

involve students to bring more focus onto content and enhance students' motivation to complete their coursework and reach their desired diplomas, while helping them regulate their psychological reactions to this change. Students' reflections revealed that tasks that implied practical work ranging from the simple group projects to group research and school visits seemed to promote positive feelings, confidence, and perseverance to accomplish desirable outcomes.

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### Next Priorities for Intervention in Kenya: Results from a Cohort Study of Drug Use, HIV and HCV Patterns in Five Urban Areas

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#### Abstract

In Kenya, alcohol, cigarettes, Khat (miraa) and cannabis sativa, have remained the most popular abused substance and have been linked to increasing rates of HIV/HCV. This study's objective was to identify the types, frequency, and methods of substances used and their relationship to HIV and HCV seroprevalence among substance abusers in five representative Kenyan cities. *Methods:* Purposive and snow-ball sampling was used. Among 1420 substance abusers, psychosocial and substance use factors were assessed, with a subset of 120 tested for HIV and Hepatitis C Viral (HCV) infection. *Results:* In five Kenya cities, the highest oral daily consumption of the drugs was recorded in Malindi (83.3%) and Mombasa (56.6%). Snorting and sniffing was used on a daily basis mainly in Mombasa (85.0%) followed by Nakuru (72.7%) and Nairobi (70.6%). Malindi exclusively practiced injection of drugs on a daily basis with a one-day prevalence rate of 100.0%, followed by Mombasa (86.5 %) and Nairobi (67.9%). Across the five cities, the most prevalently substance abused was Alcohol (36.3%) followed by nicotine (17.5%), Cannabis sativa (9.9%), Heroin ( 8.0%), Khat whose active ingredient is Catha edulis (2.8%), and cocaine (2.2%) and the most popular route of intake was oral (45.7%), nasal (38.7%) and injection (10.4%). Of the 120 tested for HIV and HCV, approximately 61% were seropositive for Hepatitis C and 42% for HIV and 85% were Injection

Drug Users (IDUs). Interestingly, of these IDUs, 49.5% tested positive for HIV and 70.29% tested positive for Hepatitis C (HepC). These results support a relationship between IDU behavior and HIV/HepC and the need for an IDU-focused prevention effort that would 1) integrate sexual and injection behavior risk reduction, 2) identify and complement local cultural strengths, and 3) link Kenya's nascent democratic governance initiatives with building the necessary IDU prevention infrastructure.

#### Introduction

In Kenya, alcohol, cigarettes, Khat(miraa) and cannabis sativa, have remained the most important drugs abused followed by solutes and prescribed drugs with fast emerging trends of injecting drug use, especially the narcotics. Nearly all the studies done in Kenya on drug and substance use, however, have been school or community based general populations (Ndetei, Ongecha, Mutiso (2005), Dhadphale, et al.,(1982), Yambo, Acuda,(1983), Kuria, (1993), Ndetei, et al. (1997). The Trend data indicate a near doubling of the rates of drug use among adolescents in the early 1990s (Bravender, Knight, 1998). Alcohol and substance abuse is further associated with increased dropout from school, poor scholastic attainment, drunk-driving, delinquency, early pregnancy and family difficulties (Friedman, et al.(1996), Kokotailo, et al.(1992). The study that we report on here is cohort-based and specific to abusers identified from rehabilitation and treatment centers, hospitals, streets and drug dens, within five urban areas. Our aim is to provide a basis for more finely tuned priorities and measures of prevention interventions related to the destabilizing risk triangle of drug use, HIV and HCV.

Specifically, the use of drugs of injection is associated with risk of contracting HIV/AIDS, hepatitis B and C infections, tuberculosis and sexually transmitted diseases. In South Africa an epidemiological study (Parry et al. (2002) revealed alcohol, cannabis and mandrax (methaqualone) as the most frequently reported abused drugs. They comprised the largest proportions of drug-related arrests, psychiatric diagnoses and drug-positive trauma patients. A significant increase in indicators for cocaine/crack and heroin occurred in two sites in the same period. They also noted that the use and burden of illicit drugs appeared to be increasing (Parry, et al 2002, 2005) However a prospective study to monitor heroin nature and extent of heroin user identified the users to be white males, aged 21-24 years who smoked rather than injected (Parry, et al., 2002, 2005). A number of other studies within the continent have focused on the sexually transmitted infections (STIs) as a major risk factor for HIV transmission with HIV/STI co-infection rates as high as 30% and HIV prevalence rate of 21.9%. Yet the authors could not fully explain the higher HIV prevalence from the STIs and behavior change among this low risk group. Though, we may suspect based on other data and studies reviewed by O'Leary (2000), that even if women are proactive in their general health care, they may not have the means to negotiate their sexual health with their male partners.

HIV infection associated with injecting drug use exists in all regions and is a growing problem (UNODCP, 2002). More and more countries are reporting cases of injecting drug use from 80 countries in 1992 to 136 in 1998. Of these 136, 114 of them have reported HIV cases as a result of injecting drug use. At the global level, some 22% of the world's HIV/AIDS population injects drugs. The joint United Nations Program on HIV/AIDS estimates that the global proportion of HIV infections due to contaminated injection equipment was 5-10% in 1996 (UNAIDS 2002).

Reasons for this IDU increase include, migration of indigenous drug users; involvement of locals in the cultivation or manufacture of drugs; living along a drug trans-shipment route; change in the form of drug to make it more easily injectable; geographical proximity to a country or region where injecting is commonplace and availability of other forms of drugs (UNODCP, 1997).

The largest international comparative study on injecting drug use and HIV infection (The WHO Drug Injecting Study Phase I) was undertaken in 12 cities (Athens, Bangkok, Berlin, Glasgow, London, Madrid, New York, Rome, Rio de Janeiro, Santos, Sydney and Toronto). It comprised 6390 drug injectors mainly outside drug treatment settings. The results indicated that IDUs were mainly males, predominantly 20-34 years of age (80-90%); single, never married, widowed, separated, divorced (88-90%); childless or, at most with one child. Over 50% had less than ten years of full-time education and majority were unemployed. Between 0-40% were living with a current sexual partner, while 4-35% were homeless. In each center more than 50% of IDUs had been in prison or jail overnight at least

once. The study also identified the proportion of IDUs having blood (or saliva) tests, showing laboratory signs of HIV infection in which low seroprevalence (<5%) was seen in Glasgow, Toronto, and Sydney; medium (5-20%) in London, and high (>20%) in New York, and Bangkok (WHO, 1994). Similar findings were reported among 282 regular young drug users (using heroin, cocaine, methadone and/or amphetamines at least 3 days/week) in Amsterdam where HIV prevalence among those who had injected drugs was 16.2% and only 1.8% for those who had never injected (Welp, et al. 2002).

However, this contrasted with the Vancouver Injection Drug Users Study (VIDUS), found that the young (13-24 years of age) injectors (N=232) were more likely to be female; work in the sex trade; report condom use; inject heroin daily; smoke crack cocaine daily; and need help injecting unlike in the WHO studies that majority were males. HIV prevalence at baseline among the youth was 10% (Miller, et al 2002).

In Kenya, a rapid assessment on IDUs was carried out in 2001, which estimated a total of 5000 heroin injectors in Nairobi but did not ascertain their HIV serostatus (Odek-Ogunde, 2001). This study aims to fill that gap by identifying the types, frequency, and methods of substance used and the relationships of these factors to HIV and HCV seroprevalence among cohorts of substance abusers in five representative Kenyan cities.

## Methods

### Study Sites

The study sites selected were the main commercial and urban centers consistent with other worldwide findings in which the highest levels of drug abuse were found in the major urban centers (World Health Organization). Some of the common characteristics of the urban centers included being well connected to each other by air, road and partly sea, their cosmopolitan nature and their high level contacts with other continents through tourism among others. Mombasa and Malindi are coastal towns, Nairobi the capital city and Nakuru and Kisumu are much more inland.

### Methodology

This was a descriptive, cross-sectional study of identified abusers (N=1420) in five major urban centers in Kenya, namely Mombasa (n=350), Malindi (n=183), Nairobi (n=364), Nakuru (n=246) and Kisumu (n=277). The study population included active and former substance abusers, either HIV positive or negative, found in rehabilitation and treatment centers, streets, and hospitals and in substance use dens within the five geographical areas. The sampling procedure included purposive sampling and snow balling.

Those identified were approached for informed consent after consent explanation by a researcher or trained research assistant. Structured questionnaires on social-demographic inferential, types of drugs abused, the time pattern and methods of use were used for face to face interview. Confidentiality was observed and assured.

A subset --120 drug users from Mombasa -- underwent serological testing for HIV and Hepatitis C status. The investigative team comprised of a research coordinator, 5 addiction & HIV/AIDS counselors and two ex-drug abusers who helped in approaching and identification of the drug dens or abusers. The five counselors worked with drug abusers for at least two years in the city. Serological testing was done at Al-Farooq hospital, a reputable Medical Centre located in a central area of Mombasa. The city was divided into well-defined catchment areas, for outreach workers to get in touch with the drug abusers who were approached in their own hang-outs, work places and homes. This was done to inform them about the study, and enlist their participation. Those recruited into the study were provided with fare to the Al-Farooq Hospital.

At Al-Farooq Hospital, prospective participants were received in the waiting room where each was allocated a number (e.g. 1,2,3,4,5 up to 120) by the counselors. The latter explained the concept and purpose of the study again and reminded them that their blood would be sampled for HIV & Hepatitis C individually. Each participant signed a consent form and completed a pre-test counseling session lasting about 30 minutes. The bio-data of the subject was recorded (e.g. Name, Sex, Age, drug and mode of use and area of abode, etc).

The participant then had blood sample collected by a Laboratory technician in presence of counselor to ensure that the number allocated to the client corresponded with the number labeled on the sample bottle. The blood was tested for HIV and Hepatitis C using the standard procedure in place in Kenya in all VCT Centers. For Hepatitis C the BioRapid – HCV

kit was used. This is a rapid binding immunoassay in-vitro diagnostic test procedure, with four high sensitivity recombinant antigens. The results were read visually. Each received their results the next day whereby a post-test counseling session lasting 20-30 minutes was provided. The Data was entered and analyzed using the SPSS version 11.

## Results

The majority (74.3%) in this study were aged 20-29 years in Nigeria (Kehinde, Lawoyin, (2005). In Harare, Zimbabwe and Moshi, Tanzania the HIV prevalence among women attending primary care clinics was found at 29.3% and 11.5% respectively (Mbizvo, et al, 2005).

### Most Frequently Used Drug (%)

Alcohol was the most abused drug in Kenya with a national abuser rate of 36.3% followed by nicotine (17.5%), Cannabis sativa (9.9%), heroin (8.0%), Khat (2.8%) and cocaine (2.2%) (Table 1).

### Ever Used Drugs (%)

With the exception of Malindi, the majority of whom did not respond to this question, over 90.0% of the people had a history of ever using drugs of abuse and the majority were active users on a daily basis (average daily prevalence rate of 46.0%)(table 2).

### Methods of Use (%)

Oral (45.7% on average) and nasal (38.7%) were by far the most common modes of consumption of drugs, followed by intravenous administration (injection) at 10.4% (table 3).

### Method of use over time (%) (Table 4)

These varied by region as can be seen in table 4 though there is a high current consumption through all modes in all towns except Malindi that users don't sniff nor snort, but has a 100% one-day prevalence for injection use.

### HIV and HCV status

Among the 120 tested for HIV (not necessarily AIDS) and HCV, 111 (92.5%) were males and 9 (7.5%) females with 54.2% aged 30 or less. Of the males 94 (84.7%) were IDUs and 17(15.3%) were non-IDUs whereas 7(77.8%) and 2(22.2%) of the females were IDUs and non-IDUs respectively (tables 5, 6).

Of the IDUs 46/94 (48.9%) males and 6/7 females (85.7%) tested positive for HIV (Table 7) with the respective results for a positive Hepatitis C being 66/94 (70.2%) for males and 5/7 (71.4%) for females. Of the total tested 60.8% were positive for Hepatitis C and 41.7% were positive for HIV.

## Discussion

The types of abused drugs found in this study reflect the same pattern observed in schools (Kuria, 1993) with the exception of intravenous use, which is an emerging factor. It is important to note that the 1995 rapid assessment did not report any hard drugs. The 1997 epidemiological school survey (Ndeti, 1997), showed only 0.3% heroin use, 0.3% Mandrax/amphetamines use and 0.3% cocaine and Mandrax use, but there was no intravenous drug use. Alcohol remains the most common and is highly consumed in Nakuru and Kisumu, reflecting the traditional pattern of lifestyle whereby consumption of alcohol was acceptable and even used in several festivities consistent with their location. The majority of the users were young (76.2%), below age 30 years.

In this study cocaine was found in 8.2% of the study cohorts in Nairobi, Mombasa (1.4%), Nakuru (1.2%), Kisumu (0.4%) and none in Malindi. Heroin was highest in Mombasa (22.3%), followed by Malindi (9.8%), Nairobi (6.0%), Nakuru (1.2%) and Kisumu (0.7%) and used intravenously. Most of the cohorts were active and current drug users. This pattern of drug use, especially the IDU, was highest in the Coastal towns of Mombasa and Malindi, mainly among the Swahili is largely a reflection of the fact that these were active cohorts and not those undergoing rehabilitation after detoxification. Some authors have established links between increased heroin abuse, growth of the tourist industry and the rise of Muslim revivalist groups, created partly as a response to the spread of heroin abuse (13). The Mombasa harbor had been used as a significant transit points for cocaine and heroin destined for Europe, America, Southeast and Southwest Asia with 'Spillover effects,' in which drugs destined for other countries are sold to local consumers.

IDU is a new phenomenon compared with previous published school surveys. There is sharing of needles even in people who know that they

are HIV positive. HIV status and IDU use are a significant association in Kenya; as an emerging new trend for spread of HIV.

The subset that was tested for HIV and HCV was relatively younger, with 54.2% aged 30 or less. This age pattern is consistent with findings from other studies. The sex ratio is inconsistent with other findings like the Amsterdam study where an emerging increase female ratio was found. The low turnout of females in the tested subset can be attributed to the following: their low number in general, their fear of being tested as many of them were also commercial sex workers, the way the sample was achieved through snowballing and the fact that little attention had been paid to them as an affected group up to now.

The younger the age group, the higher the HIV and HCV positive results. This has the implication in that the most affected group is the youngest one. The rates were even higher for HCV for the respective age groups. The trend of the results is the same when the age group is compared with the cohort sample. There is higher HIV/HCV co-infection rate among the females than the males for which the authors have no explanation. The figure (49.5%) found in this study was 2.5%, which is 2 to 3 times as high.

Whereas research indicates that IDUs can and do change their needle-sharing and cleaning practices, HIV prevention efforts have not been successful in the realm of sexual behavior, particularly with regard to condom use. IDUs still report low rates of condom use with their partners. IDUs act as a bridging group for HIV transmission to the general population through sexual risk behavior, thus policies and interventions must focus on this aspect of behavior change and, should target, at a minimum, the steady sexual partners of IDUs as well as the IDUs themselves and their injecting risk behavior

### Conclusion

There is an upward trend in injecting drug use among the drug users. These results also confirm a linkage between IDU behavior and HIV. There is a need for further research to determine the effects of co-infection of HIV, HCV and other diseases like STIs or tuberculosis and other opportunistic infections. Distinct regional variations within Kenya will require interventions that are context-specific.

However, maximizing the goodness of contextual or cultural fit is a major line of research investigation in HIV/AIDS prevention (Deviex et al., 2004) and must be linked with the urgency of syndemic patterns (co-occurring epidemics) in African countries. Castro and Farmer (2005) have underscored that intervention design depends on integrating context with what works—that populations respond and change their behavior accordingly, to health care infrastructures and interventions that work. The U.N. Commission on HIV/AIDS and Governance in Africa [<http://www.uneca.org/chga/about.htm>] is an acknowledgement of the relationship between HIV prevention, health care infrastructure and institutions of law and governance. A recent study by Menon-Johansson (2005) found higher HIV prevalence among countries with poor governance, confirming the Nobel Laureate Amartya Sen's work linking public health with democratic institutions.

Countries like Kenya have the advantage of beginning with this knowledge that individual, behavioral-only interventions—even when evidence-based and effective—are not enough by themselves. They require ecological structures of support, as the U.S. has begun to realize in the last five years in its funded research initiatives through the National Institutes of Health. IDU-focused prevention in Kenya must combine knowledge about effective behavioral interventions with what is now known about cultural adaptation, and do so in such a way that adds to and links the prevention infrastructure with the country's efforts at building democratic institutions and economic freedom, particularly for women.

Table 1  
Most Frequently Used Drugs by Region (%)

	Mombasa n=350	Malindi n=183	Nairobi n=364	Nakuru n=246	Kisumu n=277
Alcohol	29.4	6.6	36.8	54.1	54.5
Nicotine	21.4	21.9	16.5	16.7	10.8

Cannabis Sativa	10.6	3.3	12.1	15.0	7.9
Catha Edulis	5.4	0.0	4.9	3.3	0.4
Cocaine	1.4	0.0	8.2	1.2	0.4
Heroin	22.3	9.8	6.0	1.2	0.7
Sedatives	0.6		1.6	0.4	0.7
Pethidine	0.0		0.5	2.0	0.4
Kuber	0.0		0.0		0.4
Morphine	0.0		5.5		0.4
Inhalants (Glue)	0.0		0.3		1.4
Phencyclidine	0.6		0.5		
Pills / Piriton	0.0		0.5		
Amphetamines	0.0		1.6		

Table 2  
Ever Used Drugs (%)

	Mombasa n=350	Malindi n=183	Nairobi n=364	Nakuru n=246	Kisumu n=277
Ever used drugs	92.0	49.2	95.3	93.1	76.2
Today	68.9	37.7	53.6	37.4	31.0
Past 30 days	10.0	2.2	21.2	25.2	19.5
More than 30 days	0.9	0.5	8.8	6.9	5.1
Less than 12 months	5.1	1.1	4.9	8.5	7.6
More than 12 months	7.7	4.9	8.5	14.0	14.1
Not specified	7.4	53.6	3.0	7.3	22.7

Table 3  
Methods of Use (%)

	Mombasa n=314	Malindi n=75	Nairobi n=340	Nakuru N=222	Kisumu n=209
Swallow	33.4	16.0	47.4	59.5	72.2
Smoke	43.9	62.7	30.6	32.4	23.9
Snort/Sniff	5.7	0.0	5.0	5.0	1.4
Inject	12.1	21.3	15.9	0.9	1.9

Table 4  
Method of Use Over Time (%)

SWALLOW	Mombasa	Malindi	Nairobi	Nakuru	Kisumu
Today	56.6	83.3	47.0	30.8	41.1
Past week	17.9	0.0	26.2	28.6	23.5
Past 30 days	0.9	0.0	9.1	9.8	5.9
More than 30 days	2.8	0.0	6.1	12.8	11.8
More than 12 months	12.3	16.7	11.6	18.0	17.6

SMOKE	Mombasa	Malindi	Nairobi	Nakuru	kisumu
Today	86.1	85.1	56.7	54.9	40.0
Past week	5.8	4.3	17.3	25.4	24.0
Past 30 days	0.7	0.0	10.6	2.8	8.0
More than 30 days	0.7	4.3	6.7	2.8	6.0
More than 12 months	6.6	6.4	8.7	14.1	22.0

SNORT/ SNIFF	Mombasa	Malindi	Nairobi	Nakuru	Kisumu
Today	85.0	0.0	70.6	72.7	33.3
Past weeks	5.0	0.0	11.8	9.1	66.7
Past 30 days	5.0	0.0	5.9	9.1	0.0
More than 30 days	0.0	0.0	5.9	9.1	0.0
More than 12 months	5.0	0.0	5.9	0.0	0.0

INJECTION	Mombasa	Malindi	Nairobi	Nakuru	Kisumu
Today	86.5	100.0	67.9	0.0	25.0
Past week	27.0	0.0	23.2	50.0	25.0
Past 30 days	0.0	0.0	8.9	0.0	25.0
More than 30 days	5.4	0.0	0.0	0.0	0.0
More than 12 months	5.4	0.0	0.0	50.0	25.0

Table 5  
Gender Vs Status

HCV Status	Gender	
	Male	Female
Positive	66 (65.3)	5 (5.0)
Negative	28 (27.7)	2 (2.0)
X= 0.92.11 df= 1		
HIV Status		
Positive	46? (45.5)	4? (3.9)
Negative	48 (47.5)	3 (3.0)
Total	94 (93.1)	7 (6.9)

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## International Perspectives on Governmental Aggression

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Researchers interested in international perspectives on a range of social issues have fertile grounds for pilot testing of procedures and obtaining preliminary data right within the rich, multi-cultural United States. As pointed out by Rice (2005), the foreign-born population, which currently composes 11.1% of the nation's population, increased by 57% from 19.8 million in 1990 to 31.1 million in 2000; the native born population increased by only 9.3% during the same decade. According to recent figures, more than 50 percent of these immigrants were born in Latin America, over 25 percent were born in Asia, 14 percent were born