

# What is the Community of Angorom in Busia County Doing About Modifiable Risk Factors for Non-Communicable Diseases?

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## Abstract

### Introduction

We contacted this study to identify what the community in Angorom ward of Busia County is doing about modifiable factors (tobacco use; inactivity; diet- types of foods eaten;) for the prevention of Non-communicable diseases and to determine the prevalence of hypertension and Diabetes.

### Materials & Methods

We conducted this study to generate critical information which was not available but was needed for formulation of evidence-based prevention and control policies and programmes for non-communicable diseases. A cross sectional research design which enabled the collection of data from different respondents at a single point in time was chosen for this study. We used document analysis, interview guides and key informant interviews to collect the data. The study population is approximately 10,337 from which we systematically sampled 102 heads of households from lists of households in the three Community Health Units in Angorom ward. We used SPSS programme for analyzing quantitative data and descriptive statistics to describe the basic features of the data. We analyzed Qualitative data using thematic analysis and emerging themes distilled and presented in text format.

### Results

We found that 19.4 % of household heads reported use of tobacco by a member/s of their households aged 36 years above. Youth aged 13- 18 were not initiated to tobacco smoking.

The foods eaten in the study households were high in carbohydrates and lacking in protective foods (fruits and vegetables) and in animal proteins (beef, chicken, fish) and plant proteins (beans, peas, green grams).

We found the prevalence of cardiovascular diseases (hypertension) to be 19.4% and (Diabetes) at 9.4% The level of inactivity in the study area is high but some activities such as digging, planting and harvesting was difficult to measure and quantify as per the WHO standards.

### Conclusion & Recommendations

Based on the surprise result that youth aged 13-18 years were not initiated to tobacco smoking, we concluded that there is need to nurture and sustain this trend by the community, county governments and stakeholders working within the youth sector. We also concluded that the finding seems at odds with the popular youth culture and calls for further research.

We established that the diet in Angorom ward is high in carbohydrates (ugali, chapatti, rice) and deficient in protective foods (vegetables and fruits) as well as in animal (beef, chicken, fish) and plant (beans, green grams). We recommend that the county government enhances field extension services to farmers to increase animal and crop production as well as launch sustained nutrition education programs. We concluded that the prevalence of cardiovascular diseases (hypertension and Diabetes) is of concern and calls for urgent measures especially screening for non-communicable diseases to enable early identification, management and establishing health promotion interventions by the county government.

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## 1. Introduction

According to the Pan American Health Organization (PAHO) and the World Health Organization (WHO), modifiable risk factors for non-communicable diseases (NCDs) are tobacco use, physical inactivity, the harmful use of alcohol, unhealthy diets and biological risk factors including overweight, obesity, raised blood pressure and raised blood glucose that all increase the risk of dying from NCDs. The two organizations argue that detection, screening and treatment of NCDs as well as palliative care are key elements of the response to NCDs [1].

According to the Division of Global Health Protection and Security of the Centre for Disease Control (CDC), tobacco use is the leading cause of preventable deaths in the world killing up to half the people that use it [2]. Each year, tobacco use kills 8 million people – including 1.2 million non-smokers exposed to secondhand smoke. Tobacco use is a major risk factor for non-communicable diseases such as chronic respiratory diseases, cancer, diabetes, heart disease, and stroke as well as a factor for some communicable diseases such as tuberculosis and HIV/AIDS [2]. Nearly 8 in 10 of the world's 1.3 billion who use tobacco live in low- and middle-income countries (LMICs), where the burden from tobacco-related death and disease is greatest. Tobacco use contributes to increased health care costs, strained health care systems, and reduced worker productivity.

The NCD Alliance has argued that physical inactivity is a key risk factor for non-communicable diseases, and the fourth leading cause of early death globally [3]. Recent estimates show that approximately 31% of the world's population does not get enough physical activity to protect their health. The World Health Organization recommends that adults should get the equivalent of two and a half hours of moderate-to-vigorous physical activity each week [4]. Children should get even more, at least one hour a day. Walking, cycling, swimming, sports, and active recreation and play are all ways to be active, but there are many more. Physical inactivity is a concern globally, but levels are the highest in high-income countries. The prevalence of physical inactivity in high-income countries in 2016 was 36.8%, more than double the prevalence in low-income countries, at 16.2%. The health benefits of physical activity are well established and include a lower risk of noncommunicable diseases including cardiovascular disease, hypertension, diabetes, and breast and colon cancer [3].

The World Health Organization reports that Alcohol consumption is a causal factor in more than 200 diseases, injuries and other health conditions [4]. Drinking alcohol is associated with a risk of developing health problems such as mental and behavioural disorders, including alcohol dependence, and major noncommunicable diseases such as liver cirrhosis, some cancers and cardiovascular diseases. A significant proportion of the disease burden attributable to alcohol consumption arises from unintentional and intentional injuries, including those due to road traffic crashes, violence, and suicide. Fatal alcohol-related injuries tend to occur in relatively younger age groups [4]. Furthermore, the NCD Alliance has argued that Alcohol use is one of the major risk factors for noncommunicable diseases

(NCDs) [5]. More than half of all alcohol-related deaths (1.7 million) are due to an NCD. Despite its relatively widespread social acceptance, alcohol is a toxic, psychoactive, carcinogenic, and dependence-producing substance capable of causing severe damage to health.

UNICEF has stated that the food we eat has a large impact on our health. An unhealthy diet, typically high in sugar, saturated fat, and salt and low in vegetables and fruits, can contribute to the development of non-communicable diseases (NCDs) [6]. Examples of NCDs are diabetes, hypertension, heart disease and cancer. These diseases are highly prevalent in South Africa and as a disease group, have become the largest killer in the country. UNICEF argues that one of the things you can do to reduce the risk of developing NCDs is to eat a nutritious diet, ensuring that you include enough vegetables and fruits [6]. The more processed foods are in your diet, the farther away they are from their natural state and are more likely to contain added ingredients that in the long run may be harmful to your health.

According to the World Health Organization, the unhealthy risk behaviors of tobacco use, unhealthy diets, physical inactivity and harmful use of alcohol lead to key metabolic/biological changes that increase the risk of NCDs, i.e. raised blood pressure, overweight/obesity, high blood glucose levels/diabetes, and hyperlipidemia (high levels of fat in the blood) [7].

In Sub-Saharan Africa, Africa CDC observes that although the focus of public health policymakers is overwhelmingly on communicable diseases, premature deaths and disability from NCDs and mental health conditions, and their overall share of the disease burden, is increasing rapidly. The burden of non-communicable diseases (NCDs) in sub-Saharan Africa alone grew by 67% between 1990 and 2017 (measured as disability adjusted life years – DALYs) reflecting a significant rise in the proportion of total DALYs attributable to NCDs from 18% to 30% [8]. The burden of NCDs among African Union Member States is higher than the global average.

Sub-Saharan Africa also suffers from a significant burden of injuries [8]. This has led to the postulation that Africa has a triple burden of communicable and NCDs as well as injuries. The NCDs mostly responsible for the increase in the burden of disease in Africa include mental health conditions, cardiovascular diseases and neoplasia. The rise of NCDs & injuries and mental health conditions are projected to accelerate: they are estimated to cause more premature deaths on the continent than all other conditions combined by 2030 and, by far, most death and disability by 2063. NCDs & injuries and mental health should no longer be neglected in Africa and must be prioritized on health and development agendas especially by continental, regional and national public health institutes [8].

Kenya like most developing countries is facing a double burden of communicable and non-communicable diseases [9]. NCDs accounts for more than 50 percent of total hospital admissions and over 55 percent of hospital deaths. The National NCD Prevention and Control Strategy 2015-2020 aims to reduce the

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preventable burden of morbidity, mortality and disability due to non-communicable diseases through multi-sectoral collaboration at the national and county levels, with a view to ensure the highest attainable standards of health and productivity throughout the life cycle for sustainable socioeconomic development [9]. The main non-communicable diseases in Kenya include cancers, diabetes, cardiovascular diseases, chronic obstructive pulmonary diseases and mental disorders.

The four major preventable causes of non-communicable diseases in Kenya include; tobacco use and exposure, unhealthy diet, physical inactivity and harmful use of alcohol. Thirteen percent (13%) of Kenyans consume some form of tobacco products, with a significantly higher prevalence among men (23%) than women (4.1%) [9].

According to the National Council for Population and Development, Physical inactivity is recognized as an important risk factor for multiple causes of death and chronic morbidity and disability [9]. Overall 6.5 percent of Kenyans do not engage in the recommended amount of physical activity. WHO recommends that adults aged 18-64 years should do at least 150 minutes of moderate-intensity physical activity throughout the week, or do at least 75 minutes of vigorous-intensity physical activity throughout the week.

Kenya is increasingly faced with unhealthy diet-related non-communicable diseases, especially trans and saturated fats and salt but low in fruits and vegetables. WHO recommends at least five servings of fruits and vegetables a day [4]. Studies show that 94 percent of Kenyans are consuming less than 5 servings of fruits and vegetables per day [9]. More than half Kenyans use the recommended vegetable oil (59.1%) while 38.5 percent use the non-recommended vegetable fats [9].

Twenty seven percent (27%) of Kenyans are either overweight or obese, with the percentage being significantly higher in women (38.5%) than men (17.5%). Kenyans living in urban settlements are obese (12%), compared with (7%) rural dwellers. Regarding the harmful use of alcohol, approximately 19.3% of Kenyans currently drinks alcohol with 13% of this consuming alcohol on a daily basis. In more recent years the role of alcohol in non-communicable diseases, such as heart disease, liver cirrhosis and cancer, is increasing across the world.

In Busia County, senior department of health officials and a principal Investigator of a research project on NCDs have reported that NCDs account for 17% of illness affecting residents [10]. Research conducted in the county shows that over 25% of adults are hypertensive, 3.7% were diabetic with only 20% on treatment. The research further showed that 8% of adults between 25 and 40 years were at pre-diabetic and pre-hypertensive.

Amid the rising number of people with non-communicable diseases (NCDs), Kenya has invested in strengthening primary care and in efforts to expand existing service delivery platforms to integrate NCD care. One such approach is the AMPATH

(Academic Model Providing Access to Healthcare) model in western Kenya, which provides the platform for the Primary Health Integrated Care Project for Chronic Conditions (PIC4C), launched in 2018 to further strengthen primary care services for the prevention and control of hypertension, diabetes, breast and cervical cancer in Trans-Nzoia and Busia counties [10].

## 2. Problem Statement

A review of the limited literature reveals that there is little documentation of how the ordinary community members are engaging with preventable risk factors for NCDs. The limited literature tends to focus on the health care workers, patients and heads of households with NCD cases [10].

There is therefore a dire need for information on what ordinary community members are doing to address the preventable risk factors for NCDs in Busia County. This remains a critical gap in knowledge that is imperative in expanding the existing knowledge base and in formulating comprehensive and targeted interventions against the NCDs.

## 3. Justification

This study has generated critical and important information about what community members are doing to reduce the main modifiable risk factors for NCDs, namely tobacco use; unhealthy diets, physical inactivity and harmful use alcohol.

The results of the study have likely contributed to the expansion of knowledge and to the formulation of evidence-based prevention and control policies and strategies for NCDs.

## 4. Purpose

The Purpose of this study is to contribute to the expansion of knowledge, enablement of the local communities to reduce the main modifiable risk factors for NCDs in Busia County.

## 5. Research Questions

- What are community members in Angorom ward doing about modifiable risk factors (tobacco use, physical inactivity, harmful use of alcohol and unhealthy diets) for non-communicable diseases?
- What foods do the community members in Angorom ward eat for breakfast, lunch and supper from Monday to Sunday?
- What is the prevalence of diseases associated with the risk factors (high blood pressure-hypertension, high blood sugar – Diabetes, obesity and overweight in the Angorom ward?

## 6. Research Objectives

- To assess the prevalence of tobacco, use and the age structure of the users
- What type of exercises are done by members of the community in Angoromo ward and why
- To identify the types of foods eaten by the community members for breakfast; lunch and supper during the week (Monday to Sunday).
- To determine the prevalence of non-communicable diseases associated with the modifiable risk factors among the residents of Angorom ward.

## 7. Research Design and Methodology

The research design and methodology draw closely from a recent study by the Author, during which time, data for this study was collected by not analyzed, disseminated and published [11].

## 8. Study Design

A cross-sectional descriptive and analytical study design which enabled collection of data from different respondents at a single point in time was chosen for this study.

## 9. Study Site

The study was conducted in Angorom ward of Angorom location, Teso South Sub-County in Busia County.

## 10. Study Population

The study covered approximately 10,337 residents of Angorom ward and the health care workers who serve the community from Alupe hospital

## 11. Sample Size

A systematic sample of 102 households was chosen from lists of households in each of the three community units in Angorom ward. From the Alupe hospital, the Sub-County Health Management Team members were involved in the study.

## 12. Eligibility and Exclusion Criteria

All residents of Angorom Community Unit willing to participate in the study were eligible. However, non-residents of the Community Unit were excluded. Similarly, health and development workers who neither worked in Angorom community unit nor are members of the Sub-County Health Management Team were excluded from this study.

## 13. Data Management

### 13.1 Data Collection

Document analysis, interview guides and key informant interview guides were used to collect data.

## 14. Data Analysis and Presentation

Descriptive statistics were used to describe the basic features of the data. Simple summaries of the sample and the measures of study variables are presented through tables and graphs. Qualitative data was analyzed using thematic analysis and

emerging themes distilled and presented in text format.

## 15. Ethical Considerations

The study proposal was submitted to the Alupe University Institutional Scientific Ethics Review Committee (ISERC) for review and approval. An application for a research license was submitted to NACOSTI and license issued. Clearance was sought and granted from the Department of Health and Sanitation, County Government of Busia to conduct the study.

## 16. Study Limitation

The study was funded by Alupe University with very limited seed funds, consequently both the scope and breath of the study is considerably constricted. The second limitation was that the study team came across instances of missing documents or incomplete records such as diagnosis reports from the health facilities.

## 17. Management of the Research Process

The Principal Investigator took the overall responsibility over the smooth implementation of the research project. He was assisted by the co-research investigator.

Officials of the Department of Health and Sanitation and the Community Health Volunteers (CHVs) played key roles in organizing and coordinating training and research activities and ensuring a conducive study environment.

## 18. Results

The community study sought to assess the socio-demographic characteristics of the respondents; prevalence of tobacco use; level of inactivity; types of foods eaten; and to determine the prevalence of non-communicable diseases associated with preventable risk factors among the residents of Angorom ward. Findings on each of these broad variables are presented in the paragraphs that follow.

## 19. Sociodemographic Characterizes of Study Population

Findings of the sociodemographic characteristics of the study population are as follows;

**Age:** Most of the respondents were above fifty-one years (25.2%). Table 1 below shows the age structure of the study population.

Age range	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-25	4	3.9	3.9
	26-30	12	11.7	15.5
	31-35	13	12.6	28.2
	36-40	14	13.6	41.7
	41-45	18	17.5	59.2
	46-50	16	15.5	74.8
	51 +	26	25.2	100.0
Total	103	100.0	100.0	

Table 1: Age Structure of The Study Respondents

**Sex:** Seventy-nine point six (79.6%) of the population were female while only twenty-point four percent (20.4%) were males.

twelve point six (12.6%) were widowed while three point nine (3.9%) were single. Six point eight (6.8) of the respondents were separated. The table below summarizes the marital status of the study population.

### 20. Marital Status

Majority of the study respondents were married (75.7%),

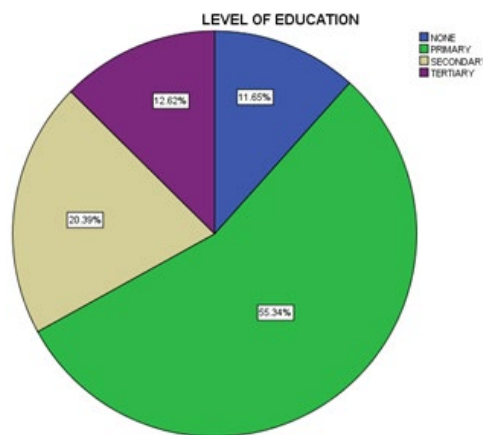
Marital Status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SINGLE	4	3.9	3.9	3.9
	MARRIED	78	75.7	75.7	79.6
	DIVORSED	1	1.0	1.0	80.6
	SEPARATED	7	6.8	6.8	87.4
	WIDOWED	13	12.6	12.6	100.0
	Total	103	100.0	100.0	

**Table 2: Marital Status of Study Population**

### 21. Level of Education

In terms of education, most respondents (55.3%) had primary level of education; twenty point four (20.4) had secondary level of education and twelve point six (12.6%) of the study

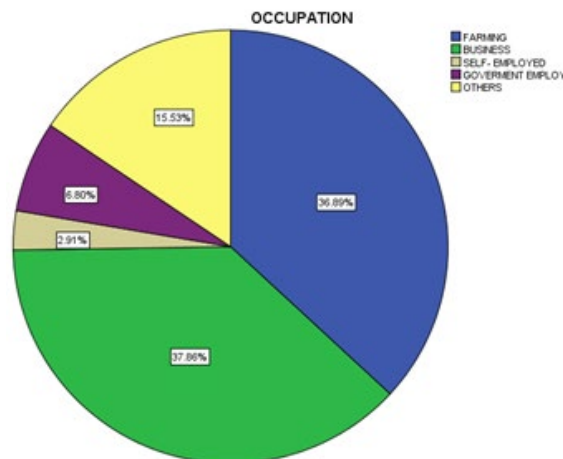
population had attained tertiary level of education. The study found that eleven point seven (11.7%) of the study population had no formal education. The pie chart below summarizes the education levels of the study population.



### 22. Occupation

In relation to the occupation of the study respondents, thirty-seven point nine (37.9%) were involved in small and microbusiness enterprises; thirty-six point nine (36.9%) involved in peasant

farming; six point seven (6.7%) were government employees while two point nine (2.9%) were self-employed. This is presented in the pie chart below.



### 23. Tobacco Use

Asked whether they or members of their households smoked tobacco, 80.6% of respondents said no while 19.4% reported that a member of the household smokes tobacco.

Probed further about the age of the household member who smoked, they responded as shown in the table below:

Age of smoker		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N/A	83	80.6	80.6	80.6
	36 +	12	11.7	11.7	92.2
	30-35 YEARS	6	5.8	5.8	98.1
	19-24 YEARS	1	1.0	1.0	99.0
	13-18 YEARS	1	1.0	1.0	100.0
	Total	103	100.0	100.0	

**Table 3: If Yes, How Old is the Individual Who Smoke**

### 24. Level of Inactivity

Due to the contribution of sedentary life to non-communicable diseases, the study sought to know the exercises done in Angoromo ward. When respondents were asked if they and members of their households engaged in any physical exercises, 57.3% responded in the negative while 42.7% responded in the affirmative.

### 25. Diet – Types of Foods Eaten

Due to the critical role of food as an underlying cause of non-communicable diseases, Respondents were asked to provide information on the types of food they ate during the week (Monday to Sunday) preceding the study. These included foods eaten for Breakfast, lunch and supper. Table below summarizes the information gathered from the respondents.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Tea	78	77	81	75	76	79	90
Mandazi	30	16	18	21	15	15	19
Bread	26	28	18	22	21	22	21
Nduma	1	2	3	1	1	1	1
Banana	1	0	2	1	0	0	1
Potatoes	2	2	2	2	1	4	4
Chapati	5	3	6	5	4	4	1
Githeri	8	3	5	2	4	2	3
Porridge	15	17	13	12	13	14	6
Cassava	1	1	0	1	4	1	1
Maize	3	0	1	0	1	1	0
Rice	0	4	0	0	0	0	0
Sambusa	0	0	4	0	0	0	0

**Table 4: Foods Eaten for Breakfast**

It's evident from the above data that the breakfast eaten by the respondents and their households is lacking in protective foods, namely vegetables and fruits. Similarly, their breakfast is highly deficient in both plant and animal proteins.

### 26. Foods Eaten for Lunch

The classes eaten by respondents and members of their households for lunch were investigated in this study. Table below shows their responses.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Ugali	62	56	50	56	52	48	54
Vegetables	46	34	28	39	33	29	33
Omena	4	8	8	8	9	7	9
Tea	10	8	12	12	12	15	12
Rice	10	9	12	11	11	15	14
Potatoes	3	2	2	2	5	1	2
Beans	9	5	3	4	3	8	9
Green grams	1	2	4	3	3	3	0
Banana	1	3	2	2	5	1	2
Nduma	3	0	2	0	1	1	0
Githeri	1	2	2	4	2	5	2
Fish	4	2	4	0	0	0	2
Beef	3	0	2	3	2	5	2
Chapati	5	1	5	3	4	2	3
Porridge	0	8	5	4	6	3	3
Eggs	0	1	0	0	0	1	1
Fruits	0	0	0	1	0	0	0
Bread	0	0	0	2	0	3	0

**Table 5: Foods Eaten for Lunch**

Based on the data presented in the above table, three issues can be said about the lunch eaten by the respondents:

- That the lunch is rich in carbohydrates, Ugali seems to be favorite food during lunch.
- That lunch lacks protective foods, namely fruits, vegetables and mineral salts
- The foods eaten for lunch lack essential animal and plant proteins

• It was however reported by some respondents that porridge eaten during breakfast was reserved and eaten during lunch hours.

### 27. Foods Eaten for Supper

The type/classes of foods consumed during the evening meal or supper was assessed among the respondents. The table below shows their responses.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Ugali	91	94	85	89	86	82	82
Vegetables	55	55	47	49	49	46	52
Omena	13	9	12	17	15	11	15
Beef	4	10	5	5	6	9	5
Fish	11	11	13	12	8	9	6
Beans	6	5	11	4	8	11	9
Potatoes	1	3	2	1	1	0	0
Chapati	1	1	5	3	7	3	8
Rice	5	4	8	5	4	14	4
Eggs	4	1	1	0	1	0	0
Tea	2	2	4	5	3	3	5
Banana	2	0	0	2	0	0	0
Fruits	0	2	0	0	0	0	0
Githeri	0	0	1	1	1	1	4
Chicken	0	0	0	0	1	0	0

**Table 6: Foods Eaten for Supper**

Based on the data presented in the above table, the following issues are apparent about the evening meals or supper eaten by the respondents:

- Ugali (Maize meal) is the staple carbohydrate of choice eaten by a majority of respondents, 91 out of 102 or 89% of households. The other types of carbohydrates eaten in the area are rice, potatoes, chapatti and bread.
- Vegetables, a regular companion of Ugali is consumed by only about 50% of the respondents during their supper or evening meals
- The foods eaten for supper or evening meals lack essential animal proteins. For example, on Monday preceding the study, only 32 out of 102 households or 31% of the households ate animal proteins (Beef, silver Cyprinid (omena), fish and eggs).
- Similarly, foods eaten for supper or evening meals are deficient in essential plant proteins. For example, on Monday preceding

the study, only 10 out of 102 or 10% of the households ate plant proteins, mainly beans and green grams.

### 28. Prevalence of Diseases Associated with Risk Factors for NCDS

Due to both demographic and epidemiological transitions, non-communicable diseases have become one the main challenges in the public health sector. In this study, cardiovascular disease - hypertension or raised blood pressure (HTN); raised blood glucose (diabetes); tobacco use and alcohol consumption was investigated. The findings are presented as follows:

### 29. Prevention of Cardiovascular Disease

Study respondents were asked if they or a member of the household has ever been diagnosed with raised blood pressure. Their responses are shown below:

Responses	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	82	79.6	79.6
	YES	20	19.4	99.0
	NOT TESTED	1	1.0	100.0
	Total	103	100.0	100.0

**Table 7: Member of Household Ever Been Diagnosed with HTN**

Majority 79.6% responded in the negative while 19.4% responded in the affirmative.

Respondents who reported to have high blood pressure were further asked what action they had taken. A summary of their responses is provided below

Actions Taken	Frequency	Percent	Valid Percent	Cumulative Percent	Cumulative Percent
Valid	N/A	81	78.6	78.6	78.6
	TAKING MEDICINE	17	16.5	16.5	95.1
	SUGAR AND SALT FREE FOODS	3	2.9	2.9	98.1
	PRESCRIBED DIET	1	1.0	1.0	99.0
	NOTHING	1	1.0	1.0	100.0
	Total	103	100.0	100.0	

**Table 8: Action Taken Once Diagnosed with Raised Blood Pressure**

Most of the respondents who had cases of HTN in their household reported taking medicines and eating sugar and salt free foods.

87.4% said no while 9.7% said yes; 1% said he had not been tested.

### 30. Management of Diabetes

Respondents were asked if they or a member of their household has ever been diagnosed with raised blood glucose (Diabetes).

When those who had responded in the affirmative were further asked what action they had taken, they responded as follows:

Actions taken	Frequency	Percent	Valid Percent	Cumulative Percent	Cumulative Percent
Valid	N/A	81	78.6	78.6	78.6
	TAKING MEDICINE	17	16.5	16.5	95.1
	SUGAR AND SALT FREE FOODS	3	2.9	2.9	98.1
	PRESCRIBED DIET	1	1.0	1.0	99.0
	NOTHING	1	1.0	1.0	100.0
Total	103	100.0	100.0		

**Table 9: Action Taken Once Diagnosed with Raised Blood Glucose**



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## 31. Discussion and Conclusions

### 31.1 Tobacco Use

It is clear that majority of the smoking population in Angorom ward are adults 36 years and above at 11.7% which compares favorably with the study done by the Tobacco Control Board<sup>12</sup> that found tobacco use among adults in four counties (Nairobi, Kisumu, Nakuru, and Mombasa) stood at 11%.

However, among out of school youth between the ages 19-35 years in Angorom ward, the prevalence of tobacco use stood at 6.8%, significantly lower than the 36% among youth in institutions of higher learning as reported by the Tobacco Control Board<sup>12</sup>. The possible reasons for this variance may be due to the levels of exposure, youth in Angorom being rural, out of school whereas the comparable youth were from higher institutions of learning, urban cities and have access to alternative tobacco products which are smokeless and attractive. It is worth noting that the youth at critical ages of 13-18 years in the study area seem not to be in the habit of smoking. This finding seems to be at odds with the popular youth culture, peer influence and societal trends relating to tobacco use. This raises a number of theoretical and practical questions that needs to be investigated.

### 32. Level of Inactivity

Both groups of respondents argued that although they did not go out to designated recreational facilities for exercises, the nature of their occupation, namely farming and small, medium and micro business ventures engaged them in a lot of physical exercises. For example, digging, planting, harvesting etc. While for the business group, they reported that they walked an average of 4 kms to the various centers where they do their business or to where they collect their business merchandise.

From the above findings, it seems that majority of the respondents (57.3%) met the WHO criteria that recommends that adults should get the equivalent of two and half hours of moderate-vigorous physical activity each week. However, of the 42.7% who responded in the negative, it's possible that they may have been involved in some physical activities that may not have been reported [4].

### 33. Diet: Types of Foods Eaten

Findings of this study that Protective foods namely vegetables and fruits are consumed in insufficient quantities and only by 50% of the respondents, are consistent with Kenyan trends. For example, the global Alliance for Improved Nutrition found that only 65% of Kenyans consume dark leafy vegetables, far below WHO's recommended daily intake of at least 400 grams per person or consumption of minimum servings of fruits and vegetables daily excluding starchy vegetables [12].

The finding of the study that most households (89%) ate ugali-carbohydrates on Monday, while only 31% ate animal and plant proteins on the same day pointing to insufficient consumption of essential proteins in the study population. This finding compares favorably with the study by Catarina et al that found that diet of adult Kenyan is high in sugars, salt and fibres with low animal

protein intake of 22% [13,14].

### 34. Cardio Vascular Diseases

From the data presented, few households reported members diagnosed with either hypertension (19.4%) or diabetes (9.7%). Compared to other recent studies, these results indicate a lower prevalence of hypertension (19.4%) against 25 % prevalence by a study conducted by AMPATH<sup>10</sup> in Busia and Trans-Nzoia counties in western Kenya and a national prevalence of 24% [15]. In contrast, the reported prevalence of Diabetes is higher at (9.7%) among respondents in this study compared to 3.7% in the Ampath study and a national prevalence of 3.3% [16].

It is apparent that appropriate action is taken by those diagnosed with either HTN or Diabetes as recommended by the health professionals.

### 35. Conclusion

- Tobacco uses in the general population
- Tobacco use in the general population in Angorom ward is slightly higher among adults but much lower among youth aged 13-18 years.
- Level of Inactivity –
  - In the study area, majority of the adult residents get the equivalent of two and half hours of moderate to vigorous physical activity each week. However, there are individuals involved in non-quantifiable physical activities such as digging, planting, harvesting among other activities that need to be accounted for in such studies.
  - Diet – the study has established the types of foods eaten for breakfast; lunch and supper in the study areas. It has established that the diet is high in carbohydrates and deficient in protective foods (vegetables and fruits) and in animal and plant proteins (meats, fish, beans and green grams)
  - Prevalence of Cardiovascular diseases
  - The prevalence of cardiovascular diseases in the study area is of concern despite most households had few members diagnosed with either HTN or diabetes. Furthermore, a relatively large number of respondents reported not to have been screened or tested for cardiovascular diseases.

### Recommendations

- Tobacco Use
  - The apparent lack of initiation of the adolescents aged 13-18 years into tobacco use in the study area is a positive outcome that requires nurturing and protection by the national and County Government of Busia, parents, teachers and all key stakeholders involved in youth affairs.
  - Further research is required to understand whether the rural context is protective against tobacco use by adolescents compared to the urban settings and to isolate these protective factors if any.
- 2. Inactivity
  - It is recommended that further research to quantify the level of activity associated with digging, planting and harvesting of foods in a rural setting and if such activities can recognize as meeting the standards set by the World Health Organization (WHO)

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### Diet – Types of Eaten

The Department of Agriculture and Livestock Development of the County Government of Busia should increase outreach services to local farmers in order to increase crop production as well as livestock in the area. Nutrition education should be enhanced in the area.

### Prevalence of Cardiovascular Diseases

The Department of Health and sanitation of the County Government of Busia should intensify screening for non-communicable diseases to enable early identification and early management of NCDs.

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