/AIDS



Annex 7. Medicines



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