Trends and Patterns of Emerging Drugs in Kenya: A Case study in Mombasa and Nairobi Counties

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NOVEMBER, 2013

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ABBREVIATIONS

CDC	Centre for Disease Control
COPD	Chronic Obstructive Pulmonary Disease
EAPs	Employee Assistant Programmes
EDs	Emerging Drugs
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
FGDs	Focus Group Discussions
KU	Kenyatta University
IDUs	Intravenous Drug Users
MSSM	Modified Social Stress Model
NACADA	National Authority Campaign Against Alcohol and Drug Abuse
NCST	National Council of Science and Technology
NIDA	National Institute of Drug Abuse
PAHs	Polycyclic Aromatic Hydrocarbons
PSA	Programme on Substance Abuse
PPB	Pharmacy and Poisons Board
SPSS	Statistical Package for Social Sciences
TB	Tuberculosis
THC	Delta 9-tetra hydro Cannabinol
UNDCP	United Nations International Drug Control Programme
VOCs	Volatile Organic Compounds
WHO	World Health Organization

ACKNOWLEDGEMENT

We sincerely wish to acknowledge the Government of Kenya through Dr. Wiliam Okedi, the CEO, National Authority Campaign Against Alcohol Drug Abuse (NACADA) for availing the research funds and entrusting us with the project. Special thanks go to the research team comprising Mr. John Muturi, Mr. Morris Kamenderi and Mr. Mugambi Mwirichia who guided us through the research by providing the necessary infrastructure, discussion, guidance and the platform that made our research possible. We appreciate the Ethical committee of Kenyatta University (KU) and the National Council for Science and Technology (NCST) for research approval, the Research Assistants (RAs) who assisted in data collection and connected us to the respondents sometimes under difficult circumstances. The research would not have been possible without the consent from the administration officers in the respective Counties and Districts, all the respondents for their time and cooperation, we sincerely appreciate you. Special appreciation goes to the Key informants and the Focus Group Discussions (FGDs) for providing the backup information that made the research complete. Last but not least we highly appreciate Dr. Ibrahim Macharia for assisting in data analysis and Dr. Nicholas Korir for proof reading.

EXECUTIVE SUMMARY

Alcohol, tobacco, bhang, *miraa*, heroin, cocaine, methamphetamine (Meth), and ecstasy are some of the drugs commonly abused in Kenya. However, there are emerging drugs with hidden names and are consumed for unknown purposes. These emerging drugs are generally referred to as the legal high. The increasing popularity of emerging drugs across the country is presenting a growing challenge and their ability for sell in stores as unregulated substances presents a significant problem. Use of emerging drugs is becoming a major social problem among adolescents and young adults in Kenya. Although there is no evidence to suggest they are replacing the known injurious substances like heroin, cocaine and bhang as drugs of dependency, emerging drugs can seriously harm the physical and mental health of consumers. Emerging psychoactive substances are not controlled but are believed to cause similar or worse harm to those that are controlled. Many people particularly the youth take these drugs to get a 'high', without realizing the side effects. The rate at which these drugs are being developed is faster than they can be tracked. No information is available on the prevalence of and associations with emerging drug use among the vulnerable populations in Kenya.

This study sought to evaluate the trends and patterns of emerging drugs use, their magnitude, characteristics and their impact in Mombasa and Nairobi Counties of Kenya. The objective was to identify the policy gaps and interventions needed to minimize use of these drugs in Kenya. A total of 702 respondents participated in the study in Nairobi and Mombasa Counties. The social dynamics, types of drugs, age of initiation to drugs, source of drugs, where drugs are taken, introduction, their effects on respondents among other issues were investigated.

It was found that though most respondents started using the drugs at 21years (18%), the initiation age ranged from 5 to 28 years. Over 81% of users in both counties were introduced to drugs by friends followed by work mates. Forty one (41) emerging drugs were recorded with more in Nairobi than Mombasa County. These emerging drugs comprised combinations of two, three or four types of drugs. Most of the highly abused drugs were '*kuber, shisha, shashaman, mau, tambuu,* jet fuel, *kukumanga, mkorogo, mshomoro, rohypnol, Artaine* and *kamusi*. *Shisha* and *kuber* were the most abused emerging drugs with more men smoking shisha than women in both counties. A higher number of respondents took shisha in Mombasa than in Nairobi with over 25% of the respondents aged 26 to 35 years in both counties abusing both kuber and shisha. The users purchased drugs from various outlets, thus making it difficult to track.

The Intravenous Drug Users (IDUs) used heroin and cocaine and some even shared needles. Heroin was identified as the most frequently abused drug followed by cocaine in Nairobi and Mombasa County. Both sexes of 21-26 years were found to be injection drug users with Mombasa recording higher numbers than Nairobi. The percentage of individuals injecting heroin was 49.4% and 18% in Mombasa and Nairobi respectively, while those injecting cocaine was 25.9 % and 6.0 %, respectively. 21.9 % and 3.4 % of IDUs were found to inject both heroin and cocaine. A significant number of IDUs sharing needles on both heroin (22.5%) and cocaine (20.3%) was recorded in Mombasa, than Nairobi (5.6% and 5.5 %, respectively) over the past 12 months, placing the individuals at increased risk of contracting HIV/AIDS and Hepatitis C. Drugs were mainly consumed to get a 'high' or a 'long high' in the streets, dens, party and rarely at home and schools.

The respondents in both counties agreed that the emerging drugs had a lot of impact on the county security, economy, education, drop-out rate in schools, non-performance at the work place and reproductive health. Most respondents felt that establishment of treatment and rehabilitation centres would go a long way in solving the problems of drug addiction. Respondents strongly felt that the Government should set up of rehabilitation centres, start training programmes on ADA, establish Employee Assistant Programmes (EAPs), setup wellness centres, control selling of prescription drugs and even fixing stiff penalties on drug peddlers and banning of advertisement on media among others. In conclusion there is need for change in Policy to include the emerging drugs and reduce the number of deaths and illnesses associated with the emerging drugs.

CHAPTER ONE: INTRODUCTION

1.1 Background

The term "drugs of abuse" usually brings to mind traditional street drugs such as cocaine, heroin, marijuana, and methamphetamine (Stephen *et al*., 2011). The drug scene, however, is constantly evolving (Albert and Ostheimer, 2002). As various law enforcement agencies (Anti-Narcotics, Pharmacy and Poisons Board) pursue and dismantle distribution and production, organizations of the usual drugs of abuse, dealers and users are turning to less known, more accessible, and often currently licit substances. The widespread growth of the Internet with its vast distribution of information has increased the accessibility of a host of substances and facilitated synthesis and production of various substances by individuals (Evans-Brown *et al*., 2011).

The problem of drug abuse is slowly gaining momentum in major urban centres. It is presumed to have a high prevalence in Mombasa and Nairobi Counties because of their City Status. This presumption is buttressed by past anecdotal media accounts of widespread use and (suspected) serious adverse drug reactions. These had led many women and religious groups to publicly protest, asking for better enforcement of the laws against some of these drugs. The opportunity for rational debate and effective policy making has also been limited. Policy measures that reflect such errors may be regarded as disproportionate and illegitimate by sections of society that are the intended focus, which in turn could bring about unintended harmful consequences. A country-wide needs assessment study undertaken in 1994 by the Government of Kenya and the United Nations International Drug Control Programme (UNDCP) revealed that drug abuse has permeated all strata of Kenyan society, the youth and young adults being the most affected groups. New psychoactive substances pose a particular challenge to those formulating drugs' policy and related public health responses targeting these segments of the population **(**Bivins, 2008).

1.2 Problem statement and justification

While the government through the National Authority Campaign Against Alcohol and Drug Abuse (NACADA) has made some progress in addressing alcohol and other drugs, little has been done to address emerging drugs of abuse. These drugs are eating into the very core of our society i.e. the youth, who prefer them to the mainstream and often criminalized illicit drugs (Evans-Brown *et al*., 2011).

Research on emerging drugs situation in Kenya is non-existent. Subsequently the opportunity for rational debate and effective policy making is limited. The present study setting of Mombasa and Nairobi Counties is justified for the following reasons:

- Nairobi and Mombasa are ideal 'breeding grounds' for emerging drugs due to their demographics. Most emerging drugs are associated with affluence or class that goes hand in hand with urban life.

- Both counties have a cosmopolitan outlook that allows easy cross-pollination of ideas and cultures among different nationalities and races as well as ethnic groups.

- Nairobi and Mombasa counties are home to a number of tourist attraction sites such as Nairobi National Park and Fort-Jesus respectively whose influence on cultural confluence cannot be underestimated. The location is particularly important in precipitating drug trade.

- Mombasa is home to Kilindini Harbour, Kenya's largest sea port and is a link to the Middle East through the Indian Ocean. Nairobi on the other hand is a link to the rest of the Sub Saharan and North African Countries through the land locked 'pearl of Africa' i.e Uganda through Busia and Malaba boarders.

- Lastly, recent reports and media accounts have been highlighting coastal drug problems especially in Mombasa County terming them as drowning.

Some drugs are emerging as popular legal alternatives to alcohol, bhang, tobacco, *miraa*, heroin and cocaine among youths and young adults in Kenya. However, no data has been published assessing the trends, prevalence of and associations with the new emerging drugs in Kenya. This study aimed to examine the trends and prevalence of the emerging drugs among a sample of youths in Mombasa and Nairobi County, to determine characteristics of persons who use them, and to access the association with other commonly abused drugs.

1.3 General objective

The general objective was to determine the trends and patterns of emerging drugs use in Nairobi and Mombasa Counties in Kenya

1.4 Specific objectives

The specific objectives of the survey were to:

1. Assess the patterns/trends of emerging drugs and their use
2. Determine the socio-economic impacts of emerging drug use
3. Identify the existing policy gaps in management of emerging drugs and their usage
4. Identify strategies that can be put in place to address the problem of emerging drugs use

CHAPTER TWO: LITERATURE REVIEW

2.1 History and classification of drugs

The desire to change one's consciousness through the use of drugs is thought to be as old as humanity (Bashford and Levine, 2010). Indeed the desire to be beautiful, fitter or more intelligent has marked human endeavour since the beginning of civilisation (Haiken, 1999, Gilman, 2001; Hau, 2003; Zweiniger–Bargielowska, 2010). Magic, religion, diet, exercise, education and surgery have all played a part (Capitanio *et al.,* 1989). Drugs too have been at the heart of these attempts—some of our ancestors sipped drinkable gold *aurum potabile* to make themselves young again (Charlier *et al.,* 2009; Carden-Coyne, 2009). Others feasted on animal testicles to boost their strength and sexual prowess (Keyles, 1998; Hirshbein, 2000). Introspective Arab poets, meanwhile, chewed *khat* to stay awake for long periods, meditate on the soul and translate their experiences into poetry (Anderson *et al*., 2007).

Given the limitations of our biology, there are restrictions on what responses are possible as the result of self-administering exogenous compounds (Curth, 2006). Historically scientists have generally categorized drugs of abuse into one of the following broad classes: Depressants include Alcohol, Barbiturates (amytal, seconal), Flunitrazepam or Rohypnol, GHB or Gamma aminobutyric acid, Methaqualone (Quaalude, spoor), Tranquilizers (atvan, valium, xanax). Stimulants include Cocaine, *khat*, nicotine (Cigarettes, Cigars, Spit tobacco, Kuber), amphetamine, methamphetamine, MDMA (Ecstasy), methylphenidate (Ritalin, Vitamin R) and caffeine. Hallucinogenic drugs include LSD, mescaline, THC, Psilocybin, Cannabis, Hashish and Marijuana. Narcotics (opiates) include Heroine, Morphine, Opium (Laudanum, Paregoric) and Oxycodone (oxycontin). Inhalants include solvents, gases, petroleum products (paint thinner, gasoline, glues, propane, and aerosol propellant), nitrites, Dissociative Anaesthetics and PCP-Phencyclidine (Angel dust). In many ways though, these categories are insufficient to adequately characterize the experiences produced by many of the drugs that are used illicitly (Evans-Brown, *et al*., 2011).

2.2 Regulation of psychotropic and precursor chemicals in Kenya

Administration of narcotic drugs, psychotropic substances and precursor chemicals are handled by the Pharmacy and Poisons Board (PPB). Moreover there has been close cooperation with the Kenya Police Anti-Narcotics Unit in co-ordination of seizures and putting up measures to ensure drugs and chemicals are not diverted for illicit use.

Precursor chemicals are used as raw materials in the manufacture of various pharmaceutical products, and have the potential of being converted to illicit drugs. Kenya has, however, recognised the possibility of precursors being diverted to illicit use while in the country or while in transit, and has put in place more stringent control on chemicals that were not controlled previously. The following is a list of more emerging drugs besides precursor chemicals

2.2.1 Doping in sports

In recent years, doping in sports with anabolic steroids has become a major international problem. Anabolic steroids were first developed in Nazi Germany in the 1930s, allegedly to help create an army of supermen (Marshall, 1988). The first known use of anabolic steroids in athletics is reported to have been by Russian weight lifters and some female athletes in the early 1950s. The anabolic steroids include danazol, methyltestosterone, ethylestrenol, methandrostenolone, nandrolone, oxandrolone, oxymetholone, stanozolol and tetrahydrogestrinone (brand names include Anadrol, Anavar, Danocrine, Dianabol, Metandren, and Winstrol). Physical side effects are associated with anabolic steroid use. Perhaps the most commonly reported are acne, balding, and reduced sexual desire. Men often experience atrophy of the testes and a related decline in sperm count and enlargement of the breasts. In women effects include growth of facial and chest hair, baldness, deepening of the voice, breast shrinkage, clitoral enlargement and menstrual irregularities. Another cause for concern is that steroid use often changes cholesterol levels that may increase the risk of heart disease. Damage to liver function is also common and can include an increased risk of liver cancer (Langenbucher *et al*., 2008).

2.2.2 Mephedrone

Mephedrone, also known as *Meph, meow, miaow-miaow, m-cat, plant food, drone, bubbles* and *kitty cat* is a synthetic stimulant drug of the amphetamine and cathinone classes. Mephedrone in fact, is chemically similar to the cathinone compounds found in the *khat* plant used in Africa for its stimulant effects. The *khat* leaves can be chewed or dried and consumed as tea. In 1980 the World Health Organization classified *khat* as a drug of abuse that can produce mild to moderate psychological dependence, high, ecstatic, and hallucinogenic effect. It was actually first synthesized in 1929 but did not become widely known until it was rediscovered in 2003. Up until around 2007, mephedrone was freely available for online purchase; since then, however, more and more European countries began to impose legal enforcement that make

mephedrone an illegal drug due to growing evidence of harm. Mephedrone became Class B substances under the Misuse of Drugs Act 1971 on 2010.

The drug is sold as crystals, capsules and white powders and is sometimes mixed with other cathinones and caffeine. The powder is usually sniffed/snorted or swallowed. Swallowing is the most common way of taking the drug where it is mixed with liquid to drink, or wrapped in a cigarette paper and sniffed/snorted (known as "bombing"). There have also been some reports of people injecting the drug. The drug may produce euphoria, alertness, talkativeness and feelings of empathy. The risks include severe nose bleeding after snorting as well as anxiety, paranoia, agitation and hallucinations. The risks also cause over-stimulating of the heart and the nervous system, and increase the chances of having a fit (get very angry and fly into a rage). Other effects include palpitations, insomnia, short-term memory loss, vertigo (a sensation of whirling and loss of balance), grinding of teeth, sweating and uncomfortable changes in body temperature. The risks are higher when it is combined with alcohol or prescribed with over-the-counter medications, snorted (due to the risk of damage to the lining of the nose) or injected (due to the risks of vein damage and of contracting blood borne viruses). Mephedrone has been identified as a possible contributor to deaths in the UK.

2.2.3 Piperazines

Piperazine is also commonly known as *A2, Blast, Bolts Extra Strength, BZP, Cosmic Kelly, ESP, Euphoria, Exodus, Fast Lane, Frenzy, Happy Pills, Legal E, Legal X, Nemesis, Party Pills, Pep, Pep Love, Pep Stoned, Pep Twisted, Rapture, Silver Bullet, Smiley's, The Good Stuff*. Piperazines are a broad class of chemical compounds used widely in human and veterinary medicines. Some piperazine compounds act as effective worming agents for pets and farm animals and were first used as an anthelmintic in the 1950s. Generally, they work by paralysing the parasites, which allows the host body to easily remove or expel the invading organism. They are also used in industry to make plastics, resins, pesticides, brake fluid and a variety of materials and products.

Benzylpiperazine (BZP) belongs to Class C (controlled drugs) and is now being abused as a designer drug/recreational drug because of its euphoric, stimulant effects much as the amphetamine/MDMA group. The drug which mimics the effects of ecstasy is sold in tablet, powder, capsules or liquid form. Effects are known to last for 6 to 8 hours. With decreased

appetite and sleeplessness, users often suffer a severe hangover-like reaction that can last for up to 24 hours.

The risks of taking BZP include, agitation, vomiting, stomach pain, fits, irregular heart rhythms, diarrhoea, allergic reactions and fever. Mixing BZP with amphetamines (like ecstasy and speed) and alcohol can be very dangerous. In rare cases users may suffer from serotonin syndrome, which can cause high blood pressure and may be fatal.

2.2.4 Spice/K-2

Spice or K-2 is synthetic cannabis or cannabinoid drug sold "legally" on the premise that it is a mixture of traditional aromatic herbal incense. It is also referred to *fake weed, Yucatan Fire, Skunk, Moon Rocks*. It is quickly gaining acceptance among adolescents and college students (Hu *et al.,* 2011). Easy access and the misperception that Spice products are "natural" and therefore harmless have likely contributed to their popularity and they are second to marijuana. Some Spice products are sold as "incense". Like marijuana, Spice is abused mainly by smoking or sometimes mixed with marijuana or prepared as a herbal infusion for drinking.

When smoked, it produces a euphoric effect like marijuana, which includes elevated mood, relaxation, and altered perception. Some users have psychotic effects like extreme anxiety, paranoia and hallucinations. Spice abusers experience rapid heart rate, vomiting, agitation, confusion and hallucinations. Spice is also known to raise blood pressure and causes reduced blood supply to the heart (myocardial ischemia), and in a few cases it has been associated with heart attacks. Regular users may experience withdrawal and addiction symptoms. However, Spice does not show up as positive results in drug testing for cannabis. This drug has caused many harms and deaths among teenagers especially in the Americas.

2.2.5 Peyote

Peyote is a cactus plant which grows in rocky soil in the wild. Historical records document use of the plant by Indians in northern Mexico from as far back as pre-Christian times, when it was used by the Chichimeca tribe in religious rites. The plant grows as small cylindrical-like "buttons". The buttons were used to relieve fatigue and hunger, and to treat victims of disease. The peyote buttons were used in group settings to achieve a trance state in tribal dances, (Report Series, 1973). It was used by the Native Americans in ritualistic ceremonies. In the U.S., peyote was cited in 1891 by James Mooney of the Bureau of American Ethology

(Mooney, 1896). Mooney talked about the use of peyote by the Kiowa Indians, the Comanche Indians, and the Mescalero Apache Indians, all in the southern part of the country.

In 1918, he came to the aid of the Indians by incorporating the "Native American Church" in Oklahoma to ensure their rights in the use of peyote in religious ceremonies. Peyote drug street names are *buttons, cuctus, Mesc, peyote* or *sacred medicine*. The active ingredient in peyote is the hallucinogen mescaline. The drug produces psychoactive, hallucinogenic effects (Steven, 1998). The principal alkaloid of peyote responsible for its hallucinogenic response is mescaline, a derivative of ß-phenethylamine. The extent of abuse of illicit mescaline has not been accurately determined. The drug is generally taken orally but may be injected. Because of its bitter taste, it is often taken with tea, coffee, milk, orange juice, soda, or soft drink.

2.2.6 Ketamine

Ketamine (*special K, K, vitamin K, cat Valium*) is a favourite drug used medically in hospitals, including emergency departments. Ketamine is produced in liquid form or as a white powder. It has been used for short procedural sedation purposes particularly for children. Ketamine can potentially be abused and more often it is snorted or smoked with marijuana or tobacco products. Taken in larger doses, ketamine can cause delirium, amnesia, impaired motor function, high blood pressure, depression, and potentially fatal respiratory problems. Low dose intoxication from ketamine results in impaired attention, learning ability and memory (NIDA, 2004). According to UNODC, Ketamine remains the primary drug of use among young drug users in Hong Kong, China.

2.2.7 Ya ba

Yaba is known as *'crazy medicine'* pronounced *'yar bah'* in Malaysia and Indonesia, the related compound is known as *shabu* or *syabu*. It is a derivative of synthetic Amphetamines such as *Speed* and is manufactured far more quickly and easily than traditional forms of amphetamines. This drug creates an intense hallucinogenic effect and can enable users to stay awake for days on end. It was originally created by German chemists under the instructions of Adolf Hitler to find a stimulant that would help his soldiers to fight around the clock. It is a new or re-emerging recreational drug in the West, and more popular than Heroin in parts of the Far East, and is heading for Britain, amid warnings that it could supersede Ecstasy as the drug of choice for the country's clubbers. It has become increasingly popular in the Far East amongst claims that the drug is now bigger than Heroin in Thailand.

Yaba is cheaper and easier to produce than Ecstasy (MDMA) and the main ingredients include salt, household cleaning products, distilled cold medicines and lithium from camera batteries.
It is a 30% methamphetamine with 70% caffeine. This makes it easier for it to be produce at home and in countries where it has been criminalised; the factories are mobile and keep shifting from place to place.

The effects include increased heartbeat, dehydration, paranoid feeling, sweating, insomnia, irritability, hallucinations and depression. Regular use of the drug has been linked to lung and kidney disorders, hallucinations and paranoia. A frequent disturbing hallucination is 'speed bugs' or 'crank bugs' where users believe that bugs are crawling under their skin and go loopy trying to get them out. In Thailand, the number of students entering rehabilitation to deal with *yaba* addiction has risen by nearly 1,000% in the recent past. The abusers are susceptible to severe depression and suicidal urges.

2.2.8 Happy water

This is a newer form of a combination of ecstasy, ketamine, and other types of drugs, manufactured in China. It is an opiate classified with other stimulants of amphetamine extract, (China National Narcotic Control Commission, 2009). Samples tested positive for methamphetamine, caffeine, ketamine and other illegal components (Chinese journal of drug abuse, prevention and treatment, 2011)

2.2.9 Shisha

Shisha commonly known as *hookah, goza, narghile, hubbly-bubbly* and herbal tobacco, is a water-pipe, popular in many Arab countries. It is sold as fruit-scented or floral-scented tobacco. The scented flavour varies from fruit scent (apples, grapes and strawberries) to floral scent (coconut, vanilla and rose). It is burnt using coal, passed through an ornate water vessel and inhaled through a hose. The tobacco is no less toxic in a hookah pipe, and the water in the hookah does not filter out the toxic ingredients in the tobacco smoke since nicotine is not water-soluble. Thus, *Shisha* smoke retains all the carcinogens of cigarette smoke while adding more carbon monoxide and a separate set of carcinogens from the use of burning coals to keep the nicotine flowing. Thus, people who smoke *Shisha* are likely to suffer from high carbon monoxide levels.

Cooling the *Shisha* smoke using water, makes it feel less 'harsh' and as a result people inhale more deeply into their lungs, taking large volume of smoke in one smoking session. This increases the risks even further.

Studies conducted have shown strong indicators that smoking *Shisha* is very dangerous and is certainly not a safe alternative to cigarette smoking. World Health Organization (WHO) reported that *Shisha* smokers inhale more than 100 times the level of tobacco smoke in a shisha session compared with one cigarette. The report suggested that the health effects of smoking *Shisha* are extremely serious since smoking delivers nicotine to the smoker and has the same passive smoking effects as smoking cigarettes. Other studies suggest that fumes from coals used to evaporate the tobacco increases the smoker's exposure to harmful substances. The WHO, U.S. News and World report, indicated that *Shisha* also carries a risk of addiction, can promote and lead to cigarette smoking. It is also a danger to health because of daily water pipe usage and sharing. The sharing is coupled with the risk of tuberculosis (TB) or hepatitis infection from shared mouth pieces. Studies carried out in the Middle East suggested that *Shisha* smokers are at higher risk of developing gum disease than cigarette smokers and five times more likely to develop gum disease than non-smokers.

2.2.10 *Kuber*

Kuber is a Tobacco product native of India and now has made its appearance all over Africa. *Kuber* Tobacco contains 25% nicotine and 28 cancer causing agents. Its users take three to four times more nicotine than cigarettes. It contains cannabinols and delta 9-tetrahy cannabinol (THC). THC is the primary ingredients in India's hemp (Marijuana) hence qualifying as an illegal drug. It is banned in Malawi, Tanzania and Botswana. (The voice magazine, 2011). *Kuber* has negative cardiovascular effect on the users in the long term (Botswana Guardian newspaper, 2011). South Africa's Durban Central Crime Prevention Unit termed *Kuber* as 'a very addictive intoxicating drug that affects the Central Nervous System, increases behavioural activity, thought processes and alertness' (Grocott's Mail, 2011). It induces stimulation and increases libido both in men and women. *Kuber* is packed and sold as mouth freshener in sachets similar to tea leaves and is easily available at Chinese and Indian herbalist shops.

CHAPTER THREE: METHODOLOGY

3.1 Study Sites

The studies were conducted in selected districts within Mombasa and Nairobi Counties. The Coast region has a population of 3,325,307 (KNBS, 2009). In the Coast region, Mombasa County was purposively selected based on the drug prevalence and geographic location of rehabilitation centres. Mombasa County is located on the South Eastern part of the Kenyan Coast. The County borders the Indian Ocean to the East and South East, Kilifi County to the North and Kwale County to the West and South West. The County has a population of 938,370 and covers an area of 218.9Km². The County is home to Kenya's largest sea-port, the Kalindini Harbour. It has an International airport and is a major tourist destination in the country. The County serves as the Centre for the Coastal tourism industry. The 4 districts of Mombasa County purposively selected were Mvita, Kisauni, Changamwe and Likoni.

Nairobi County was also purposively selected based on the prevalence of drug use. Nairobi region, which is also a County has a population of 3,138,369 (KNBS, 2009). The County is the Capital City of Kenya. It shares boundaries with Kiambu County to the North, Machackos County to the East, and Kajiado County to the South. The survey covered 3 Districts the area namely; Nairobi West, Nairobi East and Nairobi North.

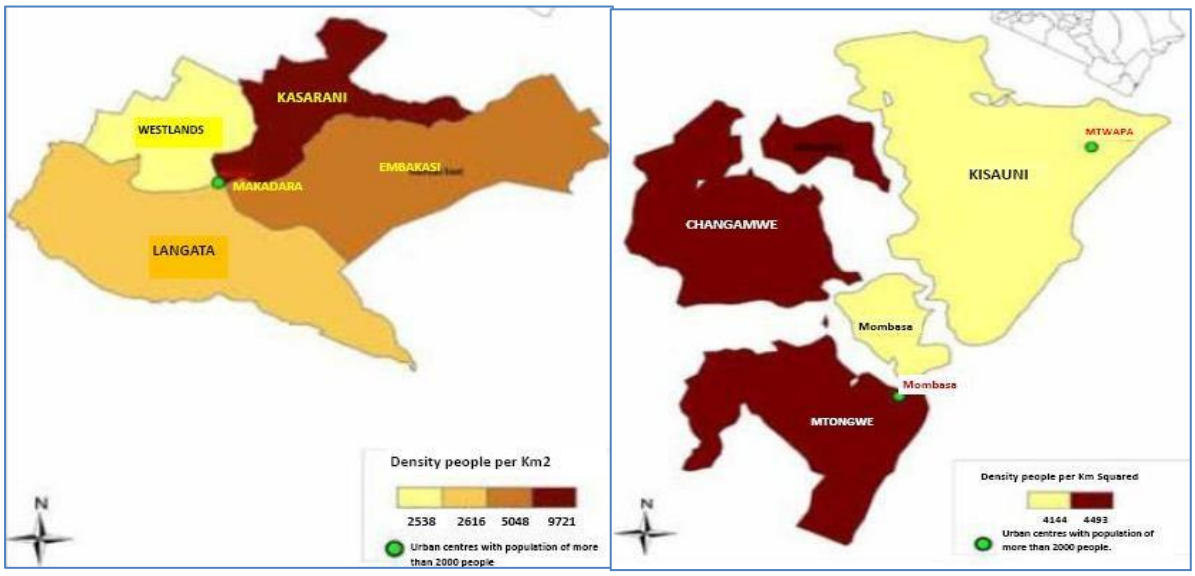

Figure 1: Maps of Nairobi and Mombasa Counties

3.2 Research design and sampling procedure

The study utilized an exploratory cross-sectional design where both quantitative and qualitative data was collected. The research was conducted to understand a social or human problem, based on building a complex, holistic picture, reporting detailed view of information, and conducted in a natural setting.

Purposeful and snowball, a non-random sampling method was used to identify a potential respondent. This method is feasible when studying a hidden population whom adequate lists and consequently sampling frame are not readily available. This method is also particularly effective in locating members of special populations where the focus of the study is on a sensitive issue like drug or substance use. Initial contacts were made through healthcare personnel in primary health care facilities, rehabilitation centres, welfare officers, faith-based organizations and NGOs. The respondents were asked to mention other persons according to the inclusion criteria defined for the study. The respondents for the study were chosen if: they were between 10-65 years, if they had ever used drugs or were using, were residents of Nairobi or Mombasa for not less than 6 months and consented to participate in the study with no monitory gain.

3.3 Data collection

The respondents who had signed the consent form or gave an oral consent to participate in the study were interviewed using a structured questionnaire on emerging drugs and drug use. The interview captures issues on socio-demographic and socio-economic factors, emerging drug use and poly drug use among emerging drug users. To protect the privacy and confidentiality of the study participants, a secluded room or place was identified in each of the study sites where the subjects reported for interviewing purposes. The questionnaire was translated into Kiswahili to minimize the translation bias. Key informant interview was subjected to health care providers in the rehabilitation centres. Focus group discussions (FGDs) were also carried out with questions targeting the different types of emerging drugs, socio-economic impacts among the users and strategies required to manage the problem of emerging drug use. These responses were used to supplement the findings of the study. The FGD comprised of 8-10 participants who were emerging drug users. FGDs were tape-recorded with participants' consent.

3.4 Data analysis

Data was coded, sorted, entered into the computer and processed using SPSS software version 17, Excel, Stata and SAS software 2000. Stata was used for both descriptive and comparative studies to evaluate the factors using the Poisson and logistic modelling. Econometric modelling was also used. Descriptive statistics namely frequencies, pie chart, bar graphs and percentages were used to describe, organize and summarize collected data. The Pearson Correlation Coefficient was used to establish the associations between categorical variables. Multivariate analysis was used to assess the independent predictors of emerging drug use. Responses from open-ended questions, key informant interviews and FGDS were analysed qualitatively through content analysis. The written material from the FGDs and open ended questions were broken down into broad thematic areas within which emerging themes and quotes werer generated through carefully designed criteria. This information was used to supplement, explain and interpret quantitative data.

CHAPTER FOUR: RESULTS

4.1: Social demographics

The research was conducted in Mombasa County where the respondents were 352 with females comprising of 33.8 % and the males 66.2 % and in Nairobi County where the respondents were 350 with females accounting for 22.9 % and males 77.1 % (Figure 2).

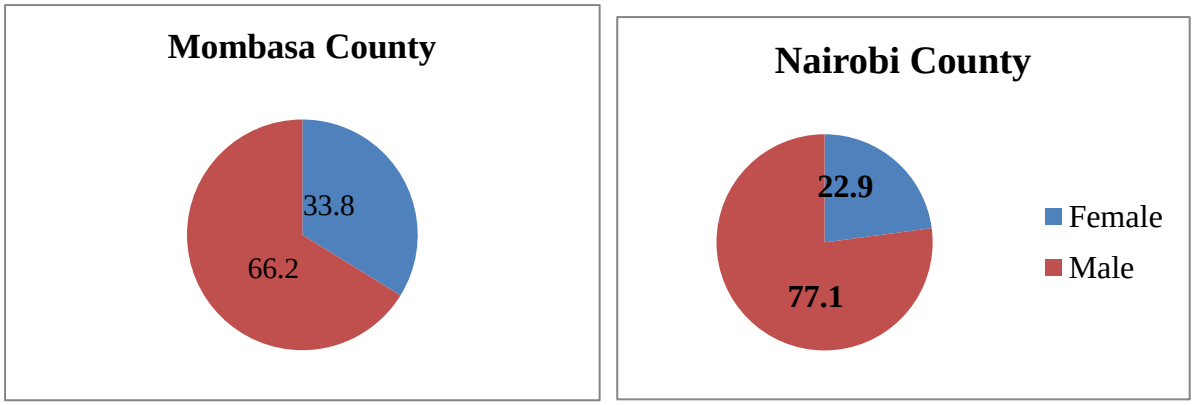

Figure 2: Gender parity on use of EDs in Mombasa and Nairobi Counties

4.1.1: Level of education of respondents

Most of the respondents were graduates of primary or secondary education. Nairobi had higher percentage with secondary education accounting for 46.9% followed by 41.7% with primary education. However, in Mombasa more respondents had primary education (58.7%) followed by secondary education (22.2%) and only 0.4% of the respondents from Nairobi had a degree (Figure 3).

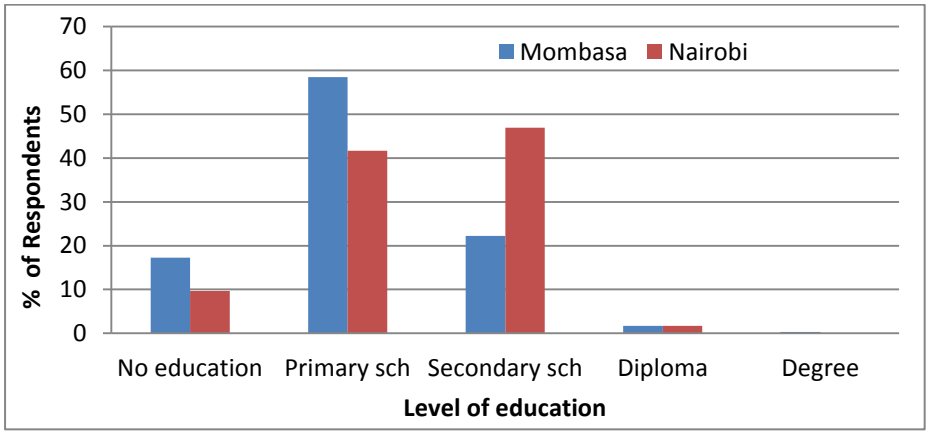

Figure 3: Respondents' education

4.1.2: Age distribution

The distribution of the abusers of the EDs followed a normal distribution curve with most of the abusers in both Mombasa and Nairobi Counties being youths. Most of the abusers were recorded in the age groups of 21-25 years, 26-30 years, 31-35 years and 36-40 years in that order. Significantly higher percentage of abusers was recorded in Mombasa between 26- 30 years (Figure 4). Mombasa had abusers being recorded in the early and old age groups of 10-15 years and 55-60 years, respectively though the percentages were relatively low accounting for less than 3 % of the respondents. Highest number of respondents was at 26-30 years (37.7% and 27%) followed by 31-35 years (26.3% and 21%) in Nairobi and Mombasa, respectively.

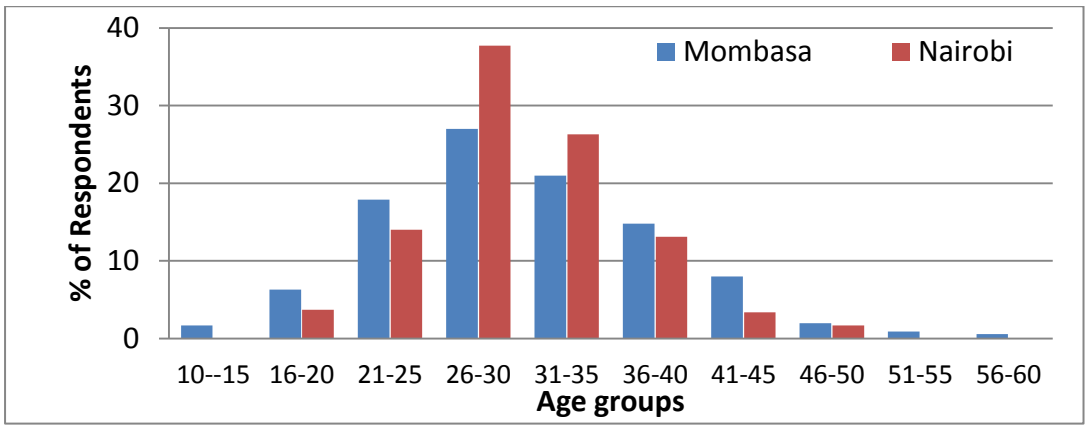

Figure 4: Age distribution of the respondents in Mombasa and Nairobi Counties

4.1.3: Effect of religion

It was observed that most of the abusers of EDs in Mombasa were Muslims followed by Christians accounting for 56.3% and 38.8%, respectively. However, in Nairobi Christians accounted for 73% while Muslims 18% of the total respondents (Figure 5). Buddhists in Mombasa comprised 2.6% of the total respondents.

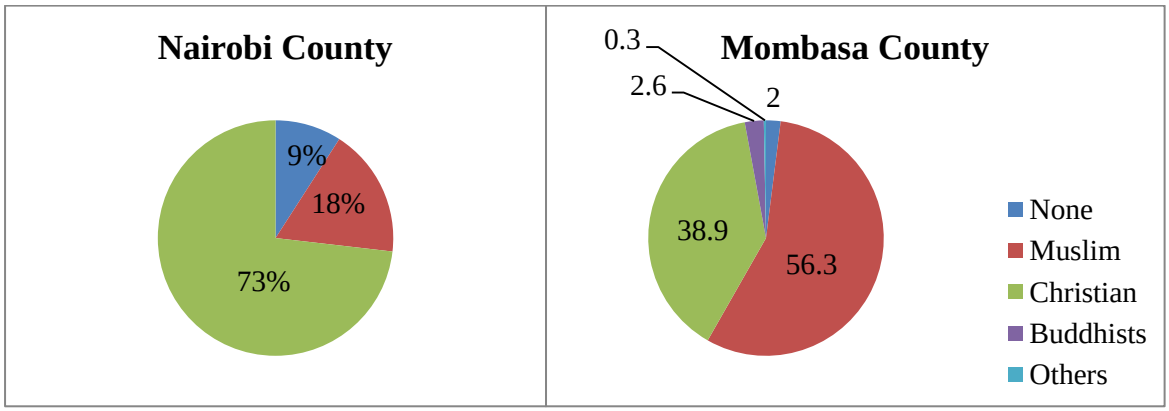

Figure 5: Proportion religion of respondents

4.1.4: Respondents' occupation

This survey also tried to identify the occupational status of the participants who abuse the emerging drugs. Various social grades and different careers were involved in the abuse of the emerging drugs. They ranged from *Jua kali* artisans, non-working, employed persons, sex workers, touts, students, self-employed and thieves (Figure 6). Significant differences were observed on the number of respondents taking the emerging drugs between the type of occupation and within the county. In Mombasa County, the non-working group were leading with 47.7 % compared to 34.9% in Nairobi. In Nairobi County, *Jua kali* artisans were leading with 46.9% of the total respondents compared to 21.9% in Mombasa. The percentage of employed respondents abusing the EDs was comparable in both counties accounting for 11.4% and 11.1% in Nairobi and Mombasa County respectively. Significantly higher percentage of sex workers in Mombasa abused drugs compared to Nairobi County which accounted for 6.3% and 2.9% respectively. The students accounted for 4.0% and 1.4% of the total respondents in Mombasa and Nairobi County. A unique case of 0.9% of the night runners was recorded in Mombasa County.

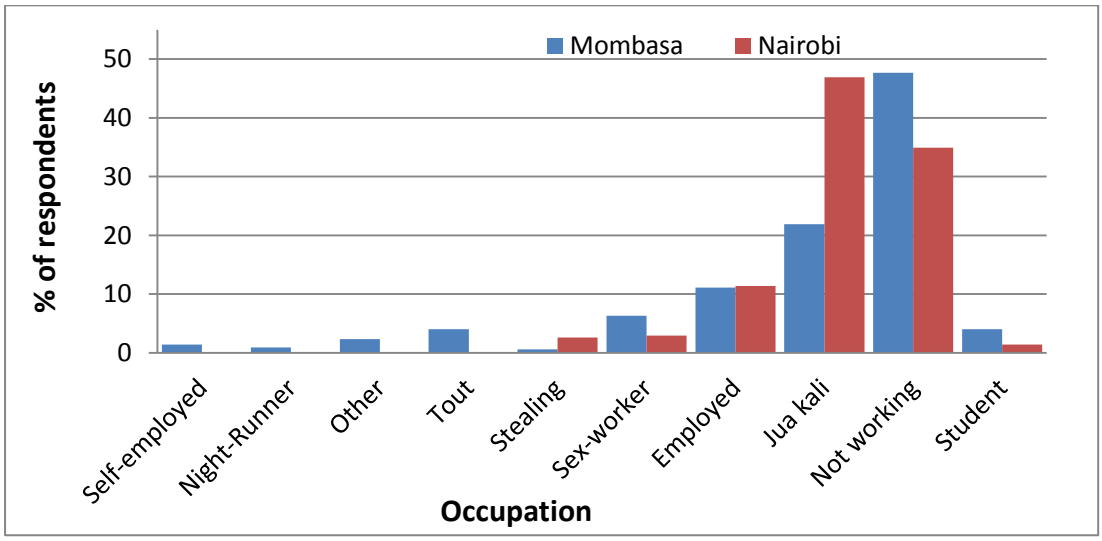

Figure 6: Respondents' occupation

4.1.5: Marital status

Most of the abusers in both counties were found to single people. Mombasa had significantly higher percentage of single persons abusing the EDs than Nairobi, which accounted for 64 % and 57% respectively. However the number of married persons abusing the EDs was comparable in both Mombasa and Nairobi County, accounting for 26.1% and 24.3% respectively. Significantly higher percentage of divorced/separated persons in Nairobi abused the ED relative to Mombasa accounting for 20% and 7.1% respectively (Figure 7).

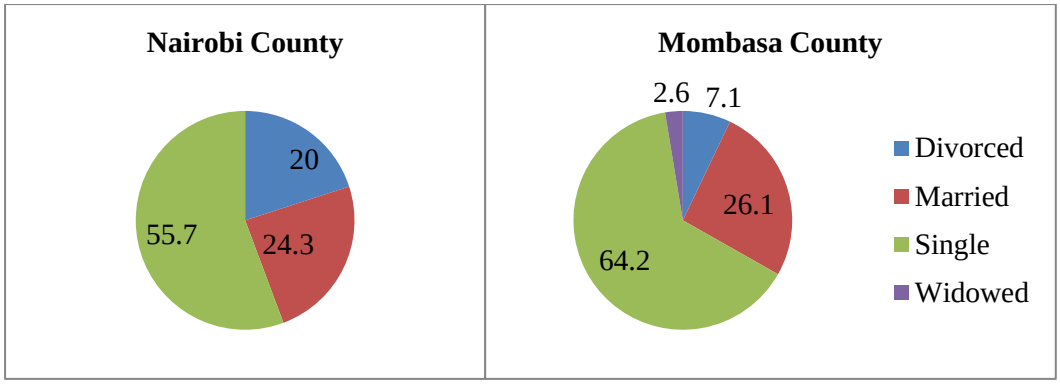

Figure 7: Respondents' marital status in Mombasa and Nairobi Counties

4.2: Types of drugs

About 40 different types of drugs were abused by the respondents. Number of emerging drugs was 32 and 21 in Nairobi and Mombasa respectively. Some drugs were abused in isolation while others were a mixture of two, three or four types of drugs. Most of the highly abused drugs were *kuber*, *shisha*, *shashaman*, *mau*, *tambuu*, jet fuel, *kukumanga*, *mkorogo*, *mshomoro* and *kamusi* and were common in both Nairobi and Mombasa County (Figure 8, 9, 10). Many were derivatives of bhang from different countries (*shashaman* from Ethiopia).

Among the most commonly abused emerging drugs, Mombasa County recorded higher percentages than Nairobi except shisha which was higher in Nairobi. Most of the respondents took the emerging drugs due to lack of awareness while some people do not even think that the combinations were kinds of emerging drugs. *Kuber* and *shisha* were the most preferred drugs in both counties though the percentages varied between counties. Significantly, a higher number of respondents in Mombasa County abused *kuber* than Nairobi County accounting for 21.2% and 15.4% respectively. However, the abuse of *shisha* was comparable in both counties with 14.3% and 14% recorded in Nairobi and Mombasa County respectively. Some of the drugs were unique within counties e.g. the drugs *shashaman*, *mau*, *mkorogo* were abused in Mombasa County only accounting for 15.6%, 14.4% and 8.1% respectively.

Comparative studies were done using Poisson model and in Mombasa County, Mvita and Starehe were used as the base of the analysis. Religion had a significant effect of drug abuse of one abusing drugs. It was significantly less likely (P = 0.03) for people in Nairobi to abuse drugs than Mombasa County. There was no difference on the use of drugs in the three Districts of Mombasa County. However the level of drug use in Nairobi was significantly higher in Westlands, Langata and Eastlands district than Starehe District (Table 1).

The high Pseudo R^2 indicated goodness of fit for regression estimators meaning that there were relationships on the drug usage. The values of R^2 and Adjusted R^2 shown above for the analyzed data were within the accepted range and therefore showed that the model fitted well with the predictor variables (Table 1).

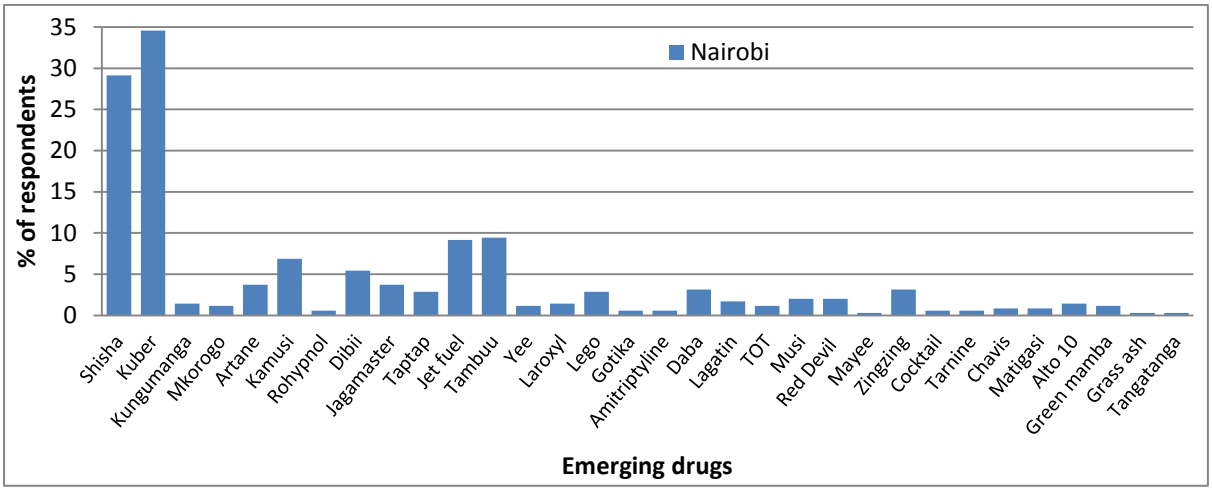

Figure 8 : Emerging drugs in Nairobi County

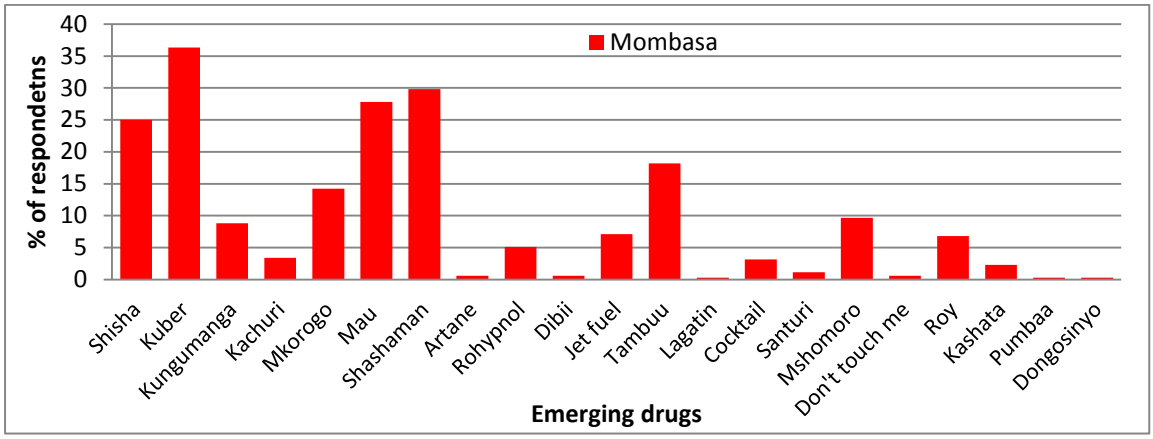

Figure 9: Emerging drugs in Mombasa County

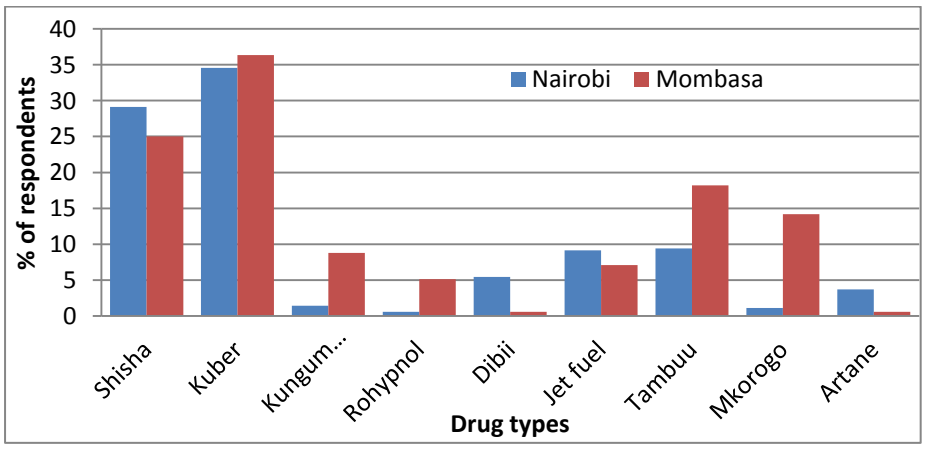

Figure 10a: Commonly abused emerging drugs

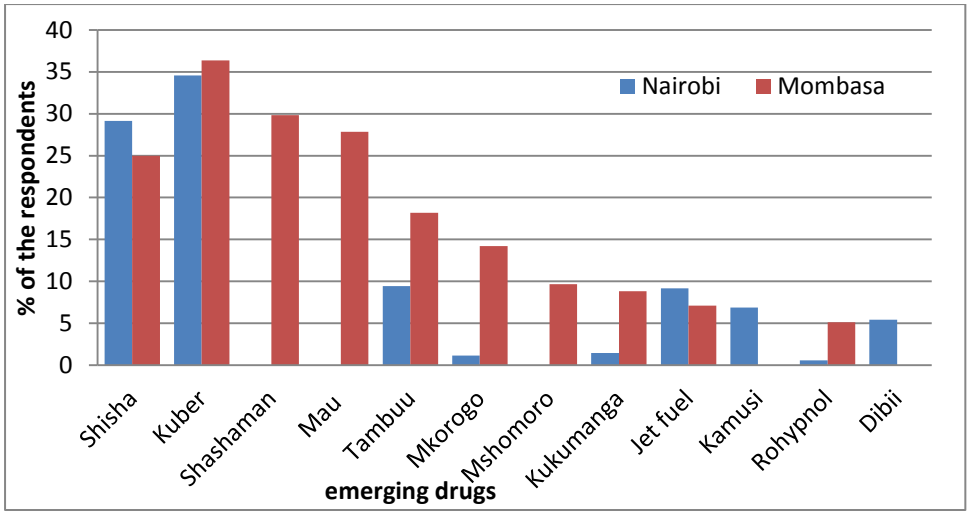

Figure 11b: Most abused emerging drugs in both counties

Table 1: Comparison of districts and social demographic factors and their influence on drug abuse

Drugs	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Gender	0.0238	0.03	0.71	0.48	-0.04	0.09
Religion	0.0982	0.02	5.41	**0.00**	0.06	0.13
Education	-0.0183	0.02	-0.82	0.41	-0.06	0.03
Marital	-0.0099	0.02	-0.47	0.64	-0.05	0.03
Occupation	0.0099	0.01	0.94	0.35	-0.01	0.03
Nairobi	-0.1515	0.07	-2.25	**0.03**	-0.28	-0.02
Likoni	-0.0004	0.06	-0.01	0.99	-0.11	0.11
Kisauni	0.0384	0.06	0.67	0.50	-0.07	0.15
Changamwe	-0.0141	0.06	-0.24	0.81	-0.13	0.10
Westlands	0.1786	0.07	2.72	**0.01**	0.05	0.31
Langata	0.1533	0.07	2.18	**0.03**	0.02	0.29
Eastlands	0.1682	0.07	2.50	**0.01**	0.04	0.30
Age	-0.0132	0.01	-1.11	0.27	-0.04	0.01
_cons	1.7755	0.10	18.41	0.00	1.59	1.96
***Mombasa**						
***Mvita**						
***Starehe**						

χ^2 (P) < 0.00001

4.2.1: Initiation age of abusers

The average (± SD) age of the sample of 350 and 352 respondents was 17.7 ± 3.4 years and 16.3 ± 4.0 years in Nairobi and Mombasa respectively. Drug initiation age in Mombasa ranged from 4 year to 30 years contrary to Nairobi County which ranged from 9 years to 30 years. Mombasa had higher number of respondents initiated below the age of 15 years. However, the situation changed between 16 and 20 years. Ages 15 and 20 years recorded the highest number of youth initiated to drugs in Mombasa County (14.5%) and Nairobi County (24%). Mombasa had higher number of respondents initiated to drugs. Females were initiated to drugs at the age of 9 years in both Counties. 26.5% of the female respondents were initiated to drugs in Nairobi County compared to 12% in Mombasa County (Figure 11, 12).

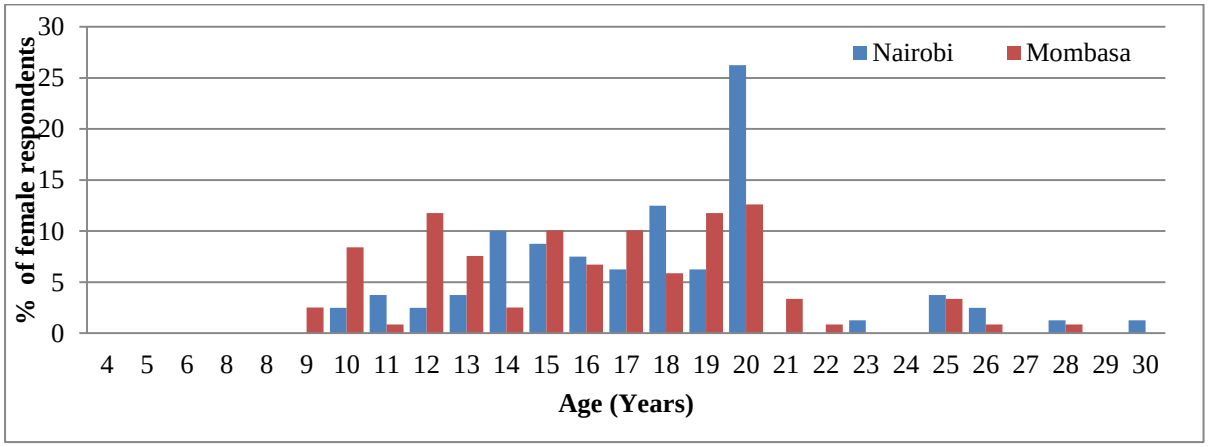

Figure 12: Comparison of initiation of females

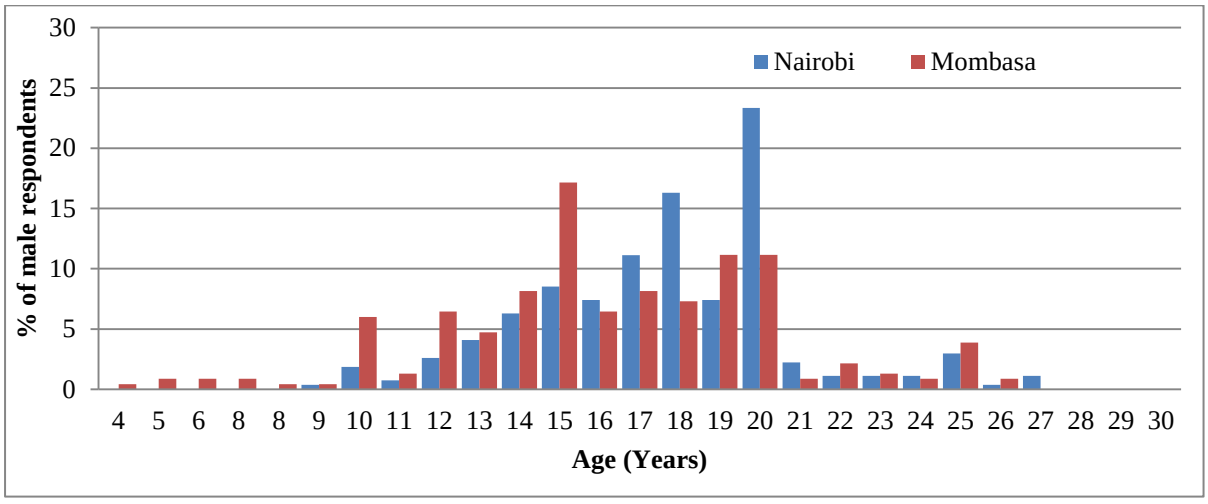

Figure 13: Comparison of Initiation of males

4.2.2: Mode of administration

Smoking, drinking, chewing and injecting were the most preferred modes of administration. Significant difference was observed in all the modes of administration between Mombasa and Nairobi County. A significantly higher number of respondents from Mombasa County administered the drugs through smoking (69.6%), injecting (33.5%) and snorting (4.3%) than Nairobi County. However, in Nairobi more respondents administered the drugs through chewing (54.3%), drinking (39.7%), smoking, 38.6% and inhalation (21.7%) (Table 2).

Table 2: Modes of administration of drugs

	Nairobi		**Mombasa**	
	Freq	Percent	Freq	Percent
Chewing	190	54.3	157	44.6
Drinking	139	39.7	28	8.0
Smoking	135	38.6	245	69.6
Inhaling	76	21.7	54	15.3
Injecting	9	2.6	118	33.5
Snorting	2	0.6	15	4.3

4.2.3: Contribution factors to drug abuse

The respondents gave a number of reasons as to why they started abusing the emerging drugs. Peer pressure, curiosity, stress and frustration were identified as the most important factors that made the respondents start abusing the drugs. Peer pressure was the highest accounting for 72.4% and 52.7% in Nairobi and Mombasa respectively. However other responses such as feeling good, acceptance, availability and cheapness varied between the counties as reasons (Figure 13).

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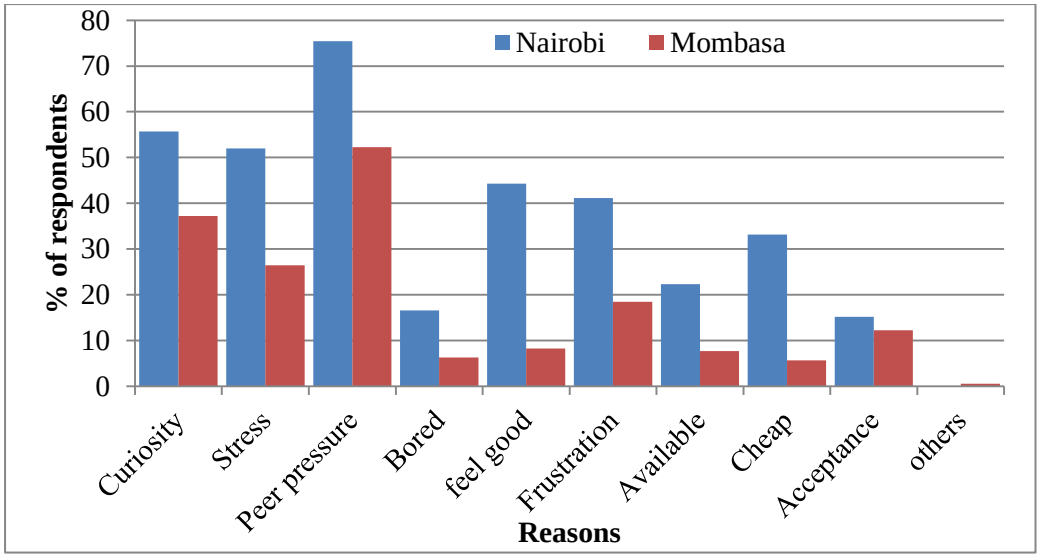


Figure 14: Reasons for drug abuse

4.2.4: Introduction and source of information on drugs

Friends had a lot on influence on the respondents taking the drugs accounting for 90.6% (SD± 0.29) and 76.7% (SD± 0.42) in both Nairobi and Mombasa respectively. Influence by friends in Nairobi was significantly higher than Mombasa. This was followed by self (26.5%) in Nairobi and 15.5% in Mombasa (Table 3). The large number of the respondents who learnt through self could have been due to media, family exposure and even the internet or other channels.

Most of the respondents learnt about drugs from friends who accounted for 93.9% ± 0.29 (Std. Dev.) in Nairobi and 84.8% ± 0.42 (Std. Dev.) in Mombasa County. Internet had no influence on abuse of emerging drugs and accounted for only 0.2% and 0.3% in Nairobi and Mombasa respectively (Figure 14).

Table 3: Response on introduction to drugs

	Nairobi County		**Mombasa County**	
	Percent	Std. Dev.	Percent	Std. Dev.
Friends	90.6	0.29	76.7	0.42
Self	26.6	0.44	7.9	0.27
Relatives	12.9	0.33	15.3	0.36
Workmates	3.1	0.17	8.5	0.28
Family	2.3	0.15	6.3	0.25
Others	0.29	0.05	2.0	0.14

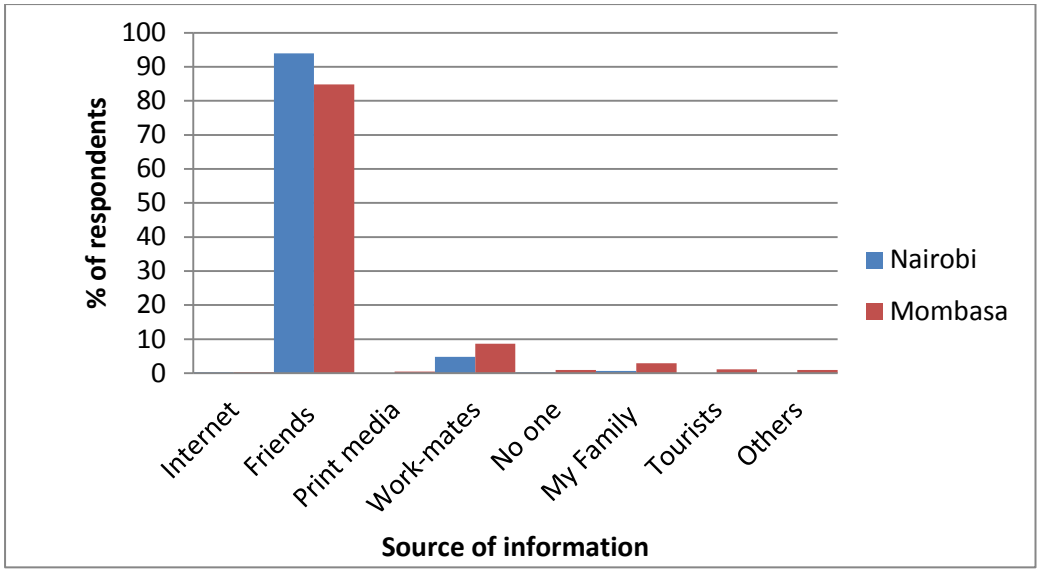


Figure 15: Source of information on drugs

4.2.5: Comparison of *Shisha* and *Kuber* with age in both Counties

The age of respondent's abusing *Shisha* and *Kuber* ranged between 16 and 45 years in Nairobi contrary to Mombasa where they ranged between 16 and 65 years. Respondents in the group of 26 to 30 years abused *Shisha* and *Kuber* most in both counties with *Kuber* accounting for 38.1% and 27.8%, and shisha 37.8% and 38.9% in Nairobi and Mombasa, respectively (Figures 15, 16, 17, 18). Unlike Mombasa, there was a high likelihood of *Kuber* abusers to also abuse *Shisha* in Nairobi.

It was observed that one was less likely to abuse *Shisha* in Nairobi (P=0.02) than Mombasa. Within Nairobi County one was more likely to abuse *Shisha* if they were in Westlands (P=0.02) and Eastlands (P=0.01) than Starehe Districts. However, in Mombasa one was less likely if they were in Likoni (P=0.04) and Kisauni (P=0.01) (Table 4).

Abuse of *Kuber* was positively associated with religion (P=0.017), education (P=0.04), occupation (P=0.049) of the respondents. One was less likely to abuse *Kuber* if in Nairobi (P=0.005) compared to Mombasa County. However in Westlands, one was more likely to abuse *Kuber* (P=0.05) (Table 5) while one was less likely to abuse *Kuber* in Kisauni (P<0.0001). The findings demonstrate that social demographic factors, such as religion, education, occupation, county and districts significantly affect the abuse of *Kuber* with age.

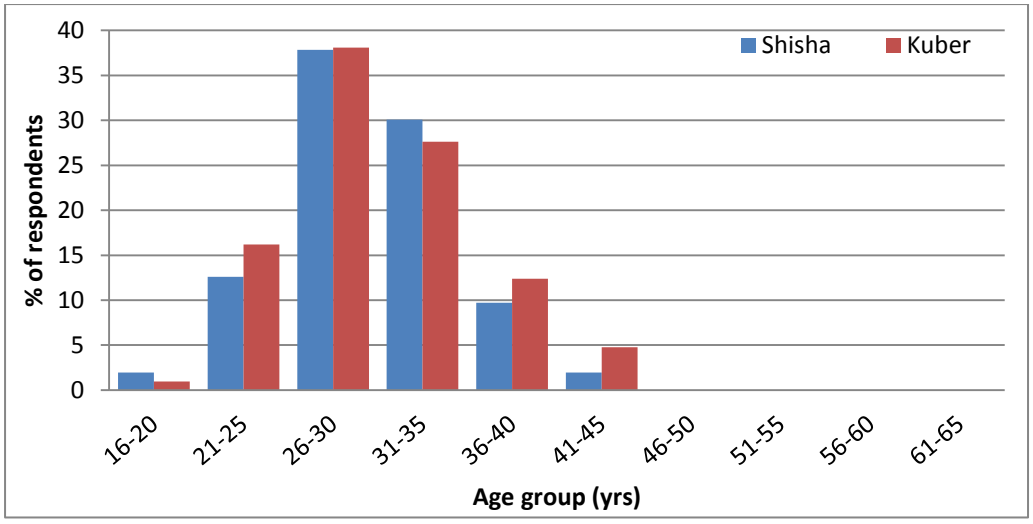


Figure 16: Comparison abusers of *shisha* and *kuber* with age in Nairobi County

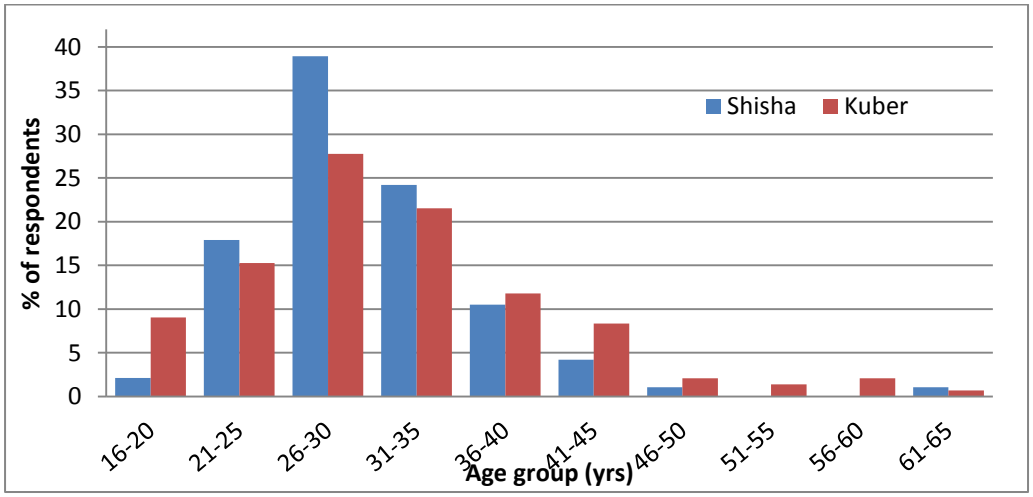


Figure 17: *Shisha* and *Kuber* abuse with age in Mombasa County

Figure 18: *Kuber* abusers between Nairobi and Mombasa Counties

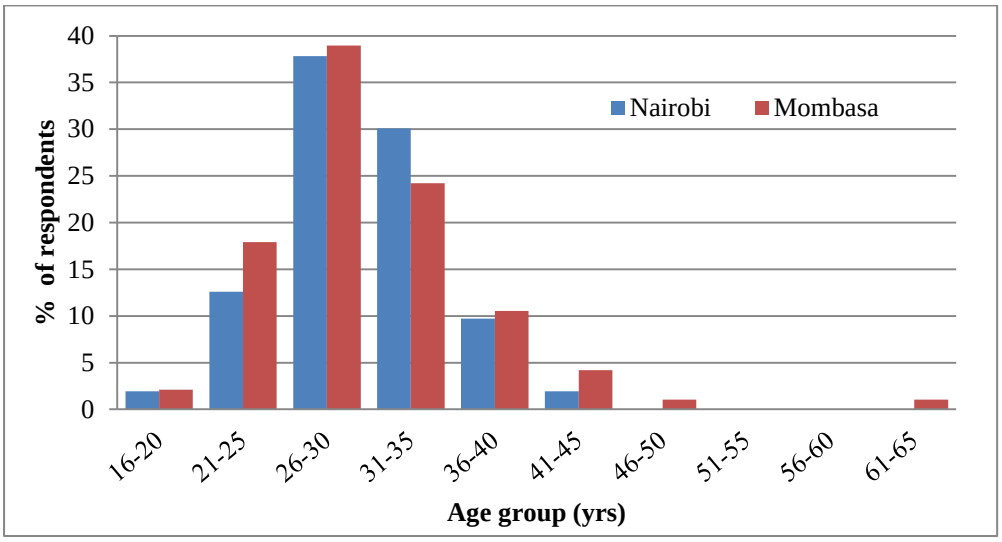


Figure 19: Shisha abusers between Nairobi and Mombasa Counties

Table 4: Influence of social demographics on abuse of shisha

Shisha	Coef.	Std. Err.	z	P>z	95% Conf.	Interval]
Gender	0.039	0.117	0.33	0.74	-0.19	0.27
Religion	-0.074	0.069	-1.07	0.29	-0.21	0.06
Education	-0.049	0.079	-0.62	0.54	-0.20	0.11
Marital	0.029	0.072	0.40	0.69	-0.11	0.17
Occupation	-0.039	0.038	-1.03	0.30	-0.11	0.03
Nairobi	-0.516	0.228	-2.26	**0.02**	-0.96	-0.07
Likoni	-0.427	0.204	-2.09	**0.04**	-0.83	-0.03
Kisauni	-0.570	0.207	-2.75	**0.01**	-0.98	-0.16
Changamwe	-0.166	0.199	-0.83	0.41	-0.56	0.22
Westlands	0.518	0.222	2.33	**0.02**	0.08	0.95
Langata	0.000	0.245	0.00	1.00	-0.48	0.48
Eastlands	0.578	0.226	2.56	**0.01**	0.14	1.02
Age	-0.001	0.042	-0.03	0.98	-0.08	0.08
_cons	-0.133	0.336	-0.39	0.69	-0.79	0.53
***Mombasa** ***Mvita** ***Starehe**						

Table 5: Influence of social demographics and age on abuse of *kuber*

KUBER	Coef.	Std. Err.	z	P>z	95% conf.	Interval]
Gender	0.049	0.19	0.26	0.793	-0.32	0.41
Religion	-0.271	0.11	-2.39	**0.017**	-0.49	-0.05
Education	-0.365	0.13	-2.89	**0.004**	-0.61	-0.12
Marital	0.077	0.11	0.69	0.493	-0.14	0.30
Occupation	-0.120	0.06	-1.97	**0.049**	-0.24	0.00
Nairobi	-1.006	0.36	-2.80	**0.005**	-1.71	-0.30
Likoni	-0.518	0.31	-1.67	0.095	-1.13	0.09
Kisauni	-1.271	0.34	-3.78	**0.000**	-1.93	-0.61
Changamwe	-0.392	0.31	-1.24	0.213	-1.01	0.23
Westlands	0.991	0.35	2.82	**0.005**	0.30	1.68
Langata	0.347	0.38	0.92	0.357	-0.39	1.08
Eastlands	0.116	0.37	0.31	0.755	-0.61	0.85
Age31	0.525	0.92	0.57	0.570	-1.29	2.34
Ageless30	0.368	0.90	0.41	0.684	-1.41	2.14
_cons	0.941	0.99	0.95	0.342	-1.00	2.88
***Mombasa** ***Mvita** ***Starehe**						

4.3: Sources of drugs

A number of outlets selling the emerging drugs are on the increase. Most of the drugs were purchased or outsourced from the streets. Significantly, a higher number of participants in Nairobi (92%) obtained their drugs from the streets than in Mombasa (61.9%). However, 42% obtained drugs from the smart shops in Mombasa compared to 8.9% in Nairobi County (Figure 19). The selling of emerging drugs on the streets and smart shops posed a common threat of reaching the unintended age groups especially the young children. Nevertheless, some outlets such as streets, smart shops, chemists and general shops were evidenced in enhancing the availability and accessibility of emerging drugs by providing their services in nearby vicinities and by operating at all times.

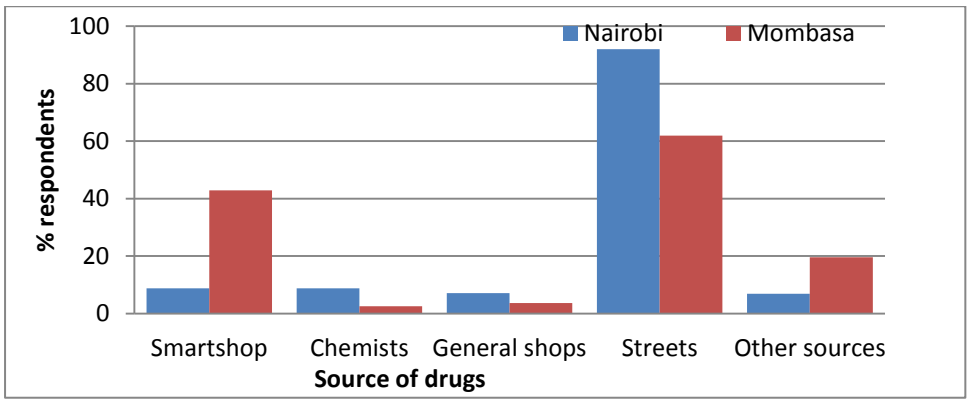


Figure 20: Source of drugs in Nairobi and Mombasa Counties

4.3.1: Place of drug consumption

The hot spots for emerging drugs ranged from public entertainment places to more private and more secret sites such as dens, nightclubs, hotels and rental houses. Most of the drugs that were consumed in the drug dens accounted for 87.1% and 82.1 % in Nairobi and Mombasa respectively followed by clubs, parties and homes. Consumption of the drugs was low in schools (Table 6). Entertainment places had become drug-infested places and this could be motivated by the high profit from drugs; owners of these establishments sometimes connive drug-abusing. It was noted that most of the respondents preferred abusing the drugs in the company of friends, in groups or alone.

Table 6a: Venue of drug abuse

	Nairobi County		Mombasa County	
	Mean	Std. Dev.	Mean	Std. Dev.
Club	58.9	0.49	39.2	0.49
Dens	87.1	0.34	82.4	0.39
School	1.7	0.13	3.7	0.19
Job	12.6	0.33	10.5	0.31
Party	36.0	0.48	17.6	0.38
Home	0.0	0.00	11.1	0.31
Other	2.0	0.14	4.5	0.21

4.3.2: Perception on EDs likeability, accessibility and affordability

The quick high effect, lasting high, affordability and accessibility were the major reasons why the respondents abused the emerging drugs. Most of the respondents preferred abusing the emerging drugs due to their 'quick high' producing marked psychoactive effects accounting for 56.3% and 55.7% in Nairobi and Mombasa Counties respectively. This was followed by lasting high effect in Mombasa (42.9%) and affordability in Nairobi (29.6%). Easy access of the drugs from the streets, drug stores and chemists made the respondents abuse them. Others abused the drugs because it was fashionable and easy to administer.

Some respondents were attracted to the emerging drugs by their alleged legal status. Increased availability was positively associated with increased use (Table 7). The study revealed that the drugs were readily available and accessible in many outlets. Relatively, Mombasa had higher accessibility and availability of emerging drugs than Nairobi. Most of the respondents felt that the emerging drugs were readily accessible accounting for 98% and 87% in Nairobi and Mombasa respectively (Table 5). Respondents in both counties were of the opinion that the drugs were affordable. In Nairobi, 39.7% said that the prices of the drugs were quite affordable while 50.6% said they were affordable. In Mombasa, 21% said it was quite affordable and 65.9% affordable (Figure 20).

There was a positive relationship between accessibility and affordability of drugs in both counties. Significant positive correlation of ($r=0.67$, $P<0.0001$) was observed between accessibility and affordability of drugs in Mombasa county.

Table 6b: Likeability of the drugs

	Nairobi		Mombasa	
	Percent	Std. Dev.	Percent	Std. Dev.
Quick high	56.3	0.50	55.7	0.50
Lasting high	23.4	0.42	42.9	0.50
Affordability	26.9	0.44	8.0	0.27
Accessible	10.3	0.30	8.2	0.28
Legal	0.6	0.08	2.6	0.16
Administer	1.4	0.12	2.6	0.16
Fashionable	2.6	0.16	3.1	0.17
Induce sleep	0.9	0.09	0.6	0.08
Sex inducing	-	-	3.7	0.19
Extra strength	-	-	3.1	0.17
Stay awake	-	-	0.6	0.08

Table 7: Accessibility of emerging drugs

	Nairobi	Mombasa
NA	0.9	0.6
Easily accessible	98.0	87.2
Hardly accessible	1.1	12.2

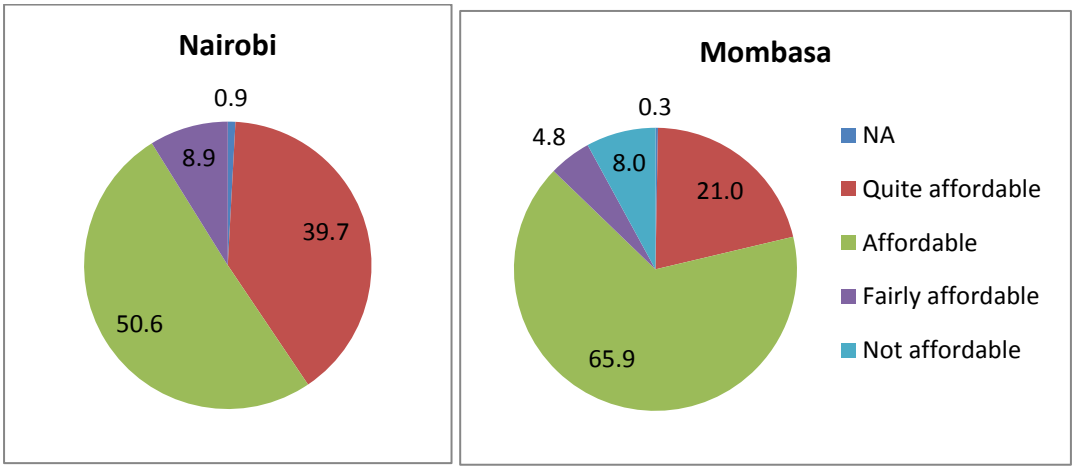


Figure 21: Perception on affordability of emerging drugs

4.3.3: Money spent on drugs

According to the interviewed consumers, larger proportion of the respondents spent an average of Ksh 200-500 per day with Mombasa having 38.9% while Nairobi 59.7% of the respondents. It was observed that 25.9% and 1.1% of the respondents spent over Ksh 1,000 per day in Mombasa and Nairobi respectively (Figure 21). Most of the money in both counties was from their own sources, accounting for 97.1% in Nairobi and 65.9% in Mombasa County, followed by money from friends and parents. In Mombasa a few cases got their drug money from stealing and the females from commercial sex (Figure 22). Use of Ksh 500 -1,000 per day translated to about Ksh 15,000 - 30,000 per month, which is quite an amount to spend on drugs considering most of the respondents were not employed. That could be the reason why some had to steal while others earned their money for drugs through prostitution. This was positively related to the types of drugs consumed in the county.

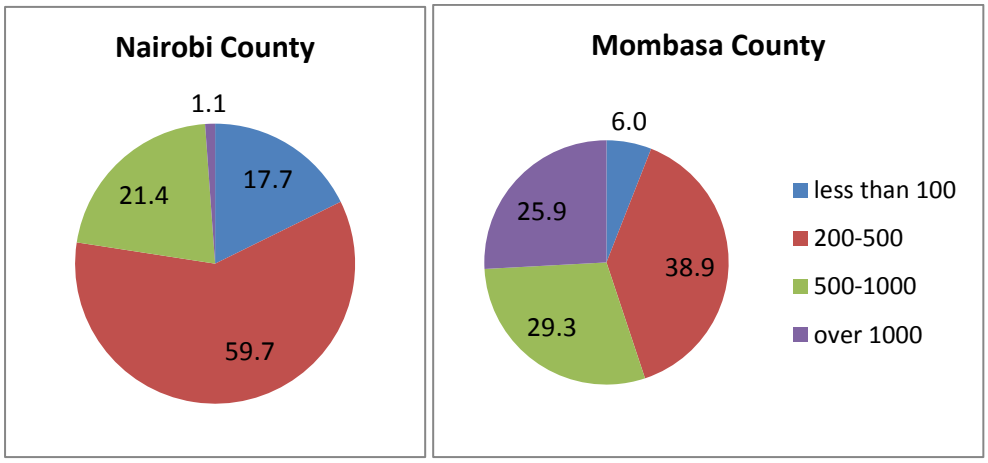


Figure 22: Money spent per day on emerging drugs (Ksh)

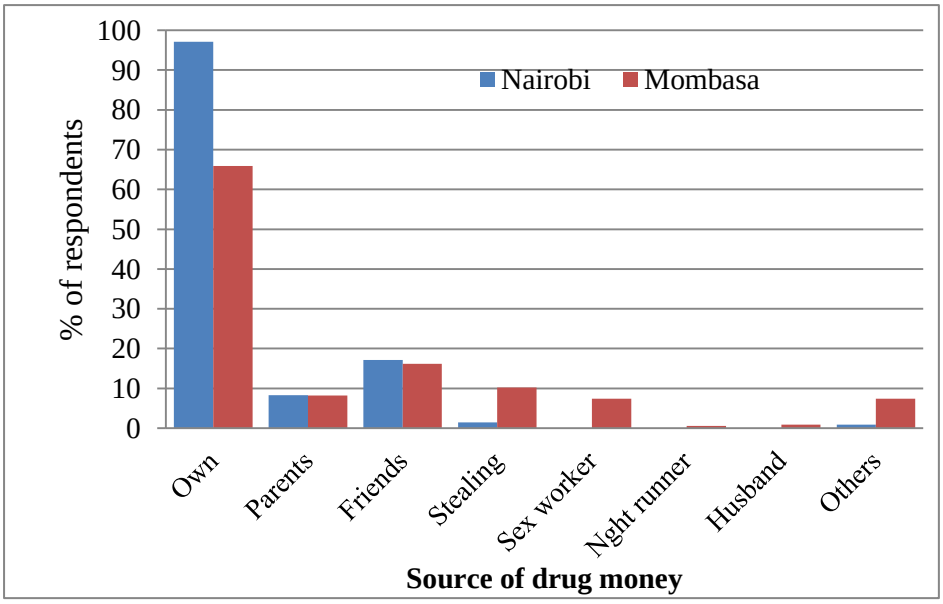


Figure 23: Source of drug money

4.4: Combination and substitution of drugs

It was observed that the emerging drugs were mostly taken in combination with the usual drugs. In Nairobi, the most common combination drugs were bhang (23.1%), *chang'aa* (21.7%), tobacco (17.4%) and *miraa* (14%). In Mombasa, the most common combination drugs were bhang (33.2%), heroin (24.1%), *chang'aa* (19.9%) and Tobacco (15.1%) (Table 8).

Other than combining the drugs, it was also noted that in some cases the participants substituted the mainstream drugs with the emerging drugs. The emerging drugs were sourced to substitute mainly bhang, heroin, tobacco and *chang'aa.* It was observed that Mombasa had higher preference on substitutions of mainstream drugs with emerging drugs than Nairobi. The ranking of the substitutions done were (28.4%) bhang and (27.8%) heroin and (19.6%) tobacco in Mombasa, and (25.7%) tobacco, (18.3%) *chang'aa* and (15.7 %) heroin in Nairobi. Significantly low numbers of the respondents substituted *miraa* and alcohol with the emerging drugs in both Mombasa and Nairobi though they are readily available and legal (Table 9).

As observed earlier on the combinations of emerging drugs with the commonly abused drugs, relatively low numbers substituted cocaine with emerging drugs. This may be associated to the greater dependency on cocaine as well as easier accessibility of cocaine. Respondents from Nairobi County abused prescription medicine more than Mombasa. The prescription drugs commonly abused included pain relievers, tranquilizers, sedatives and stimulants. Morphine, heroin and codeine belong to the group of opiates. Some of the prescription medicines abused in the order of importance in Nairobi were Valium, Panadol, Artane, Rohypnol, Cozepam, and Piriton while Mombasa had Valium, Rohypnol, Panadol, Piriton, Diclofenac and Methadone. Cozepam and Largactil were only abused by respondents in Nairobi while Diclofenac, Methadone and ARVs (HIV and AIDs) were abused only in Mombasa (Table 10). Valium abuse accounted for (41.4% and 17.3%) followed by Panadol (29.4% and 12.5%) and Rohypnol (6.3% and 12.2%) in Nairobi and Mombasa respectively. Age 26-30 years had the largest number of prescription medicine abusers. A higher number of valium abusers in the age group (26-30 years) was found in Nairobi accounting for 16.6 % followed by panadol at 9.4% while 31-35 years had 11.1% of valium abusers. However, in Mombasa those aged 31-35 years abused valium more (4.5%) (Figure 23, 24).

Table 8: Combination of emerging drugs with other drugs

	Nairobi County		Mombasa County	
	Percent	Std. Dev.	Percent	Std. Dev.
Emerging drugs	22.9	0.42	27.8	0.45
Bhang	23.1	0.42	33.2	0.47
Chang'aa	21.7	0.41	19.9	0.40
Tobacco	17.4	0.38	15.1	0.36
Miraa	14.0	0.35	8.5	0.28
Heroin	11.7	0.32	24.1	0.43
Alcohol	7.4	0.26	2.0	0.14
Cocaine	0.3	0.05	0.9	0.09
Others	17.4	0.38	5.1	0.22

Table 9: Drugs substituted with EDs in Nairobi and Mombasa County

	Nairobi County		Mombasa County	
	Percent	Std. Dev.	Percent	Std. Dev.
Alter ED	17.7	0.38	15.3	0.36
Tobacco	25.7	0.44	19.6	0.4
Chang'aa	18.3	0.39	8.8	0.28
Heroin	15.7	0.36	27.8	0.45
Bhang	13.1	0.34	28.4	0.45
Miraa	5.4	0.23	4.3	0.2
Alcohol	4.6	0.21	2.8	0.17
Cocaine	0.9	0.09	1.7	0.13
Morphine	0.3	0.05	-	-
Other	24.9	0.43	6.3	0.24

Table 10: Prescription medicine

	Nairobi		Mombasa		
	Freq	Percent	Freq	Percent	Std. Dev.
Valium	145	41.4	61	17.3	17.04
Panadol	103	29.4	44	12.5	11.97
Artane	27	7.7	10	2.8	3.45
Rohypnol	22	6.3	43	12.2	4.19
Piriton	17	4.9	35	9.9	3.60
Laroxly	10	2.9	-	-	2.02
Largactil	4	1.1	-	-	0.81
Serepax	5	1.4	2	0.6	0.61
Tap tap	1	0.3	-	-	0.20
Amoxy1	6	1.7	3	0.9	0.61
Morphine	1	0.3	-	-	0.20
Codeine	1	0.3	7	2.0	1.20
Methadone	-	-	13	3.7	2.61
Diclophenac	-	-	17	4.8	3.42
ARVs	-	-	8	2.3	1.61

Figure 24: Abuse of prescription medicine by age in Nairobi County

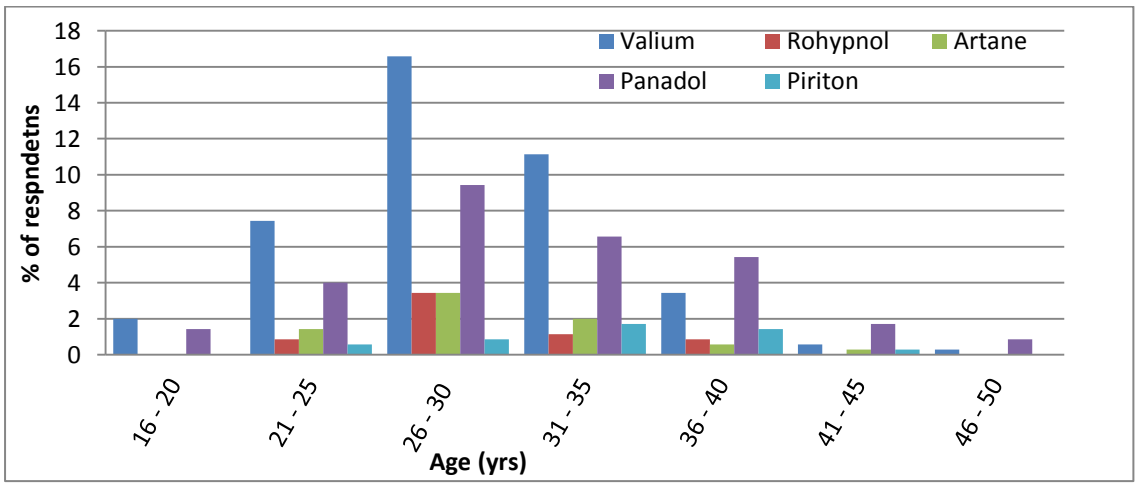
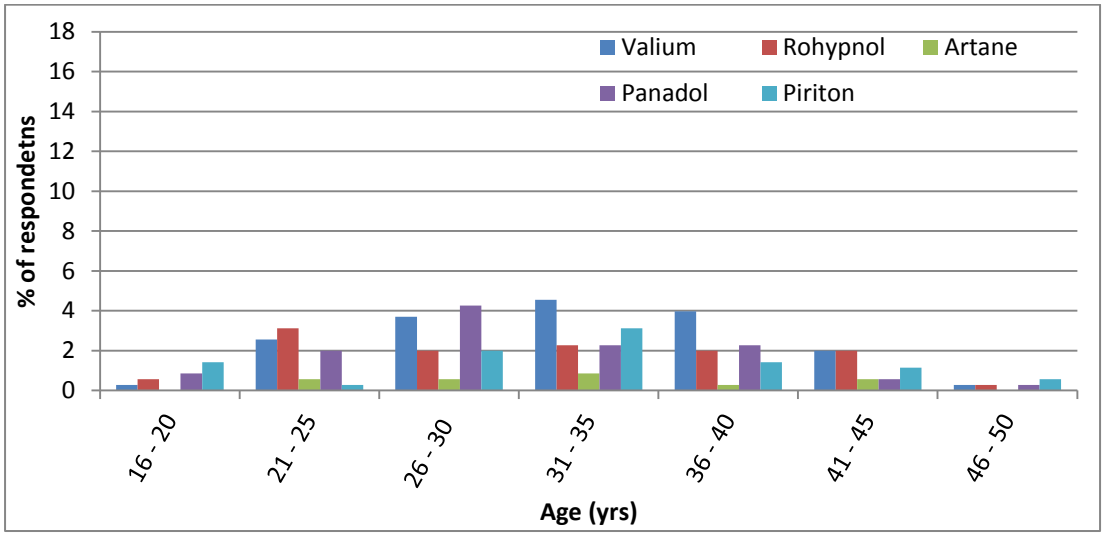


Figure 25: Abuse of prescription medicine by age in Mombasa



4.5: Response to drug injection and needle sharing

Heroin was identified as the most frequently abused drug followed by cocaine in Nairobi and Mombasa Counties. Typical injecting drug users were identified as males and females with Mombasa recording higher numbers than Nairobi County. The percentage of individuals who had ever injected heroin was 55.4% and 20.3% in Mombasa and Nairobi respectively. Those who had ever injected cocaine was 27.6 % and 6.6%, respectively (Table 11). A positive correlation of the respondents using both heroin and cocaine was observed in both counties at ($r=0.42$, $p<0.0001$) in Mombasa County. Approximately 21.9 % and 3.4 % were found to inject themselves with both heroin and cocaine. The number of injecting drug users had reduced in the last 12 months accounting for 52.6% heroin and 18.1% cocaine , (26.7% and 7.1%) in Mombasa and Nairobi respectively (Table 12). Significantly, a higher number of IDUs sharing needles was recorded in Mombasa on both heroin and cocaine accounting for 22.5% and 20.3%, than Nairobi with 5.6% and 5.5 % respectively over the past 12 months.

Significant number of respondents shared needles at $\chi^2 = 161.884$, $P<0.0001$ in Nairobi and $\chi^2 = 105.593$, $P<0.0001$ in Mombasa (Table 13). On the total number of Intravenous Drug Users (IDUs) in Mombasa, 22.5% and 20.3% shared needles when injecting with heroin and cocaine respectively. On the contrary, only 5.6% and 5.5% in Nairobi shared needles while injecting with heroin and cocaine respectively. There was a positive correlation between heroin and Cocaine injection and needle exchange in both Nairobi and Mombasa Counties. Positive correlation coefficient between needle exchange and heroin use was ($r = 0.644$, $P<0.0001$) in

Mombasa. This placed the individuals at increased risk of contracting HIV/AIDS and Hepatitis-C.

Table 11: Respondents who have ever injected heroin or cocaine

		Heroin		**Cocaine**	
County	Response	Frequency	Percent	Frequency	Percent
Nairobi	No	279	79.7	327	93.4
	Yes	**71**	20.3	**23**	6.6
Mombasa	No	157	44.6	255	72.4
	Yes	**195**	55.4	**97**	27.6

Table 12: Respondents who injected heroin (last 12 Months)

		Heroin		**Cocaine**	
County	Response	Frequency	Percent	Frequency	Percent
Nairobi	No	284	81.1	325	92.9
	Yes	**66**	18.9	25	7.1
Mombasa	No	167	47.4	258	73.3
	Yes	185	52.6	94	26.7

Table 13: Respondents sharing needles in Nairobi and Mombasa County

		Heroin needle exchange		
Nairobi	Response	No	Yes	Total
	No	267	12	279
	Yes	23	48	71
	Total	290	60	350
		$\chi^2 = 161.884$		P<0.0001
Mombasa	Response	No	Yes	Total
	No	132	25	157
	Yes	57	138	195
		198	163	352
		$\chi^2 = 105.593$		P<0.0001

4.5.1: Comparative analysis of heroin and cocaine abuse with age groups and education

Comparative analysis was done on abuse of heroin and cocaine with age where significant differences were observed between the counties. There was more abuse of cocaine in Nairobi at an early age. It was noted that out of the 97 participants 26.8% were in the age in group 26- 30 years followed by 22.7% in 21- 25 years group in Mombasa while in Nairobi, 21.6% of the total respondents (23) was in 31-35 years group followed by 17.3% in both 16-20 and 21-25 years groups. From Mombasa 36.6% of the total respondents (195) were in the 26-30 years group followed by 28.1% at 31-35 years while Nairobi respondents, 29.2% of 71 were in 26-30 years followed by 22.5% at 31-35 years (Figures 25, 26, 27, 28).

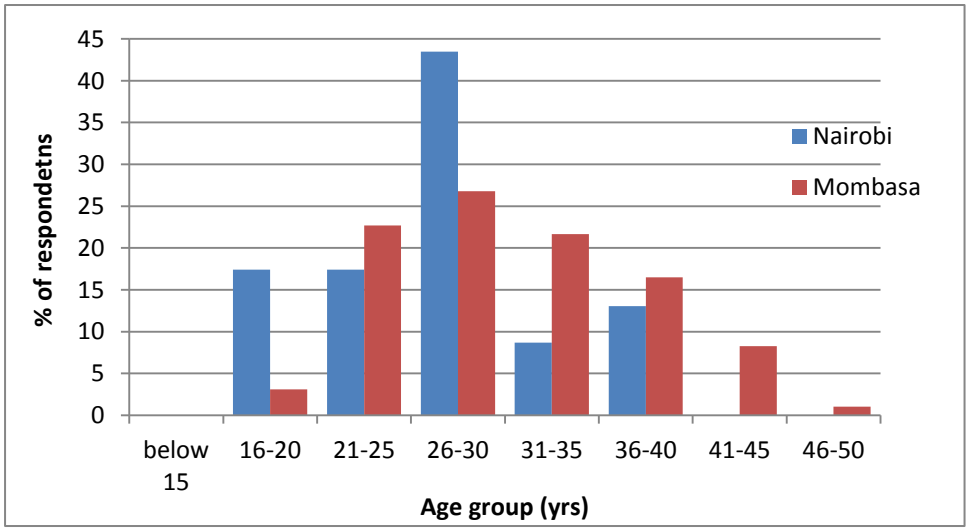


Figure 26: Comparison of cocaine abusers with age

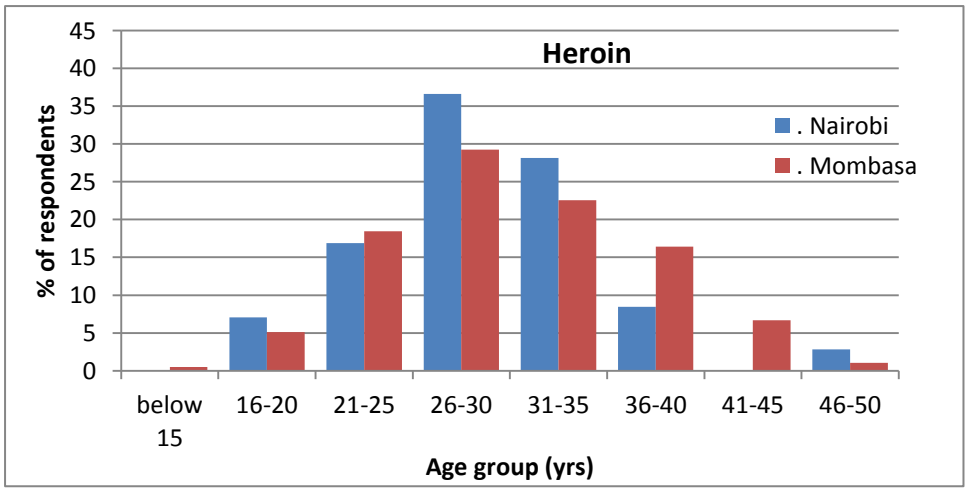


Figure 27: Comparison of heroin abusers with age

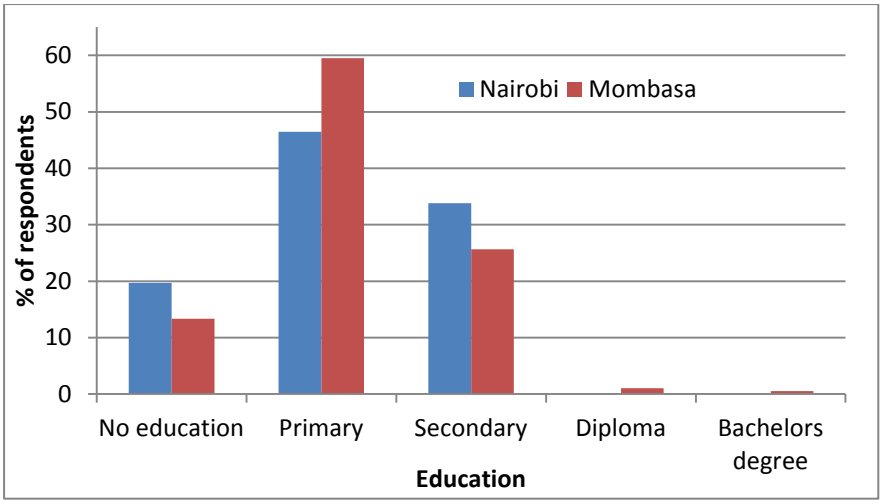


Figure 28: Comparison of heroin abusers with education

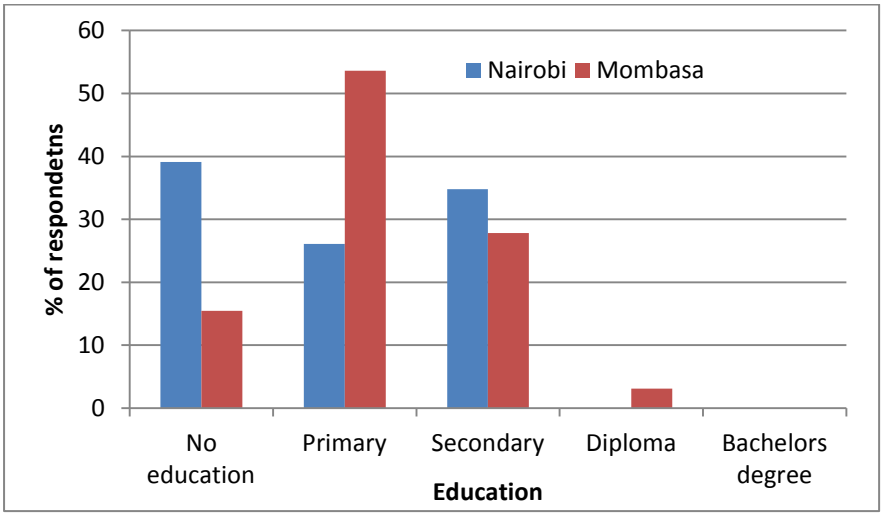


Figure 29: Comparison of cocaine abusers with education

4.6: Effects of drug abuse

Generally, drugs have numerous effects on the individual abuser, the family, community and the country at large. These include health, social, economic and political effects. Many of the respondents felt that drug abuse lead to stigmatization of the addicts from the family and community, many suffered from loss of finances through purchasing of drugs or being sacked from their workplace. A number of addicts suffered from serious withdrawal symptoms especially when they were not able to purchase the drugs or when drugs were not available. Some of the respondents complained of getting addicted to drugs while others suffered from problems of feeling lethargic and lazy. The respondents agreed that the emerging drugs had a lot of impact on the county security, economy, education, drop-out rate in schools, non-performance at the work place and reproductive health. Over 90 % of the respondents in

Nairobi agreed on the problems while in Mombasa around 70-80 % positively agreed that drugs had a lot of impact on the issues raised (Table 15 and 16). Over 50% of the respondents had visited the hospitals or health facilities in the last one month or one year (Table 14).

Most of the respondents were willing to stop abusing the drugs at 96.9% (±0.17) and 86.9% (±0.34) in Nairobi and Mombasa respectively. When the CAGE (C- desire to cut down, A- feel angry for drinking, G- feet guilty, E- use drugs as an eye opener) test was conducted, the respondents scored very highly on all the aspects which was a clear indication of their addiction (Table 18). Many disagreed that ADA is a private affair with 87% and 46% in Nairobi and Mombasa respectively. Most were in agreement that ADA affected individual's health, affected the county and that addiction was a disease (Table 17).

Table 14: Problems encountered as a result of drug abuse

	Nairobi		**Mombasa**	
	Percent	Std. Dev.	Percent	Std. Dev.
Drug conflict	98.6	0.12	76.4	0.43
Conflict family	96.0	0.20	87.2	0.33
Accidents	94.6	0.23	74.1	0.44
Police problems	94.0	0.24	80.7	0.40
Health problem	87.4	0.33	71.0	0.45
Arrest	71.7	0.45	72.7	0.45

Table 15: Social economic effects of emerging drugs

	Nairobi	**Mombasa**	**Std. Dev.**
Security	83.4	51.1	22.8
Economy	87.7	54.8	23.3
Education	81.4	74.4	4.9
School drop out	85.4	53.4	22.6
Non-performance at work	77.4	51.1	18.6
Reproductive health	74.9	48.6	18.6
Other sector	11.4	6.0	3.9

Table 16: Percent visits to hospitals and health centres

		Nairobi		Mombasa		
	Hospital visits	Freq.	Percent	Freq.	Percent	Std. Dev
	0	101	28.9	126	35.8	4.91
Last 1 year	1 - 3	133	38.0	114	32.4	3.97
	4 - 6	112	32.0	54	15.3	11.78
	6 - 9	-	-	15	4.3	3.04
	> 10	4	1.1	43	12.2	7.83
Last 1 Month	0	187	53.4	171	48.6	3.43
	1 - 2	153	43.7	118	33.5	7.21
	3 - 4	10	2.9	45	12.8	7.02
	5 - 6	-	-	14	4.0	2.81
	7 - 8	-	-	6	1.7	1.21

Table 17: Other ADA related issues

Other issues		**Nairobi**	**Mombasa**	
	Response	Percent	Percent	Std. Dev.
ADA is a private affair	Agree	8.3	46.9	27.25
	Disagree	87.8	46.9	28.92
	Nor sure	1.1	6.3	3.63
Effect of ADA on health	Agree	98.3	83.2	10.64
	Disagree	1.1	12.8	8.23
	Not sure	0.6	4.0	2.41
Does ADA affect County	Agree	98.0	89.2	6.22
	Disagree	0.3	5.7	3.82
	Not sure	1.7	5.1	2.40
Addiction is a disease	Agree	99.1	86.1	9.24
	Disagree	0.6	4.8	3.01
	Not sure	0.3	9.1	6.23

Table 18: CAGE test on respondents

	Nairobi		Mombasa	
	Percent	Std. Dev.	Percent	Std. Dev.
Cut down	90.6	0.29	70.5	0.46
Angry	79.4	0.40	75.0	0.43
Guilty	93.4	0.25	74.4	0.44
Eye Opener	93.7	0.24	84.9	0.36

4.7: Family related issues

Other family members were also reported as to be abusing various drugs. They included parents, spouses, and siblings. Amongst the siblings, brothers were abusing more with 30.1% and 28% registered in Mombasa and Nairobi respectively. This was followed by the father (Table 19). The members were known to abuse most of the commonly abused drugs and the preference differed between the Counties. Abuse of *chang'aa* was higher in Nairobi than Mombasa while *miraa* was higher in Mombasa. Abuse of both heroin and cocaine was higher in Mombasa while alcohol was higher in Nairobi (Table 20).

Table 19: Family members involved in drug abuse

	Nairobi		Mombasa	
	Freq.	Percent	Freq.	Percent
Brother	98	28.0	106	30.1
Father	65	18.6	33	9.4
Sister	39	11.1	30	8.5
Mother	33	9.4	21	6.0
Wife	5	1.4	17	4.8
Husband	2	0.6	12	3.4
Others	14	4.0	11	3.1

Table 20: Drugs abused by family members

	Nairobi		Mombasa		
	Freq.	Percent	Freq.	Percent	Std. Dev.
Chang'aa	99	28.3	57	16.2	8.55
Bhang	68	19.4	71	20.2	0.52
Miraa	65	18.6	80	22.7	2.94
Alcohol	54	15.4	30	8.5	4.88
Tobacco	32	9.1	42	11.9	1.97
Heroin	23	6.6	71	20.2	9.62
Cocaine	15	4.3	17	4.8	0.38
Others	8	2.3	19	5.4	2.20

4.8: Interventions to curb drug abuse

The abusers were aware of the dangers faced in drug abuse and suggested a number of interventions they thought would really help them get out of drug abuse. The respondents from Nairobi County felt very strongly on the need of interventions with over 60 % being recorded on each intervention. They strongly felt that the Government should set up of rehabilitation centres, start training programmes on ADA, establish Employee Assistant Programmes (EAPs), setup wellness centres, control selling of prescription drugs and even fixing stiff penalties on the drug peddlers and banning of advertisement on media among others (Table 21).

Other issues that were raised included building of more treatment and rehabilitation centres, provision of employment, introduction of stiff penalties on the drug peddlers and decriminalise drug addiction. A few felt that there is need to provide the addicts with clean needles and syringes as this would reduce on needle sharing and reduce on the prevalence of HIV and AIDS especially in Mombasa county where most of the abusers share needles when injecting heroin and cocaine.

Table 21: Types of interventions to curb emerging drugs and abuse

	Nairobi	Mombasa	Std. Dev
Treatment and rehab centres	96.3	87.5	6.2
Training programs on ADA	77.4	42.9	24.4

Put up posters	78.6	24.1	38.5
Wellness centres	78.0	18.8	41.9
Assistance programs	73.1	42.3	21.8
Stiff penalties on peddlers	71.7	42.0	21.0
Control sale of medicine	64.0	24.1	28.2
Employee Assistant Prog. (EAPs)	65.4	36.6	20.4
Ban advertising	63.1	21.6	29.4
Other interventions	2.9	1.7	0.8

4.8.1: The roles and responsibilities of the County

The respondents felt that the county roles should include the establishment of more rehabilitation centres, banning advertising and smoking and enforcing the ban on selling of prescription drugs over the counter without a prescription. The number agreeing on the issues was highly felt in Nairobi than Mombasa as indicated on the table by the Std. Dev, (Table 22).

The respondents felt that it was the responsibility of the county to establish the treatment and rehabilitation centres, visit education institutions, publicise issues of ADA, provide the IEC materials to the community in order to learn more on the dangers of emerging drugs and conduct campaigns on Emerging drugs and their dangers to the society. Most of the respondents felt that establishment of treatment and rehabilitation centres would go a long way in solving the problems of emerging drugs and accounted for 93.7% and 75% in Nairobi and Mombasa respectively. In Mombasa, the use of campaigns to curb the drug menace was the least with only 6.4% of the respondents against 66.9% in Nairobi, (Table 23).

Table 22: Role of the Nairobi and Mombasa Counties

	Nairobi	**Mombasa**	**Std. Dev**
Establish rehabilitation centres	93.7	83.5	7.21
Ban advertising	57.7	21.9	25.34
Control over counter drugs	57.4	28.7	20.32
Ban smoking	55.4	21.3	24.13
Do away with drug abuse	32.9	31.3	1.14
Don't know	9.4	7.1	1.64
Nothing	2.6	2.0	0.41
Others	2.3	3.4	0.79

Table 23: County responsibility in curbing emerging drugs menace

	Nairobi		Mombasa	
	Freq.	Percent	Freq.	Percent
Establish rehabs	328	93.7	264	75.0
Poster use	264	75.4	128	36.4
IEC material	245	70.0	161	45.7
Campaigns	234	66.9	26	7.4
Advertisement	234	66.9	114	32.4
Visit educ. Inst	218	62.3	148	42.0

4.9: Rehabilitation centres

The respondents were aware of rehabilitation centres that offered the addicts help. The rehabilitation centres mentioned included: SAPTA (28.6%), Maisha (18.6%) and NACADA (11.7%) in Nairobi while in Mombasa, Mewa rehabilitation centre (31.5%), Reach out (28.4%) and Bomu hospital (5.1%) were mentioned. It was interesting that only 0.2% of the respondents mentioned Mathari hospital in Nairobi as a rehabilitation centre. A large number of the respondents were not aware of any rehabilitation in Kenya accounting for 30.9% and 24.1% in Nairobi and Mombasa respectively (Table 24).

Table 24: List of major rehabilitation centres known by respondents

Nairobi	Percent	Mombasa	Percent
SAPTA	28.6	Mewa rehab	31.5
Maisha	18.6	Reach out	28.4
NACADA	11.7	Bomu hospital	5.1
NOCET	4	Omari project	2
Asumbi	2	DATC Coast province	1.7
Mathari hospital	0.2		
Did not know	30.9	Did not know	24.1

4.10: Focus Group Discussion

There were two Focus Group Discussions (FGDs), one in Mombasa which comprised of 10 recovering addicts (one man and nine Female) while the Nairobi FGD had 4 women and 6 men all in recovery. Most of the women were unwilling to participate.

The FGD in Mombasa mentioned the following emerging drugs. Mao (mixture of tobacco and tambuu) from Pakistan, which is used mainly by people of Asian extraction but seems to be gaining momentum among indigenous communities along the Coast. Kukumanga which is a seed from a 'macadamia' like plant which traces its roots from Zanzibar and it is used mainly because of its high stimulation and potent sexual stimulating capacity. *Shashaman* is bhang from Ethiopia and used by anyone who uses marijuana and can get access to it. Rohypnol *(Bugizi)* is sold in liquid form and used as a substitute for heroin and administered through injecting. *Masi* is sold in tablet form.

Shisha which is a derivative of tobacco is smoked through a water pipe and usually sold in different flavours such as vanilla, strawberry or apple. This is used mainly by the affluent class in Nyali and Tudor and its quickly gaining momentum among the youthful folk. Hash oil looks like tar and it is abused by oiling the cigarette and smoked. *Kuber* is a traditional flavour scented tobacco mainly used by the Indians and its usage is widespread in Mombasa. *Majani* Chai is a drug rolled in rizla paper and used as an alternative to marijuana and it was said to have a higher stimulating effect than marijuana.
Mshomoro is a wild plant growing naturally at the Coast, whose leaves are used as substitute to marijuana. Crack is black powder prevalent among sea-men in Mombasa County and it is used like bhang. *Afyun* is known as a waste product of opium and looks like normal ash whose origin is South Africa. Petrol fumes are used mostly by Mombasa residents because of its high stimulant effects. *Dongo sinyo* is a waste product of opium poppy plant. In Nairobi, the Focus Group Discussion (FGD) noted that there were different drugs as compared to Mombasa. They included; Rohypnol which is commonly used by most commercial sex workers to give them courage to face strangers and steal from them through spiking their alcoholic drinks. The drug is also used by the IDUs to help them calm down.

Along the streets of Nairobi, Rohypnol was also used as a date rape drug, by ''non-addicts' such as pick-pockets and thieves to gives them extra courage to accomplish hard tasks of violent robbery. *Kukumanga* (cloves) was also common and used for sexual enhancing by both men and women alike. *Kaunda* from Ethiopia is smoked like bhang or chewed and its side effects include nose bleeding and headaches if taken in higher dosages. Artane is mostly used by Miraa users. *Dibi* commonly dubbed '*Usinionjee*' or '*utanitafuta*' is a drug obtained from a mixture of Heroin, Rohypnol, cozepam, artane and largactil, and was mostly found in Kangemi

where it was used by drug abusers suffering from withdrawal symptoms of heroin. The drug was found prevalent among commercial sex workers in the slum areas of Nairobi. *Daba* is obtained from the mixture of Bhang, Rooster, Ristler and Artane with its origin being Nigeria and was widespread in Mathari (Nigeria Zone). Others included *kamusi*, Car petrol and *Dorome.*

The FGDs observed that the emerging drugs were preferred to mainstream drugs because they are legal, 'give a high', have long lasting high, cheap, readily available, tolerated by the society and can be used anywhere without raising suspicion e.g. hash oil.

The EDs lead to crime, domestic violence, HIV infection especially in Mombasa due to the sharing of needles e.g. usage of rohypnol, Kukumanga and *mshomoro* were associated with marital breakdown due to the excessive sexual libido. *Daba* and *Dibi* were associated with poor eating habits leading to poor health. *Dibi* was associated high serious addictions hence the street saying, '*usinionje*' '*utanitafuta*'. *Kaunda* was associated with adverse health effects especially when used in higher dosages including nose-bleeding and headaches.

4.11: Key informants

The key informants included representatives from NACADA, Coast Provincial General Hospital, Reach-out Centre, Asumbi treatment Centre and Dagoretti Youth Welfare Organization. The outreach workers at Reach out Trust Centre traced the history of emerging drugs problem back to 2007 while a recovering addict traced the EDs to 2008 which have also acted as gateways to harder drugs. The informants also noted that the EDs are largely gaining momentum with rapid industrialization.

The key informants stated that ED use is an emerging problem in Mombasa and Nairobi County with the age of drug onset largely being estimated at 12 years for Mombasa and 15 for Nairobi. Its magnitude is apparent though no solution has been found. The driving factors were identified as availability of drugs, curiosity, bad company through peer pressure, show-off, accessibility, peer pressure, idleness, presence of Pan shops (special shops for Indians) which was unique with Mombasa County, curiosity, school drop-outs, ignorance, lack of family role models, unemployment, crime, prostitution and unstable families.

The drugs identified in decreasing order in Mombasa were *Mau, Kuber, shashaman, Tambuu, Popo, kukumanga, shisha* and *mshomoro*. In Nairobi *Shisha, tap tap and Kuber* were ranked highest as consented by recovering addicts based in Kawangware. Some of the drugs were used as substitutes by recovering addicts. The drugs were found to be readily accessible from the shops (pan shops), streets, kiosks and drug dens with hotspots commonly found in Mombasa County. However, in Nairobi, the EDs were made available by peddlers who sold them in various places. The targeted group were the school going children, youths and young adults where school going children were sold to the drugs during break-time and after school and during weekends. They were also sold hash oil. The drugs were also abused at the work-place and during religious celebrations

Present preventive actions mentioned by the key informants in both counties included alcohol and drug abuse awareness programs in schools and chief's *barazas*. In Nairobi, the outreach done by NGOs and awareness programs by NACADA including a toll free help-line where people can call at any time of the day for 24/7was said to be welcomed though is a drop in the ocean considering the magnitude of drug abuse and the number of people affected. Other actions mentioned included health talks and set up of treatment and rehabilitation centres e.g. Mewa and the Reach-out centre.

The key informants were of the opinion that some of the measures that could be put in place to curb EDs should include use of strict law enforcement at all levels, school health sensitization, community sensitization and capacity building for teachers, religious leaders and law enforcement agents. The government through NACADA ought to work with the opinion leaders at the grass-root level to tackle EDs by strengthening awareness programs, counselling and establishment of drop-in and cheap rehabilitation centres.

CHAPTER FIVE: DISCUSSION

From the survey conducted from 702 respondents from Nairobi and Mombasa counties, it is quite clear that there are many emerging drugs in the country. A total of 42 drugs were reported with Nairobi County recording higher numbers than Mombasa. This could be due to internet access and the higher level of education of respondents. According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), the number of these new drugs has risen from 13 in 2008 to more than 70 while the number of websites selling them has rocketed from 170 to 690 in the last two years.

Some of the factors leading to the rapid growth in use of the emerging drugs are the fact that they are legal and readily available and easy to get hold of on the streets, smart shops, chemists, convenience stores and on the Internet. The respondents also stated that the emerging drugs gave them what they called 'a high' and a 'longer high' with less consumption. From the research findings many young people are using the emerging drugs to get 'a quick high' with less money. The drugs were also highly accessible, affordable, touted as legal and perceived as safe. They evade drug testing and are inadvertently promoted through the media. Similarly, in Europe it was observed that many young people turn to alternative or synthetic drugs because of a belief that they're a legal substitute for popular street drugs and are more readily available through legitimate sources, such as gas stations, convenience stores, gardening/plant stores and online. They're also frequently thought to be safer than harder drugs. The rapid rise in their popularity is also attributed to Internet accessibility and information.

Our concerns with most of these new drugs revolves around the fact that they have not been in use long enough for researchers to be able to assess their long-term health effects on the abusers. Similar statements were expressed atthe Major Swansea conference on legal highs and new and emerging drugs and also by the National Institute of Drug Abuse (NIDA). This is because some act as substitutes of opiods and cathinones and work in the brain as stimulants, depressants or hallucinogens. Some of the prescription drugs abused by the respondents were opioid pain relievers (Oxycontin), stimulants and depressants for relieving anxiety (Valium) or hallucinogens (Psychedelics).

Those abusing prescription and OTC drugs were aware of their addictive effects and they were at risk of adverse health effects if taken together with other drugs or alcohol.

From the survey, it was noted that most of them were combining the prescription medicine with the emerging drugs and/or alcohol. Research shows that the opioids are particularly dangerous, especially when they snorted or injected or combined with other drugs or alcohol. *Shisha* is usually filtered using water, bhang or cocaine depending on the customer's preference. The great danger is that no information is available on what chemicals are in these emerging drugs and their combinations, how pure they are or what effect they have on the abusers.

The emerging drugs are purchased and used for their drug-like effects. The brand names and product contents (obtained through mixing) have no studies to track potency or side effects and may present serious health effects. It is also difficult to establish potential harm of the emerging drugs due to lack of pharmacology and toxicity information. Similar sentiments were echoed by NIDA. The contortions of stimulants, depressants, prescription medicine and hard drugs could pose more harm than that of the commonly abused drugs. It was observed that people abused cocaine at an early age in Nairobi than Mombasa. A number of abusers injected themselves with heroin and cocaine thereby increasing their chances of contracting HIV and Hepatitis C infections (Xian *et al*., 2008; Chitwood *et al*., 2003; Nelson *et al*., 2002).

Shisha is the drug for the young unlike kuber which was abused by older people as observed in Nairobi and Mombasa. Hu *et.al*. (2008) observed that 35% of the college students were abusing *shisha*. Other similar observations have been recorded in other regions of the world (American Lung Association, 2007; CDC, 2009; Alk *et al*., 2010). *Shisha* abuse was more prevalent in Nairobi than Mombasa. Within the Districts, *Shisha* was abused more in Westlands and Eastlands in Nairobi, and Mvita and Changamwe in Mombasa. *Shisha* flavours like mint, strawberry, watermelon, vanilla, capuchino, apples and lemon reduces the harshness of tobacco. Thus there is need to conduct more studies from all the Counties in order to have accurate numbers on the prevalence. The use of *shisha* is on the increase as evidenced by the high percentages in both counties where some respondents even had the hookah/bong at home. The smoke is filtered through water, cannabis or heroin depending on the customers' preference.

Shisha also referred to as, *goza, hubble-bubble, borry, arhile, narghile,* or the *'cocaine of the poor'* has spurred concerns among medical experts. Researchers have pointed out that coal or

charcoal used in hookah smoking may be hazardous, introducing dangerous substances into the smoke. According to research carried out by the WHO, one hour of smoking a hookah pipe exposes the user to 100 to 200 times the volume of smoke from a single cigarette. This is due to high frequency of puffing, depth of inhalation and length of the smoking session, El-Hakim *et al*., 1999). The smoke has high levels of carcinogenic benzene, arsenic, lead and nickel, 36 times the tar of a single cigarette and 15 times that of carbon monoxide. The heated shisha leads to production of toxic Volatile Organic Compounds (VOCs) and Polycyclic Aromatic Hydrocarbons (PAHs). Some PAHs are highly carcinogenic and can cause lung cancer.

Shisha smokers are at risk of same kind of diseases as those caused by cigarette smoking, which include oral cancer, lung cancer as a results of nicotine and carbon monoxide inhalation; stomach and oesophagus cancers, Chronic Obstructive Pulmonary Disease (COPD) as well as reduced lung function and decreased fertility (Nuwayhid *et al*., 1998). It was observed that a number of young women in the reproductive age were smoking *shisha*. Nuwayhid *et al*. (1998) observed women who smoke one or more water pipes a day during pregnancy give birth to babies with lower birth weights than those born to non-smokers and were at an increased risk for respiratory diseases.

The respondents reported that they shared the mouth pieces during the smoking sessions. Akl *et al*. (2010) observed that infectious diseases such as oral herpes, tuberculosis (TB) or hepatitis infection may be transmitted by sharing a mouth piece. In the Middle East, tuberculosis outbreak was positively linked to *shisha*. Other studies suggest that *shisha* smokers are at higher risk of developing gum disease than cigarette smokers and five times more likely to develop gum disease than non-smokers. Second hand smoke from *shisha* poses a serious risk for non-smokers, particularly because it contains smoke not only from the tobacco but also from the heat source (e.g., charcoal or coal) used in the hookah (WHO, 2005). According to Centre for Disease Control (CDC), *shisha* smoking carries many of the same health risks as cigarettes. Carcinogenic benzene exposure has strong links to leukaemia. Studies have shown that shisha smoking increases the chances of periodontal disease, and may be associated with adverse cardiovascular effects, such as tachycardia and increased blood pressure.

WHO (2010) released advisory statements indicating that many of the long-term adverse consequences of *shisha* smoking, include increased risk for cancer that mimic those of cigarette smoking.

Availability, affordability and accessibility of emerging drugs in the outlets were identified during the study. Therefore, by creating departments within the Counties, strengthening NACADA, providing regular follow up ADA trainings and awareness raising activities to all stakeholders especially the youth on the concept of demand reduction, and displaying IEC materials that would serve as promotional material are recommended to decrease availability and usage of drugs in the Counties.

5.1 Conclusions

In conclusion, with the problem of the emerging drugs being on the increase, the Government must remain vigilant. For this to happen, continued investment on legislation, policies, research, trainings, establishment and expansion of treatment and rehabilitation centres, and development of Employee Assistant Programmes (EAPs) is vital. There is urgent need for the Government to be prepared for the emerging drugs and the associated physical and psychological health problems and their drain on health services. This was evidenced by the high number of visits to the health clinics as observed during the survey where over 50% of the respondents had visited a health clinic in the last one Month.

All stakeholders, parents, Schools, Colleges, Universities, Government agencies including NACADA, and public health need to be on the lookout for these emerging drugs also referred to as the ‘legal high’ and find ways on how to deal with a growing list of synthetic, designer and emerging drugs.

5.2 Recommendations

In the assessment, the types of emerging drugs, availability, affordability, and accessibly in numerous outlets of these drugs was covered. Based on the findings the following recommendations are forwarded to help in the reduction of the emerging drugs in Kenya.

1. There is urgent need for continuous monitoring to identify emerging drugs and investigate their chemical constituents. This would provide evidence based approaches towards their regulation and control.

2. There is need for continuous public education and awareness on the effects of emerging drugs by the relevant agencies. Such information would cushion the public against the adverse effects of such drugs.

3. There is need to establish regulatory regime for substances where one is required to determine their safety before they are introduced to the consumers. Such measures may mitigate the harmful cycle of emerging drugs being sold.

4. The sale of emerging drugs and substances of abuse that are sold legally e.g. *shisha* and *kuber* should not be accessed by minors and should be compelled to adhere to specific labelling requirements.

6.0 REFERENCES

Akl, E. A., Gaddam, S, Gunukula, S. K., Honeine, R., Jaoude, P. A., and Irani, J. 2010. The Effects of Water pipe Tobacco Smoking on Health Outcomes: A Systematic Review. International Journal of Epidemiology; 39:834–857

Albert, M. R. and Ostheimer, K. G. 2002. The evolution of current medical and popular attitudes toward ultraviolet light exposure: part 1. Journal of American Academic Dermatology. 47:930–7.

American Lung Association. 2007. An Emerging Deadly Trend: Water pipe Tobacco Use. Anderson, D, Beckerleg, S, Hailu, D, and Klein, A. 2007. The khat controversy: stimulating the debate on drugs. Berg Publishers.

Bashford, A, and Levine, P. 2010. The Oxford handbook of the history of eugenics. Oxford University Press.

Bivins, R. 2008. Alternative medicine? A history. Oxford University Press,Caliendo, M., and Kopeing, S. 2008. Some Practical Guidance for the Implementation of Propensity Score Matching. *Journal of Economic Surveys* , Volume 22 (31-72).

Capitanio, M, Cappelletti, E, and Filippini, R. 1989. Traditional antileukodermic herbal remedies in the mediterranean area. Journal of Ethno-pharmacology. 27:193–211.

Carden–Coyne, A. 2009. Reconstructing the body: classicism, modernism, and the First World War. Oxford University Press.

Centre for Disease Control and Prevention. 2009. Tobacco Use Among Students Aged 13–15 Years—Baghdad, Iraq, 2008. Morbidity and Mortality Weekly Report. 58(12):305–308.

Charlier, P., Poupon, J., and Huynh–Charlier, I. 2009. Fatal alchemy. BMJ; 339:5311.China, National Narcotic Control Commission, 2009 Chinese Journal of drug abuse, prevention and treatment. 2011

Chitwood, D. D, Comerford, M., Sanchez, J.S. 2003. Prevalence and Risk Factors for HIV among Sniffers, Short-Term Injectors, and Long-Term Injectors of Heroin. J Psychoactive Drugs, 35:445-453.

Creswell, J. 1994. Research Design: Qualitative and Quantitative Approaches. London: Sage

Curth, L. H. 2006. From physics to pharmacology: five hundred years of British drug retailing. Ashgate Publishing Limited.

El-Hakim Ibrahim E., and Uthman Mirghani, A. E. 1999. Squamous Cell Carcinoma and Keratoacanthoma of the Lower Lips associated with "Goza" and "Shisha" Smoking. International Journal of Dermatology; 38:108-110

Evans-Brown M., Bellis M. A., and McVeigh J. 2011. Should “legal highs” be regulated as medicinal products? British Medical Journal. 342:1101

Gilman, S. L. 2001. Making the body beautiful. Princeton University Press.

Grocott's Mail. 2011. Kuber tobacco and the informant. South African Independent Newspaper.14th September, 2011.

Haiken, E. 1999. Venus envy: a history of cosmetic surgery. Johns Hopkins University Press.

Hau, M. 2003. The cult of health and beauty in Germany: a social history, 1890–1930. University of Chicago Press.

Hirshbein, L. D. 2000. The glandular solution: sex, masculinity, and aging in the 1920s. J. Hist Sex. 9:277–304.

Hu Xingdi, Brian A Primack, Tracey E Barnett, and Robert L Cook. 2011. College students and use of K2: an emerging drug of abuse in young persons. Substance Abuse Treatment, Prevention, and Policy 6:16.

Kevles, D. 1998. In the name of eugenics: genetics and the uses of human heredity. Harvard University Press.

Langenbucher, J. Hildebrandt T. and Carr, S. J. 2008. Medical consequences of anabolic steroids. In J. Brick (Ed.), Handbook of the medical consequences of alcohol and drug abuse (pp. 385–421). New York: Haworth Press.

Marshall, E. 1988. The drug of champions. Science, 242, 183–184.

Mooney, J. 1896. The mesacal plant and ceremony, Therapeutic Gazette, 12: 7-11.

Nachmias, G. and Nachmias, D. 1996. Research Methods in Social Sciences. 5th Edition. Arnold, London.

Nelson K.E, Galai N, Safaeian M, Strathdee S.A, Celentano D.D, Vlahov D. 2002. Temporal trends in the incidence of human immunodeficiency virus infection and risk behavior among injection drug users in Baltimore, Maryland, 1988-1998. Am J Epidemiol. 156 :641-653.

Nuwayhid, I, Yamout, B., Ghassan, and Kambria, M. 1998. Narghile (Hubble-Bubble) Smoking, Low Birth Weight and Other Pregnancy Outcomes. American Journal of Epidemiology; 148:375–83

Report Series. 1973. National Clearinghouse for Drug Abuse Information, Mescaline, Series 15, No.1, May 1973.

ROK/United Nations International Drug Control Programme (UNDCP) 1994. Needs Assessment Study.

Stephen, A. Maisto, Mark Galizio, and Gerard J. Connors. 2008. Drug Use and Abuse, Sixth Edition Wadsworth, Cengage Learning.

Stephen, A. Maisto, Mark Galizio, and Gerard J. Connors. 2011. Drug Use and Abuse, Sixth Edition Wadsworth, Cengage Learning., 2008

Steve, B. 1998. Drug Abuse handbook. CRC Press LLC,

World Health Organization. 2005. Tobacco regulation advisory note: Water pipe tobacco smoking: health effects, research needs, and recommended action by regulators. Available at: http://www.who.int/tobacco/global_interaction/tobreg/Final.pdf

World Health Organization. 2005. Tobacco Regulation Advisory Note. Water Pipe Tobacco Smoking: Health Effects, Research Needs and Recommended Actions by Regulators. Geneva: World Health Organization, Tobacco Free Initiative, 2005

Xian, X., Jun L., Jianling B., Rongbin Y. 2008: Epidemiology of hepatitis C virus infection among injection drug users in China: Systematic review and meta-analysis. Public Health.122:990-1003.

Young A. M, Havens J. R., and Leukefeld C.G. 2010. Route of administration for illicit prescription opioids: a comparison of rural and urban drug users. Harm Reduction Journal 2010, pg 2-7:24 http://www.harmreductionjournal.com/content/7/1/24

Zweiniger–Bargielowska, I. 2010. Managing the body: beauty, health, and fitness in Britain 1880 1939.Oxford University Press.

APPENDIX I

List of emerging drugs

1. Shisha - flavored tobacco
2. Kuber
3. Kungumanga (seed from a marble shaped ‘ hard drug fruit’)
4. Kachuri (Glue mixed with tobacco)
5. Mkorogo (Heroin, chang’aa and rohypnol)
6. Shashaman (Ethiopian, marijuana)
7. Artane (prescription medication)
8. Kamusi (Car petrol)
9. Rohypnol (prescription medicine).
10. Dibi (heroin, largactil and rohypnol)
11. Jagamaster (Ethanol and jet fuel)
12. Tap tap (sleeping pill)
13. Jet fuel
14. Tambuu (Betel) (areca nut, tobacco and Magadi soda)
15. Mau (used the same way as tambuu)
16. Yee (Boiled formalin and coins)
17. Laroxyl (prescription medicine)
18. Lego (pill contains 12% MDMA and methamphetamine derivatives)
19. Gotika (drug that resembles Kuber)
20. Daba (Bhang, rooster and artane))
21. Largactil (prescription medicine)
22. Tot (jet fuel, heroin and cocaine)
23. Musi (Paint thinners, glue, petrol and formalin)
24. Red devil (prescription medicine)
25. Mayee
26. Zingzing (Solid substance chewed like Kuber)
27. Cocktail (heroin, chang'aa and bhang)
28. Tarnine (shoe polish and tar)
29. Chavis
30. Matigasi (Changaa and ethanol)

31. Alto 10
32. Green mamba or black mamba (Spice or K2)
33. Santuri (heroin and valium)
34. Grass ash (Bhang and ash from a certain weed (datura?))
35. Tangatanga (carbon vapour e.g. in acetone, toluene, chloroform)
36. Mshomoro (plant found at the Coast and used like marijuana)
37. Don't touch me (placed on the tongue or skin)
38. Roy (Rooster, bhang and heroin)
39. Kashata (Glue, ugoro and chang'aa)
40. Pumbaa (Kungumanga and vinegar)
41. Dongosinyo (Waste products from poppy plant)