

Drugs and Substance Abuse Amongst Adolescents - A pilot Study in 7 Districts

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ABSTRACT

Introduction: Studies have shown that alcohol and illicit drug abuse are a growing problem in Africa and Rwanda in particular. This study aimed at determining the prevalence of alcohol and drug use by adolescents and young adults in 7 districts in Rwanda.

Methods: This was a cross-sectional study with mixed methods using individual interviews with questions on alcohol and substance abuse, and substance use disorders. We used Mini International Neuropsychiatric Interview (MINI) and other mostly standardized questionnaires to collect data and urine specimens to cross-validate responses.

Results: 3301 adolescents and young adults aged 13 to 24 from 7 selected districts participated in this cross-sectional study. In the past 30 days, 28.5% of adolescents reported to have used alcohol; 4.4% reported to have used cannabis, while the reported prevalence for cigarettes, opiates and cocaine was respectively 2.9%; 0.2%; 0.1%. Urine analysis testing for presence of cannabis and heroin confirmed the reported findings, showing high sensitivity (80%) and specificity (99%). No participant reported the use of amphetamines or methamphetamines. Youth currently using cannabis were more likely to report unprotected sexual practice in the past 12 months (OR=3.4, $p<0.001$) compared to those who did not use cannabis. Alcohol and cannabis were the main factors for youths to have a protected sex at (OR=3.4, $p<0.001$) and (OR=3.3, $p<0.001$).

Conclusions: Alcohol and cannabis are the most used substances among adolescents, and alcohol and drug use are associated with unprotected sexual practice.

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Received: January 23, 2023

Accepted: February 7, 2023

Published: March 31, 2023

Cite this article as: Gishoma et al. Prevalence of Drugs and Substance Abuse Amongst Adolescents - A pilot Study in 7 Districts. *Rw. Public Health Bul.* 2023. 4 (1): 7-31.

INTRODUCTION

More than 33 percent of the disease burden and almost 60 percent of premature deaths among adults can be associated with behaviors or conditions that

began or occurred during adolescence, including tobacco, alcohol use, poor eating habits, sexual abuse, and risky sex [1].

The use of alcohol, tobacco, cannabis and other psychoactive substances constitutes one of the

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. © **Copyright:** The Author(s). This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY-NC-ND), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** <https://rbc.gov.rw/publichealthbulletin/>

most important public health problems among youth worldwide [2]. Recent studies in African countries have shown that the phenomenon of drug use is also common in this continent and is becoming one of the most disturbing health-related problems among youth [3,4]. Studies show that there is an increasing incidence in the use, and a decreasing age of onset, of these substances. Most young people begin their use of drugs with alcohol and cigarettes and later progress to more dangerous substances such as cannabis and cocaine [5]. A study conducted in 2011 and published in 2015 by Kanyoni et al. [6] on Rwandan youth aged < 35 years revealed that the past-30-day prevalence among youth was 34.0% for alcohol, 8.5% for tobacco smoking, 2.7% for cannabis, 0.2% for glue and 0.1% for drugs such as diazepam. The mean age of onset of drug (alcohol, cannabis, cigarettes, glue and drugs such as diazepam) abuse was 11.4 years. Dependence and misuse on alcohol was found to be significantly associated with male gender, age, being orphan or having one parent alive, and dropping out of school.

Available evidence from two studies in Rwanda indicates that substance use among youth is a phenomenon that exists in Rwanda. Additional data from police reports, rehabilitation centers and hospital records tend to confirm that there are reasons to believe that substance use is prevalent in Rwanda [6,7]. Rwanda National Police crimes figures in 2017 indicates that the number of people arrested for involvement in illicit drug trafficking and abuse was 3941 representing 18.0% of all 21894 crimes recorded in that year [8]. At Ndera Neuropsychiatric Hospital, the main psychiatric institution in Rwanda, the number of patients admitted with mental disorders due to psychoactive substances use increased from 68 patients annually in 2004 to 2804 patients in 2016 [9]. Iwawa Rehabilitation Center was created to provide rehabilitation service, vocational training for youth abusing drugs and support them in reintegrating into the community: since 2010, 12 293 youth have graduated from Iwawa Rehabilitation Center [10].

Substance abuse incurs high psychosocial and economic costs for the young people who experience it, for their families, and for the society in which they live, study, and will work [11]. In this regard, the Ministry in charge of youth to which Iwawa Rehabilitation Center is affiliated estimates the cost for the government for one youth

under rehabilitation at the center to be 591,348 Rwandan francs equivalent to 675.83 USD [10]. The Government of Rwanda is very conscious and aware of the extent and consequences of the drug use and the Prime Minister's order N°113/03 of 19/06/2015 established an interministerial committee responsible to coordinate all efforts in drug use prevention and rehabilitation services. Despite substantive efforts made to fight against drug abuse in Rwanda, gaps remain in the domain of prevention, treatment and rehabilitation services to improve long term outcomes among youth in Rwanda.

In order to have recent and complete information on drug and substance abuse among young people in Rwanda, a pilot assessment was planned by BARAME Project to serve as baseline data in the 7 districts on interventions (Gakenke, Gisagara, Karongi, Nyamasheke, Nyarugenge, Rulindo, and Rusizi). Collected data on prevalence of drug and substance abuse by young people in the mentioned districts will be a benchmark against which progress of indicators shall be assessed during the course of the project implementation. The overall objective of this assessment was to determine the prevalence of drug and substance abuse among and young people (13-24 years) in the 7 districts of BARAME Project. The BARAME Project is a health sector intervention financed by Enabel (Belgian Development Agency) through a bilateral cooperation agreement between the Federal Government of Belgium and the Government of Rwanda

METHODS

Study design: This survey used a cross-sectional analytical design with both quantitative and qualitative approaches. Multistage sampling was used to select participants. The primary sampling units (PSUs) were seven districts supported by BARAME Project and the sample was selected in the following 3 stages.

First stage: The Primary Survey Units (villages /imidugudu) were selected randomly from the villages where project operates its activities. Villages were randomly selected using Excel.

Second stage: Households were systematically selected, and the first sample unit was identified by the random starting point. The second sample unit was matched to the random starting point.

Third stage: At the household level, one household

member aged between 13 and 24 years old was randomly selected and invited to respond to the questionnaire.

The sample size is calculated by using the formula:

$$N = Z^2 \times P(1-P) / e^2$$

Where N= sample size, Z= level of confidence, P= baseline level of the selected indicator and e= margin of error. Given the estimated prevalence risk factors, P=0.50 (recommended when prevalence is unknown), Z= 1.96 (at 95% Confidence Interval), the estimated sample size is 400

Adjusting for: Number of domains = 7 (multiply), the estimated required sample size is therefore $N = 400 \times 7 = 2800$ and assuming a non-response rate of 20%, the final sample size was therefore adjusted upward to: $N = 2800 + 2800 \times 20\% = 3360$.

Due to the non-proportional allocation of the sample to the districts and the possible differences in response rates, sampling weights were required for any analysis using data from this survey to ensure the actual representativeness of the survey results at District level. The weighting process was applied to 463 villages from seven districts. The target population for qualitative survey was the local leaders and stakeholders in the seven Districts (Nyarugenge, Rulindo, Gakenke, Karongi, Nyamasheke, Rusizi and Gisagara). The sample comprised the Vice Mayor in Charge Social Affairs and District Executive Administrator (DEA) in Nyarugenge District only, Director of Health, National Youth Council (NYC) or Youth, Culture and Sport Officer (YCSO), Rwanda Investigation Bureau (RIB) and Rwanda National Police (RNP). Moreover, at the District Hospital level, the study targeted the clinical psychologists, the head of mental health professionals, community health supervisors, and the technicians at Isange One Stop Centers (IOSCs): Rwanda Investigation Bureau (RIB) or Gender-Based Violence Officer. In each District, only one District hospital was selected

Data collection instruments and measures: This study used questionnaires to assess and measure alcohol and substance use. Substance use was measured with a standard set of three questions used to determine the “usability” of a substance on 3 standard time intervals (lifetime, 12 months and past 30 days) and generate the lifetime, annual and monthly (or “current”) prevalence rates: *Have you ever used X substance in your lifetime? Have you*

used the substance X during the last 12 months, and have you used the substance X during the past 30 days?

These standardized questions constitute key indicators that are used in the majority of international surveys [12–15].

To assess binge drinking and harmful use of substances, we added questions related to the frequency (eg. how many times he/ she used the drug during that period) or the quantity (eg. how many drinks in a row). The research team also explored alcohol binge drinking and cannabis frequent use as modalities of misuse pattern among adolescents. The binge drinking is assessed with the following question: *During the past 30 days, on how many days did you have 3 or more drinks of alcohol in a row, that is, within a 3-hour period?* For this study, youth that indicated consumption of alcohol in the last month, were asked to report the number of drinks that they had had in a session.

The cannabis misuse was assessed with the following question: *How many times have you used cannabis in the preceding 12 months? 30 days? Misuse: >5 in the past month.*

The unit used for cannabis on the Rwandan market is called “boule”. We added a question: *How many “boules” of cannabis you generally use per day?* Modalities of use and behaviours related to the use of heroin, cocaine, and other illicit substances abuse were simply explored using 11 criteria to assess substance use disorders (SUDs) [16]. The main instrument used to explore substance use disorders and comorbid conditions was the Mini International Neuropsychiatric Interview (MINI-5).

Heavy alcohol use can lead to negative consequences, including Alcohol Use Disorder (AUD). AUD is a problematic pattern of use accompanied by clinically significant impairment or distress. DSM-5 AUD diagnosis required at least 2 of the following 11 criteria: (1) more use than intended of larger amounts of alcohol; (2) unsuccessful efforts to cut down alcohol use; (3) important activities given up because of use; (4) craving or intense desire of alcohol; failure to fulfil major role obligations at work, school, or home; (6) persistent social or interpersonal problems caused by alcohol; (7) excessive time spent in acquisition of alcohol; (8) use of alcohol in hazardous situation; (9) continued drinking despite problems caused; (10) tolerance; (11) withdrawal symptoms.

While illicit drug use is deemed an important contributor to the global burden of disease, it is well documented that alcohol and tobacco misuse among young adult can also be detrimental to health [17]. Furthermore, despite the fact that alcohol and tobacco are considered as licit substances for adults in Rwanda, it is still illegal to sell alcohol and tobacco to Under 18 in Rwanda (Organic Law implementing the Penal Code N°01/2012/OL Articles 217 and 219). For these reasons, alcohol and tobacco were added among substances to the report.

Qualitative instruments: Interviews were conducted based on a semi-structured interview guide with open-ended questions. The questions discussed during the interviews aimed at exploring participants' perceptions and understanding of three main topics. The first topic covered the perception of prevalence of drug and substance abuse among adolescents and young adults in each District. The second topic explored the main types of drugs and substances consumed by adolescents and young adults. The third topic examined socio-demographic determinants of drug and substance abuse among young people in each of the districts (e.g: sex, residence, education level, age group, marital status, family socio-economic status etc.). The final goal of this survey was to make recommendations rooted in the surveys' findings, on ways to decrease drug and substance abuse in the aforementioned seven Districts.

Lab test: In order to examine the degree of agreement between reported illicit drug use and biological data, a sub sample of adolescents was selected and requested to provide urine specimens using a systematic sampling approach. Using the list of households sampled, the participant selected in the 10th household (regular interval) was requested to voluntarily submit a urine sample. Prior to their consent for study participation, the selected research participants were informed about the interviewer administered questionnaire and the eventual request for a urine sample. When in the consent procedure, the selected youth did not want to provide a urine sample; he/she was replaced by the next on the list for providing a urine sample. Participants were given 2 labeled sterile containers before entering in the collection area (bathroom). Urine specimens collected were tested qualitatively to detect metabolite presence in urines. An onsite

rapid test was conducted for Tetrahydrocannabinol (THC), opiates, Cocaine, Amphetamines and Metamphetamines using HumaDrug test designed for qualitative detection of drugs in human urine for the time between 1–4-week periods [18].

Data collection: The data collection started on 2nd November 2020 and ended the 24th November 2020. The Computer-Assisted Personal Interviewing (CAPI) technique was used to collect data. This system has proved to be more reliable and efficient than the usual Paper and Pencil (PAP) techniques. It also allows for better real-time monitoring of the data collection exercise. The approved questionnaire was uploaded into the tablets using Open Data Kit software (ODK). The latter helps to collect field data on a mobile device and upload it to a server from where they are extracted for analysis. In addition, the GPS incorporated in ODK helps to regularly monitor geographical location and progress of the interviews.

Each enumerator completed five (5) questionnaires per day. Interviews were conducted in a safe and confidential place. The supervisor was responsible for deploying enumerators in the respective villages, validating the collected data before sending them to the server as well as conducting interviews him/herself. Data collection was conducted by 23 enumerators and 7 supervisors in twenty (20) working days. Supervisors conducted regular checks using spot check form for completeness of enumerators while they were still at the respondents' house. At the end of each day, all collected data were sent to the server. The data manager provided regular progress updates to the principal investigator and technical committee during data collection. For key informants' interviews, we have used open end questions and scripts were taken for 3 persons.

Statistical analysis: Data cleaning was processed using STATA 16; and the advanced data analysis was conducted using SPSS V25 software. Descriptive analyses were conducted to generate the prevalence of alcohol and substance use among youth. Bivariate and multivariate analyses were performed for potential determinants using binary regression model to estimate the odds of having engaged in substance use behaviour. The following social demographic characteristics were considered as the potential determinants during the

analysis: education, income distribution, marital status, occupation, age, sex, family size and setting (rural/urban). The factors associated with alcohol and drug abuse were examined by using measurement of associations (i.e., Odds Ratios). The confidence level to confirm the significance of the results was CI 95%.

After the completion of the qualitative survey, themes were identified, subjects interviewed, and representative quotes were grouped. Themes were classified based on topics intended to be explored and topics were explored by analyzing the content of interview quotes. The study team identified different themes that informed on the living experiences of participants and their communities regarding drug and substance abuse.

Ethical considerations: The study received ethical approval by the Rwanda National Ethics Committee (RNEC): No. 940/ RNEC/2020, and participants were asked to sign a consent form before participation in study. Only willing and available respondents were interviewed. For subjects less than 18-years-old to participate, consent from parents of guardians was required and the minors were later asked to assent.

The confidentiality of the participant was particularly guaranteed. The research team ensured that all respondents' participation was conducted at a safe and secure place. Moreover, to ensure privacy, all interviews were conducted in a convenient place where other people were not able to listen or follow the proceedings.

During interviews, if there were indications that the participant is experiencing emotional distress (eg. uncontrolled crying) or exhibit other behaviours suggesting that the interview is too stressful, enumerators followed a stepped protocol: a) offer support and allow the participant to recover and continue b) stop the interview, c) refer to a healthcare provider or mental healthcare provider.

RESULTS

Social demographic description of respondents

The Table 1 describes socio-demographic information of respondents. It summarizes the number of respondents per district, residence area, gender, age group, level of education and marital status. We interviewed 3301 persons in total, and the non-response rate is low in this study (1.8%), Interestingly, non-response was more predominant

in female than in male participants. The most common reason for non-response was an inability to respond due to household work.

The sample included participants residing in villages characterized by the Rwanda National Institute of Statistics (2015) as rural, urban and peri urban. 394 (11.9%) of all respondents lived in urban areas, 1058 (32.1%) lived in peri urban areas, while 1849 (56.0%) lived in rural areas. The peri urban areas correspond to areas where urban and rural characteristics are mixed and located on the periphery of urban areas. Regarding sex, 2023 (61.3%) were male and 1278 (38.7%) were female. The proportion of male participants was larger than the proportion of female because selected female participants were not found in the household at the time of the study (they went out for work or other places such as markets).

Table 2 describes socio-demographic information of the household. It shows that most household heads (73.2%) had no school education or had only attained primary school as their highest level of education. More than half of the selected households fall in the Ubudehe socioeconomic Category 1 (18.1% - Very poor, vulnerable citizens unable to feed themselves without assistance) or Category 2 (39.5% - Can afford to eat once or twice a day and afford some form of rented or low class owned accommodation); while 40.6 % are part of category 3 (Citizens who are employed, farmers who have moved beyond subsistence farming or owners of small and medium scale enterprises).

Lifetime, annual and 30-day alcohol prevalence

Most youth encountered from the 7 districts (56.1%) had tried alcohol at least once in their lifetime and 43.9 % were still primarily abstinent. The lifetime use is an indicator of experimentation which does not necessary lead to harm or specific risk of alcohol misuse. Among all 1851 participants (56.1%) who had taken alcohol at least once in their lifetime, a considerable proportion of them (1336 participants) representing 72.2% of lifetime users reported to have used alcohol at least once in the last 12 months. On assessment for use in the last 30 days, 1044 participants reported the use of alcohol. They represent 78.1% of the past 12 month's users and 56.4% of lifetime users. The findings suggest that once use began, the likelihood of continuing from initiation (lifetime prevalence) to continuing use (current use) is relatively high;

Table 1: Socio-demographic description of respondents

	District	Count	%
District	Gakenke	594	18.0
	Gisagara	383	11.6
	Karongi	598	18.1
	Nyamasheke	385	11.7
	Nyarugenge	311	9.4
	Rulindo	484	14.7
	Rusizi	546	16.5
Location	Urban	394	11.9
	Peri Urban	1058	32.1
	Rural	1849	56.0
Gender	Male	2023	61.3
	Female	1278	38.7
Age group	[13-18]	1557	47.2
	[19-24]	1744	52.8
Education	None	479	14.5
	Primary	2099	63.6
	Secondary	707	21.4
	University	16	0.5
Marital status	Single	3172	96.1
	Married	122	3.7
	Widow/er	1	0.0
	Divorced	6	0.2

although it is important to note many current users can be defined as “moderate users”. Table 3 includes information on the lifetime, annual and monthly prevalence for alcohol.

Binge drinking

Overall, 13.7 % of male and 2.7% of female had at least one binge drinking alcohol consumption episode over the past 30 days. When looking at the proportions of binge drinkers, it appears that adolescent (males and females) aged 17 and below (1.0%) and girls aged 18 and above (1.8%) are less concerned by binge drinking whereas boys aged 18 and above represent the majority of binge drinkers (9.2%) (Table 4).

Alcohol use disorder (AUD) and Tobacco uses among adolescents

The prevalence of AUD that was found to be 3.6% (118) in our sample. Levels of tobacco use among

adolescent were relatively low (97, 2.9%) in the 7 districts. However, some adolescents were regular smokers and 22/112 (19.64% among smokers) had been smoking 1 to 2 packs in the last 30 days (Table 5).

Prevalence of illicit drugs among adolescents

The Table 6 shows the prevalence of drug use in lifetime, past and current period among all 3301 respondents. Cannabis is the most used illegal substance by adolescents in the 7 districts with 306 adolescents (9.3%) reporting to have used cannabis at least once in their lifetime; 227 (6.9%) adolescents consumed cannabis in the past 12 months while 175 (5.3%) used cannabis in the last 30 days preceding the interview.

Illicit drugs such as cocaine and heroin are used in some places, but the overall prevalence of reported ever-used opiates and cocaine remains low; heroin used by 17 (0.5%) respondents and cocaine used

Table 2: Socio-demographic description of household (N=3301)

		Count	%
Highest level of education of household head	None	963	29.1
	Primary	1455	44.1
	Secondary	248	7.5
	University	52	1.5
	Don't know	584	17.7
Occupation of household head	Salary	391	11.8
	Self-employed	1831	55.6
	No paid job	602	18.2
	Living with disability	125	3.8
	Retired	23	0.7
Ubudehe* category of household	No job	323	9.8
	Category I	596	18.1
	Category II	1304	39.5
	Category III	1341	40.9
	Category IV	4	0.1
Member of household	Don't know	56	1.7
	1	88	2.7
	2	221	6.7
	[3-4]	753	22.8
	[5-6]	1084	32.8
	[7-8]	822	24.9
Eligible youth within household	[9+]	333	10.1
	one	931	28.2
	two	1019	30.9
	Three	778	23.6
Male within household	Four or more	573	17.4
	None	126	3.8
	One	586	17.8
	Two	932	28.2
	Three	773	23.4
Female with household	Four or more	884	28.8
	None	160	4.8
	One	476	14.4
	Two	786	23.8
	Three	767	23.2
	Four or more	1112	33.7

*Ubudehe category: Ubudehe is a social stratification programme depending on income among households

by 3 (0.1%) respondents.

Regular cannabis use is defined as those who had been using cannabis 5 times or more in the last 30

days. Of those who used cannabis during the past 30 days (227), a strong majority 176 (77.5 %) used cannabis more than 5 times in the last 30 days

Table 3: Prevalence of alcohol use

		Lifetime		Past*		Current	
		Count	%	Count	%	Count	%
Authorized drinks	Alcoholic beverages	1787	54.1	1264	38.3	960	29.1
Unauthorized drinks	Kanyanga	248	7.5	118	3.6	49	1.5
	Chief Warage	64	1.9	37	1.1	25	0.8
	Igikwangari	101	3.1	98	3.0	90	2.7
	King Warage	26	0.8	49	1.5	26	0.8
	Other	101	3.1	113	3.4	73	2.2
Overall alcohol use (people consuming at least one)		1851	56.1%	1336	40.5%	1044	31.6

Authorized drinks: Legal drinks; Unauthorized drinks: Illegal drinks; *Past 12 months

Substance use disorder associated with illicit drugs

According to the screening interview, 1.2% of the youth in the 7 districts considered, met the diagnosis criteria for non-alcohol psychoactive SUD (Table 7).

The rates of alcohol and substance use in the table below represent the estimated proportion of adolescent and youth who had used the substance at least once in the last month. The weighted 30-day prevalence for alcohol, cannabis, cigarettes,

opiates and cocaine was respectively 28.5%; 4.4%; 2.9%; 0.2%; 0.1% (Table 8). The rates of alcohol and substance use in the table below represent the estimated proportion of adolescent and youth who had used the substance at least once in the last month. The weighted 30-day prevalence for alcohol, cannabis, cigarettes, opiates and cocaine was respectively 28.5%; 4.4%; 2.9%; 0.2%; 0.1% (Table 9). The mean age at onset of alcohol, cannabis, and heroin use was 13.1, 16.8 and 18.5 respectively (Figure 1).

Table 4: Distribution of binge drinking by gender

		Male (n=2,023)		Female (n=1278)	
		Count	%	Count	%
Binge Drinking	No	557	27.5%	163	12.8%
	Yes	278	13.7%	34	2.7%
	Non user (abstinent)	1188	58.7%	1081	84.6%
Binge Drinking (# drinks or more in 3 h)	5 drinks for boys aged 18 and above	186	9.2%	-	-
	4 drinks for girls aged 18 and above	-	-	23	1.8%
	3 drinks for youth aged 17 and below	20	1.0%	3	0.2%
	non binge drinking	72	3.6%	8	0.6%
	Non user (abstinent)	1745	86.3%	1244	97.3%
Frequency	0 days	3	0.1%	1	0.1%
	1 or 2 days	102	5.0%	14	1.1%
	3 to 5 days	90	4.4%	6	0.5%
	6 to 9 days	30	1.5%	4	0.3%
	10 to 19 days	35	1.7%	6	0.5%
	20 to 29 days	11	0.5%	2	0.2%
	All 30 days	7	0.3%	1	0.1%
	Not user	1745	86.3%	1244	97.3%

Table 5: Frequency use of tobacco in 30 days

Use of tobacco in 30 days		
	Count	%
Not user	3204	97.1
One to five cigarettes per day	44	1.3
Two packs or more per month	16	0.5
About one-half pack	7	0.2
One- and one -half packs per month	6	0.2
One pack	5	0.2
Total	3301	100.0

Determinants of alcohol misuse

Binge drinking varies across districts and the proportion of adolescent having binge drinkers are higher in Nyarugenge, Nyamasheke and Gisagara than in other districts (Table 10).

Binge-drinking pattern also increased significantly in youth aged 18 and above. Binge drinking was ascertained using the following criteria: 3 drinks in a row (within a 3-hour period) for youth (boys and girls) aged 17 and below; 4 drinks in a row (within a 3-hour period) for girls aged 18 and above; and 5 drinks in a row (within a 3-hour period) for youth aged 18 and above.

Multivariate logistic regression analysis showed that youth with age above 18 years old, youth who lost parents or relatives, youth with family history of alcohol or drug problem, youth suspended from school, youth who reported history of unintended pregnancy were more likely to report higher rates of binge drinking (Table 11).

Determinants for illicit drugs

The rates of cocaine and heroin use in this study were too small to conduct meaningful statistical analyses. We therefore combined cannabis, heroin,

and cocaine use under the new variable “illicit drugs. Adolescent cannabis-use prevalence rates in Nyarugenge (19.0%) are 3 times higher than the average of other districts (5.3%). Cannabis-use prevalence rates are also elevated in Gisagara (8.1 %) compared to the average of other districts. The lowest average prevalence rates for cannabis use are found in Rusizi (2.2%) and Rulindo (3.1%) (Figure 2).

Adolescents suspended from schools were 4.8 times more likely to use drugs than those who attended school. Other factors such as male gender, older age, living in urban areas, history of family conflict, inability to afford food, suspension from school, availability of drug in the community, family history of alcohol or drug problem were also found to be associated with illicit drug use (Table 12).

Co-occurrence of substance use disorders and other mental illnesses

Logistic regression analysis showed that there was an association between hard drug use and mental illness (i.e., depression, suicidality and anxiety) (95%CI: 1.750-12.20, p=0.002).

Table 6: Prevalence of illicit drug use (n=3301)

	Lifetime		Past*		Current	
	Count	%	Count	%	Count	%
Cannabis	306	9.3	227	6.9	175	5.3
Opiates	17	0.5	13	0.4	7	0.2
Cocaine	3	0.1	3	0.1	3	0.1
Catha Edulis	12	0.4	8	0.2	4	0.1
Datura Stramonium	22	0.7	6	0.2	5	0.2
Shisha	28	0.9	8	0.2	2	0.1

*Past 12 months

Table 7: Frequency use of cannabis in 30 days

Use of cannabis	Frequency	%
<=5	51	1.5
[6-10]	28	0.8
11+	148	4.5
Not user	3074	93.1
Total	3301	100.0

Binary regression results supported this hypothesis: adolescent and youth with major depressive past episode had 1.7 greater odds of using alcohol than those not depressed (95% CI: 1.066-2.066, p=0.025) and those with generalized anxiety disorder had almost 2 times greater odds of using alcohol than those who did not report anxiety symptoms (95%CI: 1.511-2.626, p=0.000) (Table 13).

Results show that having sexual intercourse in the past 12 months was significantly associated with alcohol (OR=3.5, p<0.001) and cannabis

use (OR=2.4, p<0.001). Engaging in unprotected sex was also significantly associated with alcohol (OR=3.0, p<0.001) and cannabis use (OR=2.1, p<0.01). Increased odds of being touched in a sexual way without consent was associated with alcohol use (OR=2.1, p<0.01) (Table 14).

Agreement between rapid tests and confirmatory concentration tests

Largely, quantitative tests confirmed rapid test results: of the 21/376 urine samples tested positive for cannabis with rapid tests, 19/21 remained positive using mass spectrometric immunoassay.

Table 8: S substance use disorder

Substance use disorder (other drugs)	Count	%
No	3261	98.8
Yes	40	1.2
Total	3301	100.0

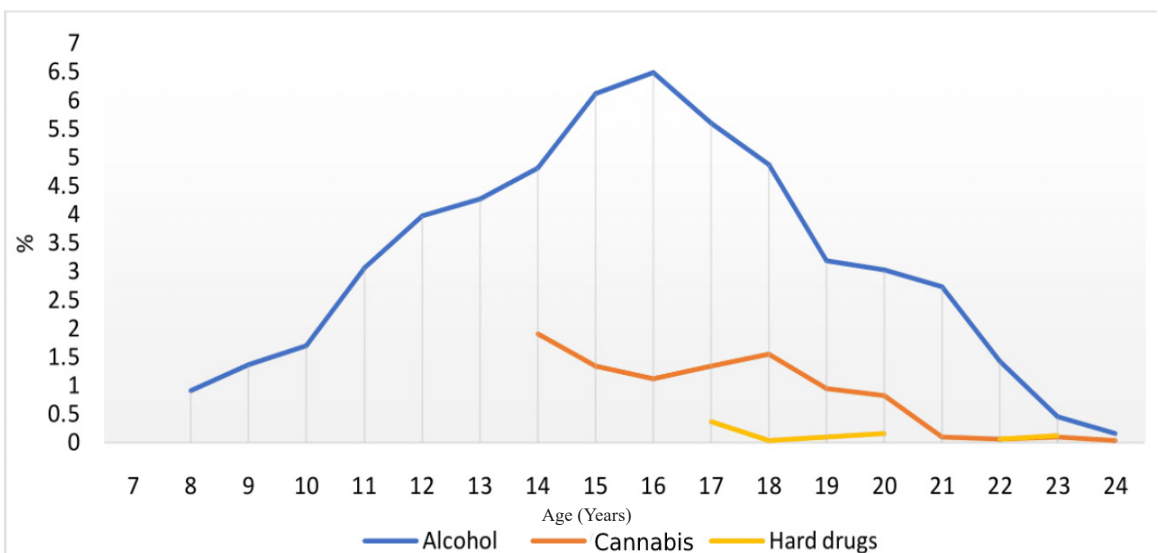


Figure 1: Age of onset of alcohol use and substance use

Table 9: Prevalence by gender

		Male		Female		Overall	
		U (%)	W (%)	U (%)	W (%)	U (%)	W (%)
<i>Past month</i>	User	25.5	20.6	6.1	8.0	31.6	28.5
<i>Alcohol use</i>	Not user	35.7	28.8	32.6	42.6	68.4	71.5
<i>Past month</i>	User	5.1	4.1	0.2	0.2	5.3	4.4
<i>Cannabis use</i>	Not user	56.2	45.3	38.5	50.4	94.7	95.6
<i>Other illicit</i>	User	0.7	0.6	0.3	0.4	1.0	0.9
<i>substance use</i>	Not user	60.6	48.8	38.5	50.2	99.0	99.1

U: Unweighted, W: Weighted

The confirmed positive samples for THC had a concentration varying from 57 ng/ml (minimum) to 300 ng/ml (maximum). For opiates, 2 samples of participants tested positive with rapid tests remained positive with mass spectrometric immunoassay and the concentration was respectively 371 ng/ml and 383 ng/ml.

We cannot determine if the 2-cannabis positive results with rapid test not confirmed with concentration tests were due to the sample degradation during the shipment or the low performance of the rapid test. Regardless of the explanation, it is recommended to consider results from the confirmatory mass spectrometric immunoassay which has a higher performance. The positivity rate for both qualitative and quantitative tests is however nearly equivalent and this suggests that testing with either test produces more or less similar results.

Key Informants' perspectives about alcohol and drug abuse in 7 districts

The findings of this study were based on an in – depth qualitative analysis of the content of all the interviews. The study team adopted a thematic analytical approach to identify the main themes that emerged from participants' perceptions and understanding of the topics under study. The analysis was guided by the main study questions which were (1) the issue of drug and substance

abuse among adolescents and young people in each of the districts; (2) the main type of drugs and substances used by adolescents and young people; (3) socio-demographic determinants of drugs and substance abuse among young people in each of the districts.

Understanding the Prevalence of drug and substance abuse

In general, the study established that the main cause of drug and substance use in the seven Districts is the disintegration of families of majority post genocide youth, especially where parents and adults mistrust the youth. Parents' history and wounds are also indirectly impacting the behavior of majority of the Rwandan youth.

The study established that in Nyarugenge District the problem of drug and substance abuse is mainly instigated by youth bulge and influx of a lot of idle young people from rural areas. Idleness puts them at risk of drug and substance abuse. Another factor is the availability and access to drugs and other substances at the different locations like Gitega, Tarinyota, Bilyogo, Muhima and Nyabugogo Centers. Additional factors that led to drug and substance abuse included family issues such as gender-based violence (GBV) and mental health problems.

The director of Muhima Hospital testified that

Table 10: Abuse of alcohol by districts

	Nyarugenge (n=311)	Rulindo (n=484)	Gakenke (n=594)	Gisagara (n=383)	Karongi (n=598)	Nyamasheke (n=385)	Rusizi (n=546)
Binge Drinking in the last 30 days							
Less than the cutoff	7.4%	37.2%	16.2%	27.7%	25.1%	15.8%	19.0%
Above the cutoff	22.8%	4.5%	4.7%	10.7%	10.2%	11.4%	8.2%
Non user	69.8%	58.3%	79.1%	61.6%	64.7%	72.7%	72.7%

many severe cases of young people's compromised psycho-social and mental health were attributed to drug and substance abuse.

The particularity of Karongi, Rusizi and Nyamasheke Districts was attributed to the close proximity to DRC, the neighboring where controlling human traffic is a big challenge. It was noted that young people are frequently arrested crossing borders for trade in drugs by the

authorities. The study established that Gisagara District had the highest number of prisoners detained on charges of drug and substance abuse. Use of Cannabis was most commonly realized compared to other types of drugs. Those who were arrested were transferred to Rehabilitation Centers for a certain period.

The respondents noted that Gender Based Violence

Table 11: Determinants of current binge drinking

	B	S.E.	OR	CI
Gender of respondent (Female) (base = Male)	-2.105***	0.248	0.122	[0.075-0.198]
Aged above 18 years old (base = below 19)	1.114***	0.189	3.046	[2.104-4.41]
History of unintended pregnancy (base= present)	1.181***	0.211	31.434	[2.155-4.919]
Death of a caregiver or relatives(base=present)	0.373**	0.155	1.452	[1.071-1.969]
Parental Involvement (base= present)	-0.721***	0.167	0.486	[0.350-0.675]
Unable to afford food	0.365**	0.167	1.440	[1.039-1.996]
Family history of alcohol or drug problem (base=present present)	1.307***	0.255	3.694	[2.241-6.090]
Attending youth centers activities (base= present)	-0.599**	0.162	0.549	[0.400-0.754]
Suspended from school (base= present)	1.259***	0.268	3.523	[2.083-5.958]

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, S.E.: Standard Error, OR: Odds Ratio, CI: Confidence Interval

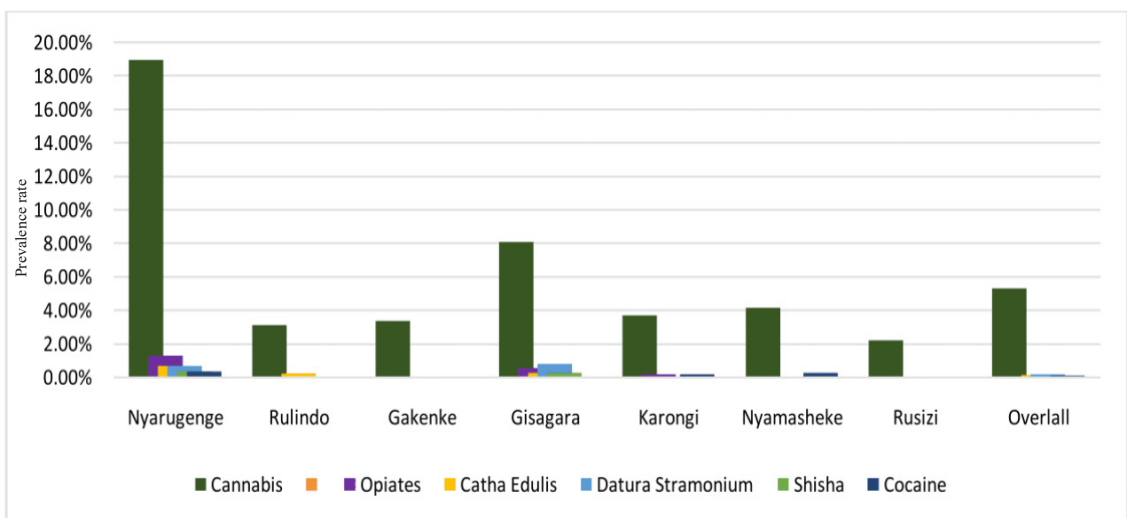


Figure 2: Prevalence non-alcoholic substance use by district

Table 12: Potential determinants of current substance use

	B	S.E.	OR	CI
Gender of respondent (Female) (base = Male)	-1.859***	0.359	0.156	[0.077-0.315]
Aged above 18 years old (base = below 19)	0.555**	0.232	1.743	[1.106-2.747]
Peri Urban (base= Urban)	-0.779**	0.295	0.459	[0.257-0.818]
Rural (base= Urban)	-0.833**	0.296	0.435	[0.243-0.776]
Schooling (base=attending)	-0.513**	0.235	0.599	[0.377-0.949]
Family conflict (base=present)	0.374**	0.222	1.453	[1.940-2.246]
Unable to afford food (base=Absence of enough)	0.630**	0.240	1.878	[1.173-3.009]
Family history of alcohol or drug problem (base= not present)	0.860**	0.330	2.364	[1.238-4.515]
Suspended from school (base=Suspended)	1.562***	0.312	4.766	[2.584-8.79]
Availability on Drugs in community (base=Hard)	-1.369***	0.247	0.254	[0.157-0.413]
Attending youth centers activities (base=attend)	-0.406*	0.230	0.666	[1.345-1.425]
Constant	-2.472	0.426	0.084	

(***) $P=0.000$, (**), $p<0.05$, (*), $p<.10$, S.E.: Standard Error, OR: Odds Ratio, CI: Confidence Interval

in households mainly emanated from drugs and substance use, escalating to mental health issues.

The Security Institutions interviewed noted that a number of adolescents and young people have

Table 13: Alcohol use and other mental illnesses

	Current alcohol use				OR	CI
	Yes		No			
	Count	%	Count	%		
Major depressive current episode						
Yes	94	9.0%	90	4.0%	1.067	[0.653-1.745]
No	950	91.0%	2167	96.0%		
Major depressive past episode						
Yes	110	10.5%	104	4.6%	1.672**	[1.066-2.066]
No	934	89.5%	2153	95.4%		
Suicidality						
Yes	44	4.2%	46	2.0%	1.295	[0.820-2.044]
No	1000	95.8%	2211	98.0%		
Generalized anxiety disorder						
Yes	142	13.6%	134	5.9%	1.992**	[1.511-2.626]
No	902	86.4%	2123	94.1%		

OR: Odds Ratio, CI: Confidence Interval

formed street families and zones with rampant use of alcoholic beverages.

The health workers interviewed at Rutongo District Hospital reported that they commonly received cases of adolescents and young people with psychotic symptoms like hallucinations, delirium and in schizophrenic state due to consumption of drugs and substance use. Some cases received at the Rutongo District Hospital IOSC reported violence and injuries from patients/clients who were under the influence of drugs and other substances. In rural area the most frequently

consumed drugs are a local alcoholic drink called “Kanyanga, Nyirantare, Imanurajipo, etc.” and cannabis.

Here is a verbatim quote from a participant regarding the risk factors: “*Some elements are at the origin: conflicts in family where adolescents and young people are traumatized preferred to flee their families, young people who look easy life, large family with many children who don't have sufficient means where some children flee their family. There are also adolescents and Youths who are born of prostitutes*”.

Table 14: Factors related to Alcohol and substance use

Variables	B	S.E.	OR	CI
Have you had sex in the past 12 months? (base=No)				
current use of alcohol		0.093	3.474	[2.897-4.166]
Current use of cannabis		0.289	2.405	[1.365-4.239]
Other severe and very severe narcotic drugs	0.187	0.311	1.206	[0.656-2.217]
Have you ever had unprotected sex in the past 12 months?				
current use of alcohol		0.108	3.000	[2.426-3.710]
Current use of cannabis	0.756**	0.311	2.129	[1.157-3.918]
Other severe and very severe narcotic drugs	-0.036	0.338	0.964	[0.497-1.871]
Have you ever been pregnant? (for female)				
current use of alcohol	-0.207	0.149	0.813	[0.607-1.088]
Current use of cannabis	-0.731	0.763	0.482	[0.108-2.146]
Other severe and very severe narcotic drugs	-1.224	0.921	0.294	[0.048-1.790]
Have you ever had an abortion in your life?				
current use of alcohol	-0.207	0.149	0.813	[0.569-4.155]
Current use of cannabis	-0.731	0.763	0.482	[0.015-23.91]
Other severe and very severe narcotic drugs	-1.224	0.921	0.294	[0.043-65.73]
Have ever did abortion in your life?				
current use of alcohol	0.43	0.507	1.537	[0.569-4.155]
Current use of cannabis	-0.52	1.885	0.594	[0.015-23.91]
Other severe and very severe narcotic drugs	0.522	1.869	1.685	[0.043-65.73]
Has anyone ever tried to make you have sex against your will but did not succeed				
current use of alcohol		0.102	2.103	[1.721-2.570]
Current use of cannabis	-0.112	0.344	0.894	[0.455-1.754]
Other severe and very severe narcotic drugs	0.381	0.359	1.464	[0.725-2.958]
Has anyone ever physically forced you to have sex and did succeed?				
current use of alcohol		0.126	1.868	[1.459-2.392]
Current use of cannabis	-0.048	0.429	0.953	[0.411-2.207]
Other severe and very severe narcotic drugs	0.085	0.455	1.089	[0.446-2.657]

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, S.E.: Standard Error; OR: Odds Ratio, CI: Confidence Interval

Gender and drug abuse

Some participants from Gakenke and Rulindo Districts expressed that the local liquor called “Kanyanga” was trafficked from Uganda via Gicumbi and Burera Districts, then transported by groups of Youthful Boys called “Abarembetsi” to their destinations.

The security authorities deployed the boys at Transit Centers for systematic screening of the adolescents and young people who were jailed, observed that there were more adolescent boys arrested as compared to adolescent girls.

Here are verbatim quotes from a Respondent on the aspects of gender and substance abuse/trade amongst boys and girls:

“Most of them are boys since they are the ones who are caught in malpractices as a result of taking drugs. Also, boys start drinking beer at early age and this makes them take drugs at young age; boys are even the ones who mostly drop out of school to be engaged in money making activities hence started taking drugs”.

“Adolescent boys and boy youth are affected by drugs and substance use more than adolescent girls and girl youth. During roundup by the authorities, adolescent boys and youth boys are more commonly arrested and transferred to Rushashi Transit Center (Gakenke District)”.

“Adolescent's boys and youth's boys are mostly observed because they are jobless, dropped out schools, impact of socio Medias, they are observed in centers where drugs and substances use are reported by Security Institutions. Employments of youths in town are not enough where some zones are the centers of drugs and substances use. Adolescent's boys and young people boys are also observed near streets and roads and are arrested during roundup. Adolescents' girls and youths' girls are also arrested, but few, because their security is guaranteed by their families more than boys”.

At the Nemba District Hospital IOSC, *“I regularly receive many boy clients as a consequence of drugs and substance use. There are other cases I received of Sexual Transmitted Infections (STI) testimonies that they contaminated STI due drugs and substance use”.* Students in secondary schools who consume drugs and others substance are also received and treated in our services brought by

responsible of schools. After in depth conversation with them, some adolescents and youth certified that they abandoned themselves to consume drugs and other substance.

The study also showed that young boys easily became addicted to Betting Games like “Betika” where it was observed that they consumed drugs and other substances due to peer pressure and ease of access in such locations as alternative entertainment/pass time.

The respondents additionally noted that *“Some GBV crimes were committed against children, adolescents and youth girls driven by drug and substance abuse”.*

Prevention and treatment measures for drugs and substance abuse

The study targeted public sector authorities. Some of the respondents noted that they experienced overwhelming cases of young boys and girls heavily immersed in drugs and substance abuse. Here is a verbatim quote from a respondent: *“The authorities have been organizing some sensitization sessions to identify issues of drugs and substance use in households (HH), and dialogue with children facilitated by Inshuti z'Umuryango. This was in collaboration with partners involved in rights and protection of children, and carries out sensitization on how to fight drugs and substance abuse, and sensitization on Gender Based Violence (BGV) in households (HH)”.*

The District Authorities have a schedule applied for repatriation and home visit of adolescents and young people within their families. Adolescents and young people suffering drug addiction and substance abuse are transferred to Rehabilitation Centers. Aspects of drugs and substance use among adolescents and youth are managed by the office in Charge of Social Affairs at Sector level, office in Charge of Social Economic Development (SEDO) at Cell level and Inshuti z'Umuryango (Light Mom and Light Dad).

Other actions include sensitization in both primary and secondary schools through clubs, headed by youth volunteers, created to champion fight against drug and substance use, and during the annual Kagame Cup football tournaments. There were also sensitization sessions during the monthly Public General Assembly meetings where the District authorities provided key messages on

campaign against drugs and substance use.

The crucial draw-back remains the porous land borders (traffickers easily evade/by-pass drug nets) with neighbouring Countries where imported goods are sourced from, that is DRC, Tanzania, Burundi and Uganda).

The study established that there were also other partners involved in providing strong sensitization to youth and adolescents on Drug Demand Reduction (DDR) and substance abuse. The organizations include the African Evangelistic Enterprise Rwanda (AEE), Action Aid Rwanda, World Vision Rwanda and other Development partners. The aforementioned partners worked in strategic collaboration with the Rwanda National Police (RNP) at District level in organizing awareness campaigns.

Main types of drugs and substances used by young people

It was not surprising that the participants in the study ably listed the main types of drugs and substances consumed by young people in their regions without hesitation. Some drugs and other substances were specific to certain Districts such as heroin in Nyarugenge District and other drugs and substances for other Districts.

The respondents mentioned different narcotic drugs as presented in the subsequent section. The respondents expressed that adolescents and young people commonly used drugs and unauthorized drinks. The following excerpts show the verbatim quotes from the respondents:

"I can say adolescents and young people ordinary consume authorized drinks and unauthorized drinks: local liquors like Kanyanga, Muriture, Nyirantare, Vubi and drugs: Mugo Cannabis Sativa, Tunel, glues and paints"

"Adolescents and young people consume also very dangerous: Cannabis Sativa Mugo, others herb they chew on, few cocaine, tablets (Medicines);

Other intoxicants, illicit and local drinks mentioned included: *Muriture, Nyirantare, Vubi and drugs (Mugo Cannabis Sativa, Tunel, glues and paints); Yewemuntu, Ubudungeri, Umunanasi, Isiyanone, Suruduwire, Igikwangari, Umutobe, Ruyaza, Igikwangari, Muriture, Munturinde, Kagage, Agatobe, Chief Waragi, Mutarabanyi, Akayuki, Gubwaneza, and authorized drinks like Uganda Waragi etc.*

Many respondents evoked other substances

consumed by adolescents and young people like Essence (through inhalation) and dangerous like Mayirungi and Rwiziringa.

In Nyarugenge District, the most commonly consumed drug was Cannabis Sativa The adolescent youth and boys also chewed Mugo and other herbs, Mayirungi, Cocaine (quite expensive and consumed by adolescent girl and girl youth as well) and some "prescription" tablets.

Reports from the Rulindo District Police Commandant observed that Cannabis Sativa was very common. The study team also established that Rwiziringa and unauthorized drinks such as: Utuyuki, Muriture, Nyirantare and Kanyanga were brought in from the neighboring Gicumbi District. Glue was also observed. Kanyanga and authorized beers named Gin packaged in glass bottles, Rwiziringa on the part of Nyabarongo in Shyorongi Sector (Rutonde, Kijabagwe, Muvumu cells) tobaccos and authorized drinks were consumed at high level. They specialized in making beer cocktails to obtain high liquor saturation in beers.

In Gakenke District, the study team established that there were those who were arrested because of consumption of Kanyanga and Cannabis trafficked from Uganda, besides various other unauthorized drinks rampantly consumed here. At Gisagara District there is Cannabis and unauthorized beers such as Nyirantare and Igikwangari, Chief Waragi and Dunda Ubwonko (all locally brewed gins).

The Drugs identified by the study team as commonly used by young people in Karongi District were Cannabis and illicit alcoholic beverages like "Yewemuntu.". In Nyamasheke District, the most common drugs consumed included Cannabis, and illicit brews included "Umutobe", Ruyaza, Chief Waragi, , Igikwangari, Muriture, Munturinde, Kagage, Agatobe, etc.).

In Rusizi District the common drug is Cannabis, and illicit alcoholic beverages such as Kanyanga, Makwanjari, Mutarabanyi and Muriture. Cannabis and different illicit brews such as "Akayuki", "Gubwaneza", are very common in Bugarama sector and Muganza and also Makwanjari which are very common in Gashonga, Rwimbogo and Nzahaha sector.

Most rampant types of drugs and substances used

The study established that the drugs most rampantly consumed by the adolescents and youth were Cannabis Sativa, Glue, Mugo, and Suruduwire.

Glue was most easily available, accessible and affordable. Its consequences also manifest very quickly. Cannabis is available in different zones as reported by the Security Institutions, and its price of between 100 RwF – 200 RwF is affordable for consumers.

Even though cannabis is consumed at high level, the youth and adolescents who secretly consumed it, can be observed when they begin to manifest its side effects. Rwiziringa, a local herb, was also consumed rampantly. The youth consumed concoctions of beer cocktails with high saturation of alcohol and effectiveness to concoctions. Here is a verbatim quote from a respondent:

“Unauthorized drinks are also mostly used by adolescents and young people because the prices are very low. I also noticed that many adolescents and youth mainly consumed various drinks, such as Dundubwonko, Nyirantare, Umumanurajipo, and Utuginga. Makwanjari is unauthorized alcohol beverage which is brewed by local communities and was thus easily available and affordable” to the youth and adolescents.

Channel of supply of drugs and substances used in the community

The study established that the silence displayed by the community members in regards to drugs and substance use contributed to the spread and distribution in the targeted Districts. The study team noted that parents must contribute enormously to fight against trade in drugs and other substances used in their communities.

Specifically, the respondents mentioned concrete channels of drugs and substances in their respective Districts:

Nyarugenge District: Adolescents and youths supply drugs amongst themselves. Nyarugenge District is located at the center of Kigali City and it is the center for everyone who enters and leaves the District. The really, question would be addressed to Security Institutions because oftentimes drugs such as Cannabis are trafficked from neighbouring countries.

Unauthorized drinks are produced in and by the citizens of Rwanda. Drugs observed are coming from neighbouring Countries: Democratic Republic of Congo and Tanzania for Cannabis Sativa, and Kanyanga from Uganda. Unauthorized drinks manufactured in Rwanda: Nyirantare, Yewemuntu, Vubi and authorized drinks such as Gin. Here are verbatim quotes from respondents:

“I see that drugs are imported by Traders who have distributors in different zones. Some drugs and other substances are trafficked from neighboring countries by unknown businessmen”. “I know of some drugs that were imported from Australia consumed within Nyamirambo, you see that the drugs are brought from Countries that are far away”. Exchange of drugs among adolescents and youth is as a result of keeping bad company and peer pressure. There are unknown businessmen who trade in Cannabis and illicit drinks making huge profits.

“Kanyanga is trafficked from Uganda through Gicumbi and Burera Districts while Cannabis Sativa is from the Democratic Republic of the Congo (DRC) through the Goma – Kigali”.

“Unauthorized/illicit drinks are produced in rural zones on the one hand and authorized drinks are produced in Rwanda and imported as well. If you see well, we observe three routes: (i) Rubavu-Kigali international road from Democratic Republic of the Congo, (ii) From Kigali, (iii) and as neighbour with Gicumbi and Burera Districts where drugs are trafficked from Uganda to neighbouring countries”.

Drugs and other substances are trafficked from neighbouring countries into Rwanda: Kanyanga from Uganda and Cannabis Sativa from the Democratic Republic of the Congo and also locally by citizens who cultivate it in privately secluded environments. Kanyanga is manufactured in rural zones in Rulindo District and Cannabis is distributed by traders in hiding. Rulindo District is neighboring Gicumbi where Kanyanga and Cannabis are trafficked from Uganda and transported by groups of Youths called “Abarembetsi”.

Here are verbatim quotes from some respondents: *“If I check well, I see Cannabis is coming from Uganda, the neighboring Country and additional quantities are coming from Kigali. There is high level businessman who distributed it in Masoro, Ntarabana, Murambi Sectors and small zones of Burega Sectors where there are exploited mining activities”.*

“Drugs and substances (Kanyanga and Uganda Waragi) come from Burera District passing through Kamubuga Sector neighbor with Burera District where they are supplied from Uganda”. There is no wholesaler center of drugs and substance use known in Gakenke District, but this is the transit

area of drugs. The same respondent said “the reasons are that is neighboring with Burera and Musanze Districts which are neighboring with Uganda and Democratic Republic of the Congo”. “I can find some few citizens who cultivate Cannabis who said that It is used to treat some livestock diseases: stunting of goats, gout, diarrhoea and as appetizer”. Many illicit drinks are made in Rwanda: Ngufu and Esperanza. The anatomical physical conditions of young people make them more susceptible to intoxication. The way the drinks are packaged in small quantities makes it accessible and affordable to the youth and adolescents can consume that without problem. Some quantities of Cannabis Sativa come from Kigali and are also distributed in the District”.

The thriving trade in Cannabis is facilitated by the International road that crosses Gakenke District from the Democratic Republic of Congo (Goma), and from Uganda (Cyanika). Some unauthorized drinks are manufactured in the communities of Gakenke District while authorized drinks are manufactured for distribution in the country; other drinks are imported from neighbouring Countries. “Traffickers of cannabis into the country are known and this makes it easy for drug addicts to buy it confidentially. Unauthorized drinks are brewed in the community and are easily available, Cannabis is imported from neighbouring Burundi and the consumers are conversant with the cannabis traffickers making it easy to push”.

“Nyirantare is brewed in their residential areas, and in the rural areas and thus easier access. Most of the sellers do their businesses in bushy areas where the illicit beer is given to clients; therefore, the youth know where to get the illicit beers there is a well-known group of people who traffic it into the country and the youth buy it from these people since information on the whereabouts of cannabis is shared”. Additionally, as Rwandans and Burundians share fields of land by Akanyaru River, they meet and share it easily.

“Unauthorized alcoholic beverages are mostly brewed by local citizens, but Cannabis comes from the Democratic Republic of the Congo (DRC) and generally trafficked through border areas such as Rubavu, Rusizi, Nyamasheke and Rutsiro, but it is not easy to know who imports it into our District”.

“Due to the high cost of Cannabis, everyone wants to invest in Cannabis. Some quantities of Drugs

are coming from Kigali”.

“Young people get Cannabis Sativa easily because there are people who cultivate it in their homes but you don't know the farmers, there are others from the DRC, where unauthorized alcohol is made in the area where they live”. There are also people who cultivate it, said that “claiming that they are feeding their livestock and to increase their appetite to craze”. Drugs are passed on to young people from their grand brothers who buy them from their local traders, often as “Kanyanga” and Cannabis from outside the region while illicit liquor is being made in the community.

“They buy it from producers and importers because they know the traders around the region and they share it with each other due to their friendship, those who want it know where to buy it and it is easy to find”. Traders are often familiar with the consumers, making it is easy to sell.

“They buy it because they travel in groups, so they are exchanging information on where drugs are sold” and continue saying “In addition, an unauthorized alcohol beverage is being brewed by the local population. They often tell us that they have groups which help them in trafficking the drugs but when they come to us, they have already been affected by side effects due drug and substances use”. Some drugs are cheaper; children, adolescent girls and boys, younger girls and boys steal money from their parents and go to buy drugs. But there are also among them who are given drugs by their peers.

Perception of factors of drug and substance use

The study established that drug abusers are observed in different centers and streets. Most adolescents and young people immersed in drugs and substances use are located at the slum's zones. The respondents noticed that most adolescents and young people who consumed drugs and other substances have dropped out school or have completed school and have showed behaviors of delinquencies.

Here is a verbatim quote from a respondent: “I think that more than 90% of them did not attend school, and these who have completed only primary school level, even these who are in Universities and High Institutes consume and they are addicted to drugs and substances use. I observed that adolescents and young people in secondary schools used drugs and substances”.

Socio-economic situation

The study established that families with frequent conflicts often had their adolescent and young adults flee from home to engage in drug and substance abuse. The study also established that adolescents and young people in search of employment within and around public markets often engaged with negatively influential peer Youth groups. It was noted that Adolescents and young people from rural zones often met the challenge of shelter/accommodation on arrival at the urban areas, and they commonly end up being substances abusers themselves as they get integrated into drug addicted groups for survival. The following verbatim quotes describe the situation in terms of socio-economic status of the respondents:

“Adolescents and youth who use drugs and substance use both come from wealthy and poor families, but those who come from wealthy families consumed Mugo which are comparatively very expensive at 2500 RWF per unit, Cocaine, Heroin, Cannabis and various strong tobaccos”. The same respondents confirmed that “Those from poor families consumed unauthorized drinks as follows: Nyirantare, Muritye, and Vubi continued saying”. There are some cases where adolescent and young people fled family because their families have divorced.

“If people observed very well, consumers of drugs and other substances are mostly found both in Ubudehe Category 1 and Category 2 as well as those from wealthy families. For example: If adolescents and youth can go study in China and India is that these people are coming from wealthy families despite taking drugs. It's known that they consumed drugs because they have been expelled by its countries in fact that they had been arrested consuming drugs and other substances. About 98% of adolescents and Youths arrested and transferred in Transit Centers have families. Few orphan's adolescents and youth are observed in drugs and substance use.”

“There are adolescents and youths who have parents who sell street food where their parents do not have sufficient means to feed them, also adolescents and youth who fled families with frequent conflicts and come in urban areas of District to find employments and consume drugs easily.”

“Kanyanga are transported by adolescents and

young people where some of them are motivated by their parents where they expected to obtain a lot of money both from in wealthy and poor families”. This affirmation was supported that two Districts are neighbors with Burera District where the traffickers found easily the ways from the neighbor country (Uganda).

“Adolescents and young people who the head of households (HHH) told me at the (IOSC) and at the same time at the Mental Health service of District Hospital that “His brother is drunkard”. It notices that its adolescents and young people seek refuge in alcoholic beverages.

For adolescents and young people observed living near streets and roads where they are found after fleeing their families due to conflicts, hunger, or still grieving from parental loss, lack of family support or abandoned by their families, majority of them indulged in inhaling glue.

Here is a verbatim quote from a respondent: *“Polygamous observed in Kamubuga sector / Gakenke District where the principal of gender balance is very lack in this sector because the respondent said also that “I received many cases from this sector at the IOSC at Nemba District Hospital.”*

Root causes of the problems of drugs and substances use

The study found that some causes are similar in some Districts, but others are specific to other Districts. The key informants from different Districts noted the following root causes: conflicts in family, harassments, large family with many children and limit resources, lack dialogue between parents and children, misuse of social networks by young people and adolescents, different movies, lack of hope for the future, lack jobs, and bad friend due peer youth company. Other respondents expressed: *“Many adolescents and youths said that there are no people who can take care for them to create employment”*. Faced with large problems with difficult to resolve it, young people prefer to indulge in drugs and other alcoholic beverages.

“I can point out poverty in HH. I observe adolescent and young people from wealthy families due to bad friends of peer youth. Adolescents and youth have been accused that they miss basic moral education and the Problems of orphan's problems”.

At Gisagara the Burundian border makes it easy

for the youth to obtain Cannabis. *“The problem is that the poor thinking of the population, the fact that they live near borders, which makes it easier to get drugs”*.

The fact that population lives near the Nyungwe National Park Forest (Ruhambuga, Bushekeri, Rangiro, Cyato and Karambi Sectors), lives in a border area with Democratic Republic of Congo (DRC), these are two elements that make the people to be involved in drug trafficking”.

DISCUSSION

A household based cross-sectional survey was administered to adolescent and young adults aged between 13- and 24-year-old (N=3301) to assess alcohol use, social and hard substance use behaviours across 7 districts implementing the BARAME project. As mentioned in the results section, the 30-day prevalence of alcohol, cigarettes, cannabis and other illicit drugs use was respectively 28.54%; 2.9%; 4.36 %, 0.92%. The WHO average rate of tobacco use among young people aged 15-24 was 17.0% in 2015; estimated to be 15.5% in 2020 and projected to be 14.2% in 2025 [19].

Alcohol abuse or binge drinking varies across districts and the proportion of adolescent having binge drinkers are higher in Nyarugenge, Nyamasheke and Gisagara districts than in other districts. Binge-drinking pattern also increased significantly in youth aged 18 and above.

Cannabis is the most prevalent illicit drug in our sample probably due to its low cost and accessibility (the cannabis ball cost= 500 -1000 Rwandan Francs). Adolescent cannabis-use prevalence rates in Nyarugenge (19.0%) are 3 times higher than the average of other districts (5.3%). Nyarugenge district is in the capital city with a unique socio-demographic profile. Furthermore, the selected villages in Nyarugenge are 90 % urban (much higher than the other districts) where cannabis may be possibly more accessible. Cannabis-use prevalence rates are also elevated in Gisagara (8.1 %) compared to the average of other districts. The lowest average prevalence rates for cannabis use are found in Rusizi (2.2%), Rulindo (3.1%).

Cocaine is certainly the less available and the most expensive drug on the Rwanda market (1 gram of cocaine = 150.000 Rwandan Francs; it can be sold in small cocaine bags with an average bag weight 0.1g). Consequently, the number of cocaine users

is very low (3 respondents = 0.09%) and restricted to the capital city (Nyarugenge) or districts bordering with neighbouring countries (Karongi, Nyamasheke). Heroin is a bit more available and accessible by youth (1 gram of Heroin = 50.000 Rwandan francs; Heroin is also sold in small bags of about 0.1g = 3000- 5000 Rwandan francs) and the adolescent opiates lifetime prevalence (17 respondents = 0.5%) or past 12 months prevalence (13 respondents = 0.39%) is relatively higher than for cocaine. Heroin users were also found in 3 specific districts (Nyarugenge = 1.3%; Gisagara= 0.5% and Karongi =0.2%).

It is very difficult to make exact comparisons of rates of alcohol and substance use behaviours between our study and other investigations because various studies did not necessary used the same age range (13-24), used a different recruitment strategy for the participants, or were not conducted in similar contexts. However, we can explore what others studies found in Rwanda or in sub-Saharan African countries about teen and young population. In a study by Kanyoni, Gishoma & Ndahindwa (2015) conducted in 2011 in Rwanda (5 out of 7 districts selected in the current study were part of sampled districts - Gakenke, Rulindo, Karongi, Nyamasheke, Nyarugenge), the prevalence rate of substance use over the month prior to the survey was 34% for alcohol, 8.5% for tobacco smoking, 2.7% for cannabis and 0.1% for other hard drugs. Although there are some differences, rates of alcohol user remained fairly constant, whereas rates of cannabis use almost doubled from 2.7% to 4.7%. It should be noted that the sample in the current study is younger than youth sampled from the study by Kanyoni et al [6] that considered the age range of 14–35 years old. There is also a marginal increasing trend of opiates (0.08 % of youth aged 14-35 years old reported to have used heroin in the 2011 versus 0.39% of youth aged 13-24 years old who had used heroin in the 2020). The present finding also suggest that there is a decreasing pattern of tobacco smoking.

At the continental level, Olawole-Isaac et al [15] conducted a systematic review and estimated the lifetime prevalence of substance use among adolescents in sub-Saharan Africa based on 27 selected population-based studies across sub-Saharan Africa. These studies included 143 201 adolescents (age 10 – 19; mean age 15.6 years) and were conducted between 2000 and 2016. Authors reported an overall pooled prevalence of 32.8% for

alcohol, 23.5% for tobacco products, 15.9% for cannabis, 4.0% for heroin and 3.9% for cocaine. Levels of lifetime substance use found in our study (54.1% for alcohol; 4.45% for tobacco, 9.3 % for cannabis, 0.5% for opiates, 0.1 % for cocaine) are generally lower than pooled prevalence rates reported in sub-Saharan Africa; except for alcohol (levels of alcohol use are significantly higher for our sample).

Current prevalence's (past month use) of alcohol, cigarettes, cannabis, opiates and cocaine found in our study are also lower than those reported from relatively higher income countries in the sub-Saharan Africa region, e.g., South Africa, Nigeria, Ethiopia and Kenya [2], [20]–[23]. However, the proportion of the youth consuming different substances in our study is relatively comparable to other low-income countries in sub-Saharan Africa region such as Uganda, Tanzania and Sudan [24], [25]. The rates of alcohol and cannabis use are generally comparable to averages found in these low-income countries but estimates of tobacco and hard drug use are a bit lower for our sample.

Episodic excessive alcohol consumption or binge drinking was particularly assessed as a variable of interest for adolescent in the present study. Roughly, one in seven male (13.7%) and one in thirty-seven female (2.7 %) among adolescent and young adults sampled were found to engage in binge drinking. These data suggest the importance of prevention programmes for alcohol abuse in Rwanda but are much lower than binge drinking rates found in South Africa where the prevalence for recent binge drinking among youth aged 15-24 years was found to be 31% for male and 17.9 % for female [20].

In the current study, the age of onset of substance use for most of the youth falls in the middle of adolescent period (13-18 years). This finding is in line with other findings across the world, including in Africa [26]. The other key findings of this study is that 3.6% and 1.2% of the youth in the 7 districts considered, met respectively diagnosis criteria for alcohol use disorder and non-alcoholic psychoactive substance use disorders on the M.I.N.I. The use of M.I.N.I. diagnostic criteria concluded a significant substance abuse and dependence problem that may be defined as "a clinical condition" to be referred to health care providers. Our results are consistent with worldwide findings reported in the literature [27].

In order to cross-validate results from self-reports questionnaires, the study team requested to every 10th participant on the sampling list (using a regular interval) to voluntarily submit biologic samples (urines). 376 urine specimens were tested qualitatively using rapid Huma drug tests for marijuana (THC), opiates, Cocaine, Amphetamines and Methamphetamines. Of the 376 participants who had a qualitative urine test, 353 (93.8%) had a negative result for all substances. Of those who tested positive for at least one substance (23/376), urine samples were analysed for confirmation by lab technician of Isange Huye Rehabilitation Center with the Mass Spectrometry Technique. Overall, the prevalence for cannabis was 5.6% (21 participants tested positive) and was slightly higher than the rates from interviews (4.4 %) while the prevalence for recent opiates used was identical (0.5%). Urine tests did not confirm the presence of cocaine, amphetamines and methamphetamines. It is not relevant to compare biological substance use data from this sample to other studies as there is no closest reference study in the sub-Saharan Africa region conducted on the same age range (13-24). The majority of studies using biological samples (urine, hair, or bloodspots) are conducted in adult or in youth in Asia or western countries [28,29].

The study team carried out bivariate and multivariate analyses to assess associations between social and hard substance use behaviours and other relevant variables. The odds of engaging in alcohol and substance use were examined for each of the risk and protective factors. As hypothesized, and consistent with other studies, regression analysis showed that male gender, older age, history of family conflict, serious physical violence in the family circle, history of losing parents or a close relative, family history of alcohol or drug problem, inability to afford food, history of unintended pregnancy, suspension from school, living in urban areas, availability of drug in the community are significant predictors of alcohol and drug use. Our findings also suggest that adolescent and youth who have a history of anxiety and depressive disorders have twice greater odds of using alcohol, cannabis and other hard drugs than those not depressed.

Our findings converge with those reported by other studies. Previous studies have identified demographic, adolescent and youth emotional

health, parental factors, peers and contextual risk factors as determinants for substance use among youth. A study conducted among South African adolescents found an association between substance use and multiple psychosocial factors including, adolescent personal attributes, parental attributes (drug use), and peer factors [30].

Another study conducted in a sample of youth in Ethiopia found that family history of alcohol and substance use, siblings' use of substances and friends' use of substances were factors positively associated with substance [22]. Other studies, mainly conducted in south Africa, found that male gender, history of abuse, presence of internalizing or externalizing disorders, peer or sibling substance use were significantly related to increased risk for substance use [20,31,32]. A number of studies have also established that depression and anxiety often predate substance use behaviour [33].

Our study findings also suggest that there is a clear association between alcohol / substance use and sexual and reproductive health variables. Not surprisingly, adolescent currently abusing alcohol and cannabis had more the risk of having unprotected sex in the past 12 months compared to those who do not use these substances. When developmental changes during adolescent are associated with family issues (such as conflict, parents using alcohol), it creates a conducive environment for alcohol and substance use and makes adolescents vulnerable to SRH risks.

The association between alcohol, substance use, sexual risk behaviours and sexual victimization among adolescents has been documented in previous studies internationally and in Africa. A household survey in South Africa found that alcohol and substance use decreased awareness of social norms or perceptions of acceptable behaviour among youth and was linked with an increased number of sexual partners, regretted sexual relations, inconsistent condom use [34]. Disinhibition resulting from alcohol and substance impairs decision-making around sex and undermines skills for condom negotiation and correct use.

The qualitative interviews conducted with key informants (local stakeholders) revealed that drug and substance abuse among adolescents was a problem in all the surveyed districts. This study identified three common themes that illustrate the

extent of drug and substance abuse problems in the seven districts. First, there is evidence of drug and substance abuse as cases of adolescents and young adults who consume drug are logged into databases in all transit centers. Second, adolescents and young adults arrested during roundups are sent to Iwawa treatment center. Third, participants mentioned several types of drugs and substances used by young people (cannabis, Rwaziringa, illegal drinks: Kanyanga, Muriture, Nyirantare).

Other facts are that there are many zones where adolescents and youth are met using drugs and other substances. There are acute cases addicted by drugs that are brought also to District Hospital by their families to be treated by health professional. The respondents say that Gender Based Violence in households had the origin in drugs and substances use and other cases are received with mental health issues.

Furthermore, participants observed a number of reasons that lead to drug and substance use. Drugs are available and accessible to adolescents and young people in different locations in all districts. Additionally, adolescents and young people consume drug in an attempt to cope with problems especially violence at home (for example gender-based violence) and mental health difficulties. The use of drugs causes a wide range of adverse consequences. It leads to physical health complications that are treated at district hospitals. Consumption of drug and substances among young people lead to mental health problems and disorderly conduct in on the streets and in the community. Moreover, young people who consume drugs are at the risk of committing or enduring sexual violence. Isange One Stop Centers' workers reported having cases of sexually transmitted diseases that young people link to their use of drugs.

From the analysis of the interviews, it becomes apparent that local leaders and stakeholders are aware of the growing problems of drug and substance abuse. Consequently, a number of measures were adopted to reduce the extent of the problems. Local leaders, in collaboration with development partners involved in child rights protection, carried out sensitization activities about the drugs and substance use and its causing factors. These activities are conducted at the community levels and in schools. Particularly, in primary and secondary schools, sensitization clubs and activities have been put in place to educate

young people about the dangers and consequences associated with consuming drugs. It is noteworthy to mention the important involvement of several government institutions' representatives such as the National Council of Children, local leaders in charge of social affairs, socio-economic development.

There seem to be a wide range of illegal alcoholic drinks and some are specific to particular locations. The use of inhaled gasoline, paint and glue was reported in different districts. Further, Nyarugenge presents particularities as participants reported the use of more synthetically sophisticated substances such as heroin (Mugo), cocaine, and prescription tables. The finding that many Rwandan young people use cannabis is in accordance with a 2003 UN report that showed that cannabis is most frequently used illicit substance in all regions of the world. Worldwide, among students who consumed drugs, 90% of them used cannabis [1]. Illegal alcoholic beverages represent a serious problem because they are readily available to young people. Because they are made locally, their prices are cheap and young people can afford them. In some cases, young people learn how to consume these drinks from their parents who also consume them. The issue of drug use concerns border and security authorities especially in terms of drug trafficking. Some drugs are introduced in Rwanda from neighboring countries. Once in the countries, drug traffickers have distributing agents in different areas. Other drugs such as illegal alcoholic drinks and cannabis are produced in Rwanda and distributed in the community. Previous studies have projected that the problem of drug and substance abuse will continue to increase in the future and have concluded that breaking the cycle of production, transportation and consumption of drug remains a high public health priority [35].

About the determinants of drug and substance use among people, participants noted that these problems are common among young people without any occupation, but also among those who are in schools. Drug use is observed among young people from both financially stable as well as disadvantaged families. It also affects young adults who hold low paying jobs such as handymen.

The major limitation of this study is that the sample was limited to youth who were present at home during daytime on the day the study was

undertaken. Thus, the data collected represent the prevalence of youth found at home during the data collection period [November 2020] and thus not represent youth who were not at home during data collection. We cannot exclude that the latter group might have different characteristics, including alcohol and drug behaviours, compared to our sample group.

The limitations of this study also include the design: our findings are based on data from a cross-sectional survey and it is therefore not possible to make causal inferences.

There are also considerable strengths to this study. To our knowledge, there have been few studies that have documented the prevalence of alcohol and substance use among youth in Rwanda. The only existing community-based survey on youth in Rwanda was conducted 10 years ago (November 2011). The present study is also, to our knowledge, the first study on the prevalence of alcohol and substance use among adolescent and youth in Rwanda and East Africa using interview administered questionnaires combined with a biological approach (Urine drug tests).

CONCLUSION

The findings of this study in 7 districts showed that adolescence and young adulthood remains a period of frequent substance use, with high prevalence of alcohol, cigarettes, cannabis and other illicit drugs use. Alcohol and cannabis were the most used substance in the 7 districts considered. The most common factors leading to alcohol and substance use was male gender, older age, history of family conflict, serious physical violence in the family circle, history of losing parents or a close relative, family history of alcohol or drug problem, inability to afford food, history of unintended pregnancy, suspension from school, living in urban areas, availability of drug in the community.

This study points to the need for intervention programs that target adolescent and young adults and the need for continued monitoring of substance use in the future. To reduce both alcohol and substance use and improve sexual and reproductive health in the selected 7 districts, coordinated preventive interventions must operate across multiple levels (individual, family, peers, schools and community levels). Interventions must address a number of factors identified at individual, family, peer, school and community levels. Public

authorities must block ways used by traffickers and map all channels of trading and distribution, keep reinforcing measures to reduce availability and supply of drugs and improve social protection activities for vulnerable households.

MIGEPROF to establish a strong program with key strategies to reach to promote dialogue between children and parents.

Professional medical staff and psychologists

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