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Knowledge, attitudes and behaviours on tobacco, alcohol and other drugs among Nigerian secondary school students: Differences by geopolitical zones

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Abstract

Introduction and Aims. Nigeria is composed of six geopolitical zones plus one Federal Capital Territory. Differences between zones can differentially influence the adoption of risk behaviours by adolescents. This paper aims to describe the knowledge, attitudes, beliefs, risk perception, skills and substance use among Nigerian secondary school students highlighting the differences by geopolitical zone.

Design and Methods. The population size of each zone was taken into account in extracting the 32 schools for the survey. The characteristics of the social environment, tobacco, alcohol and substance use, knowledge, beliefs, risk perception, attitudes, personal skills and school climate were investigated through an anonymous questionnaire.

Results. A total of 4078 adolescents participated in the survey: 5.1% reported they had smoked cigarettes at least once in their life, 33.6% drank alcohol, 13.1% experienced drunkenness, 7.5% used cannabis and 11.6% other drugs. The highest rates of alcohol use were observed in the South, whilst the use of tobacco, cannabis and other drugs was higher in the North. Knowledge about tobacco, alcohol and marijuana was quite low across all zones. Scores for self-esteem, decision-making and refusal skills, risk perception and beliefs were lower in the North.

Discussion and Conclusions. This study shows a high prevalence of adolescent alcohol and substance use in Nigeria. There is a need for planning and implementing evidence-based drug education and prevention programs across the country. Prevention activities targeting adolescents could help to reduce the later life burden of disease related to use of tobacco, alcohol and other drugs.

Introduction

Nigeria is the most populous country in Africa and the seventh most populous in the world. It has an estimated population of over 181 182 000, 22.7% of which is aged between 10 and 19 years [1]. The country is composed of 36 States plus the Federal Capital Territory (FCT). Based on geographical proximity or ethnic homogeneity and other political criteria, the States are grouped into six geopolitical zones: North East (NE), North West (NW), North Central (NC), South West (SW), South East (SE) and South South (SS) (Figure 1).

The geopolitical zones differ from each other in environmental characteristics, population size, patterns of settlement, language, culture and religion, civil unrest and conflicts, historical background and economic resources. Because of such variety, the zones differ widely in health status of the population, including child nutrition, feeding, vaccination rate, fertility rate and reproductive health, prevalence of infectious diseases, risk behaviours and life expectancy [2-7].

These differences also influence the adoption of risk behaviours, including the use of tobacco, alcohol and drugs among adolescents. However, lack of available data does not allow comparison of the prevalence of these behaviours among adolescents across the country.

Moreover, while several Nigerian studies have described parental and friends0 influence on adolescent substance use [8–21], few have investigated personal risk factors (e.g. knowledge, attitudes, and beliefs) and none have investigated risk perceptions and skills. To date, most studies on personal risk factors have focused on cigarette smoking [13–19,21–24] but very few have investigated correlates of alcohol [25–27] and illicit drugs use [20,26,28]. Since all these factors can be related to the risk of initiation and can be modified by specific prevention interventions, it is important to identify which areas deserve health promotion interventions targeting adolescents in Nigeria.

In 2013, the United Nations Office on Drugs and Crime (UNODC), jointly with the collaboration of the Government of Nigeria, implemented a large-scale project funded by the European Union (EU) to support Nigeria0s efforts in fighting drug production, trafficking and use, and in curbing-related organised crime, including counterfeit narcotics and psychotropic substances, a key outcome related to promoting healthy lifestyles in schools, families and communities. The project was organised in partnership with the Federal Ministry of Education (FMOE), the National Drug Law Enforcement Agency (NDLEA), and the National Agency for Food and Drug Administration and Control (NAFDAC).

This paper aims to describe the knowledge, attitudes, beliefs, risk perceptions, skills and substance use behaviours among Nigerian secondary school students who participated in the baseline survey of the project, highlighting the differences by geopolitical zone.

Methods

Sample size calculation for the evaluation project estimated that about 4000 pupils were needed for the study. Considering 45 pupils per class, three classes per school and a 10% drop-out risk, 32 schools were randomly extracted from a list of 60 federal schools available to participate in the EU project and provided by the FMOE. Schools were extracted taking into account the population size of the respective zone so as to obtain a sample representative of the geographical distribution of the population: six schools in NW, four in NE, six in NC, eight in SW, four in SE and four in SS. All 32 schools (4078 pupils) participated in the survey. Participation in the project was submitted to the internal review board of each school. The schools applied internal standards for asking parents' consent for their children to participate.

A self-completed anonymous paper questionnaire was created for the surveys. The questionnaire was a shortened version of that used in the EU-Dap study (www.eudap.net). To preserve confidentiality, the questionnaire was labelled with a 9-digit individual code self-generated by the student. The

questionnaire investigated social environment, tobacco, alcohol, and substance use, knowledge, beliefs, and attitudes about substances, personal skills and school climate.

The questionnaire was adapted to the Nigerian context especially with regard to lexical aspects. Local experts revised the language and the appropriateness of the constructs. A pilot study was conducted in two classes in a school in Abuja in May 2015. The pupils completed a form listing the problems they encountered in answering the questions. The results of the pilot study were incorporated into the final design of the questionnaire. The adaptations went into the final version, including 34 questions. Specific notes were added to facilitate completion of the anonymous code, and a list of Latin letters was added to reduce errors in interpreting the students0 handwriting.

To ensure standardization of questionnaire administration, the UNODC Country Office held a one-day training session for the people administrating the questionnaires. An instruction manual was distributed and the procedures were tested. The questionnaires were administered by local staff between December 2015 and January 2016. Before questionnaire administration, information on the study was provided to the pupils and oral consent to participate was obtained. When completed, the students put the questionnaires in a closed box. They could refuse to participate in the study and could stop filling out the questionnaire at any time point. The overall participation rate was 94.4% of expected. There were very few cases of refusals but there was a certain proportion of absenteeism: less than 2% in all the zones, exception for the NE (5.7%), the NW (17.9%) and the SW (7.1%).

The study was conducted following the principles of the Declaration of Helsinki. Study materials and procedures were approved by the Federal Ministry of Education. Students were informed about the objectives of the study and provided consent to participate before filling the questionnaire. The questionnaire was anonymous; once completed, the students deposited it in a box only the researchers had access to.

Statistical analysis

Sociodemographic characteristics, school performance, substance use, knowledge, beliefs, risk perceptions, attitudes, self-esteem, decision-making and refusal skills across zones were evaluated through descriptive analysis. Attitudes, beliefs, risk perceptions and skills were investigated through multi-item questions with responses graded on a 4-point Likert scale (very likely/likely/unlikely/very unlikely and strongly agree/agree/disagree/ strongly disagree). Responses were scored from 1 to 4 and summed, means were calculated, and categories of high, middle and low level of each indicator were created using tertiles.

Logistic regression models were performed adjusting for age, sex and socio-economic status in order to investigate for inter-zonal differences in substance use behaviours, knowledge, beliefs and attitudes towards drugs. Since the SW was the most developed and populous zone and included the greatest number of study participants, it was set as the reference zone in the regression models. For logistic regression analysis, the responses on substance use prevalence, knowledge, beliefs and attitudes were collapsed in dichotomous outcomes: any use versus no use; one or two correct responses versus no correct response; high versus middle/low positive beliefs; and high versus middle/low positive attitudes. Adjusted odds ratios (ORs) were estimated as measure of association.

Statistical analysis was carried out using STATA software release 12.0 [29].

Results

Sociodemographic characteristics

A total of 32 schools, 96 classes and 4078 students participated in the survey (Table 1). The majority were males. The highest proportion of female students was recorded for the SW and SS zones and the lowest for the NW zone. Most students were 14–15 years old; in the NE and NW zones about half

were over 15 years of age, whereas in the SW, and SS zones about 20% were under 14 years. The mean age was higher in the Northern than in Southern zones (range 14.7–15.8 vs. 14.0–14.6).

Most students lived with both parents; less than 7.5% lived with one parent only, except for the NE and NW zones where the proportion of single parent households was higher. The proportion of students living with other people was, on average, 34.5%, which was higher for the NE and lower for the SW zone. Overall, more than 75% of students lived in families with at least one car and one personal computer; the highest proportion of families without a car or a personal computer was recorded for the NE zone and the lowest proportion was recorded for the NW, NC and SW. In all zones, students had high or medium academic grades at school. The highest proportion of students with low grades was recorded for the NW and the lowest proportion for the SS zone.

Substance use

Figure 2 shows the lifetime prevalence of substance use by age and geopolitical zone: in general, the prevalence of substance use increased with increasing age. This trend was particularly evident in the NW and SW zones, and in NC except for alcohol. In the NE zone, the prevalence of alcohol use increased until age 14 years and then decreased (Figure 2).

The proportion of lifetime smokers was quite low overall, except for the NW (13.4%), and the NE (7.7%) zone: consistently, 7.7% of NW and 3.5% of NE students stated they had smoked cigarettes in the 30 days preceding the survey.

Alcohol was the most commonly used substance recorded for all zones. In all the zones, the proportion of drinkers ranged between 29.7% (NE) and 37.6% (SW).

The highest proportion of students reporting recent alcohol use was recorded for the NW (15.3%) and NE (13.0%). The proportion of students who drank more than six times in the last month was particularly high in the NW zone (11.0%), as was the proportion of students who had experienced a drunkenness episode (8.7%). The highest prevalence of lifetime illicit drug use was recorded for the NW (21.2% cannabis and 26.0% other drugs), followed by the NE (14.2% cannabis and 18.9% other drugs) and NC zone (6.1% cannabis and 9.9% other drugs). Similarly, the prevalence of cannabis and other drugs use in the last 30 days was highest in the NW (7.5% and 9.8%, respectively), followed by the NE (3.1% and 5.7%, respectively), and the NC zone (2.0% and 2.7%, respectively).

After controlling for age, sex and SES, several differences between the zones were confirmed (Table 3). Lifetime use of tobacco, cannabis and other drugs was significantly higher for the NW and the NE zones than the SW zone, whereas lifetime alcohol use was significantly lower for the NW, NE and NC zones than the SW zone. Besides NW and NE, lifetime cannabis use was significantly higher also for the NC than the SW zone. Moreover, lifetime cannabis and other drugs use were significantly lower for the SE zone.

Recent cigarette smoking was 4.87 times higher for the NW than for the SW zone, cannabis use was 5.78 times and use of other drugs use was 2.93 times higher. Besides NW, recent use of cigarettes, cannabis and other drugs was significantly higher (2.65, 3.38 and 1.88 times, respectively) also in the NE than the SW zone.

Knowledge, beliefs, attitudes and risk perceptions

As regards knowledge, the rate of correct responses was quite low, especially for the item on the relationship between nicotine and lung cancer (lowest scores recorded for the SS and SE zones, where only 2.7–2.9% of students responded correctly; the highest scores were recorded for NW zone, where 6.9% responded correctly). Only in the SE and the SS zones over 50% of students responded correctly to the item on tobacco addiction. The highest proportion of students who responded incorrectly to this item was recorded for the NW zone (Table 2 and Table 3).

Only to the item on sex differences in alcohol tolerance over 50% of pupils responded correctly (56.8% recorded for the NW and 66.3% for the SS zone), whereas less than 20% of students

responded correctly to the item on the permanence of alcohol in the body (14.3% recorded for the SW and 17.7% for NW zone).

At least 50% of the students from the NE and SW zones responded correctly to the item on marijuana dependence. The proportion of correct responses to the item investigating the consequences of marijuana consumption on sexual hormones production was lowest for the SW zone students (35.9%). The largest proportion of students who held high positive beliefs about tobacco, alcohol, marijuana and other drugs was recorded for the NW and NE zones. In all other zones, except for the NC, the proportion was less than 20%. Consistently, a large proportion of NW and NE zone students held low negative beliefs about tobacco, alcohol, marijuana and other drugs. More than 80% of students from all zones, except for the NW and the NE, perceived great risk in smoking more than one pack of cigarettes per day and drinking alcohol every day. A high proportion of NW students (11%) even stated there was no risk in smoking more than one pack of cigarettes per day, and 13.1% declared that there was no risk in drinking alcohol every day. More than 85% of students from all zones, except for NW and NE, perceived a great risk in smoking marijuana regularly. More than 50% of students from all zones, except for NW and NE, perceived a great risk in using other drugs occasionally. Between 11.7% and 26.5% of students did not know whether occasional drug use was risky.

High positive attitudes towards illegal drugs were recorded for 15.2% of students from the NW, 4.9% from the NE and 4.5% from the NC zone; the prevalence of positive attitudes towards drugs was lower in the other zones. Consistently, low negative attitudes were recorded for 14.7% of students from the NW, 7.6% from the NE and 5.2% from the NC zone. The prevalence was lower for all other zones.

Again, after controlling for age, sex and socio-economic status, inter-zonal differences in knowledge, beliefs and attitudes were confirmed (Table 3). A significantly lower proportion of NW zone students responded correctly to items on tobacco than the SW zone (reference) students.

A statistically significant higher proportion of NW and NE zone students held positive beliefs about tobacco, alcohol, marijuana and other drugs, whereas significantly lower positive beliefs on alcohol were recorded for SE than for SW zone students. High positive attitudes towards drugs were recorded four times more often among NW zone than among SW zone students.

Personal skills

High levels of self-esteem, as measured by the positive indicator, were recorded for the majority of students from all zones (Table 4). This proportion was slightly lower for the NW and NE zones. The proportion of students with a low positive self-esteem indicator was greater in NW than in the other zones. A middle level of the negative self-esteem indicator was recorded for more than 50% of students in most zones. The proportion of students with high negative self-esteem was greater in the NW and the NC than in the other zones.

A good level of the positive indicator of decision making skills was observed for the majority of students; the proportion of students with low positive decision making skills was greater in the Northern zones (NW, NE and NC) than in the other zones of the country. A greater number of students with a high level of the negative decision-making skills indicator was recorded only for the NW zone. In most zones, less than 5% of students stated they would accept tobacco and cannabis offered by friends, indicating good refusal skills. The proportion was higher for the NW, NE and NC zones. Over 12% of students of all zones stated they would accept the offer of alcohol: approximately 20% in NW zones. The proportion of students who stated they would accept cannabis was highest for the NW and NE zones (21.2% and 14.4%, respectively).

High communication skills scores were recorded for a similar proportion of students across all zones; however, a higher proportion of students with low communication skills was recorded for the NW zone.

Discussion

To our knowledge, this is the first study conducted in Nigeria to investigate knowledge, attitudes, risk perception and behaviours about the use of tobacco, alcohol, cannabis and other drugs among secondary schools' students from all geopolitical zones of the country.

Consistent with previous studies, comparison of behaviours between zones revealed a higher prevalence of lifetime and current cigarette smoking among NW zone students [18,30]. The prevalence was lower in the Southern zones than that reported by previous studies comparable for student age and survey year [17,30,31]. In line with the Global Youth Tobacco Survey (GYTS), our study recorded the highest prevalence of tobacco use among NW zone students [30]. Most previous studies involved students older than 15 years and generally reported a higher prevalence of smokers [9–11,13–16,22,23,26,28,32,33]. This corroborates the tendency of tobacco use to increase with age, as observed in our sample, and underscores the need to target prevention interventions to younger students. Overall, these figures confirm the lower prevalence of smoking recorded in Nigerian national statistics, as compared with the developed countries [3,34–37].

Cannabis use was higher for the NW, NE and NC zones: in the adult national population survey, the highest prevalence rates were recorded for the NE zone [34]. The prevalence in NC was consistent with a previous study conducted there [14]. In contrast, the prevalence of cannabis use in the NW zone was very high (21.2%) and more than twice higher than that previously observed in 2004 [20]. The prevalence was also higher than that observed in other Muslim countries with high cannabis trafficking [38]. These data suggest a worrying increase in experimentation with cannabis use among adolescents in this zone, where prevention interventions should be deployed accordingly.

The prevalence of the use of other illicit drugs was higher in the NW and NE zones: in the adult national population survey, the highest prevalence of heroin and methamphetamine use was recorded among NW zone males [34]. The prevalence of other drugs use we observed was quite high across all zones (5% in the SE to 26% in the NW), underlining also in this case a 'new' and alarming problem to be addressed with specific interventions. This rise is coherent with the increasing number of people entering treatment for opioid use disorders recently reported for Nigeria [39].

Social environment, information and psychological factors can explain the differential prevalence of substance use across the geopolitical zones. In our study, the use of tobacco and illicit substances was higher among Northern zone students. Consistently, higher intermediate factors scores correlated with the risk of substance use according to the literature were noted for the students from these zones: low self-esteem, bad decision-making skills, low refusal skills, low knowledge, risk perceptions and beliefs about the consequences of substance use. Moreover, far fewer Northern zone students stated that they would get into trouble with their parents if they smoked cigarettes, drank alcohol or used marijuana and other drugs than their Southern counterparts (data not shown). The Northern zones are the poorest in the country, are afflicted by unrest and conflict, and are influenced by Sharia law; and there is a well-known educational gap between the North and the South [3,40–42]. This circumstance influences general life and society and personal habits, and may result in poor school attendance, less information and lower parental monitoring, all factors that can explain our findings.

Alcohol was the most commonly used substance for all geopolitical zones. This was expected, since alcohol is the most widely used psychoactive substance also among adults in Nigeria [34,36]. Its use is common across all the cultural groups in the country, and it is consumed either in the form of traditional beverages or as western lager beer, wine or spirits [43]. In our study, the highest prevalence of adolescent lifetime alcohol use was recorded for the Southern zones and the lowest rate for the NE zone. This finding is consistent with Adamson0s adult national population survey, with studies conducted in the Southern zones and with a review by Dumbili [27,33,34]. The prevalence of alcohol use among adolescents in SW was higher than previously recorded [32].

When the prevalence of use of a legal substance is high in the general population, the behaviour is socially accepted, which can influence initiation of its use by adolescents. Moreover, the availability of alcohol and the influence of the media and advertisements have boosted alcohol consumption by adolescents in developing countries [44]. The lower prevalence of lifetime alcohol use in the Northern

zones could be due to the higher proportion of the Muslim population and the influence of Sharia there [36,41]. Contradicting this explanation, however, is the greater prevalence of recent alcohol use and drunkenness episodes we recorded among adolescents from Northern zones (and from Lagos) than from the other zones. This is somehow difficult to explain, but it could be due to the age of our students that is the age at which young people are prone to experiment and are more receptive to the influence of their peers and the youth culture than to society in general. Furthermore, adolescents are particular for their refusal of adult norms and values. Moreover, previous studies found no association between religious affiliation and substance use among adolescents [10,11,17,25]. Another explanation could be that education in the Southern zones is more traditional, and parents are more likely to monitor their children than those living in the disadvantaged areas of the North and in large urban contexts. It is also possible that on reaching adult age, their behaviours will ultimately conform to society0s norms, so that in the Northern zones the prevalence of alcohol use will result lower as compared with the Southern zones, consistent with Muslim precepts that strictly prohibit alcohol use. Overall, knowledge about the health consequences of substance use was quite low across all zones, and about one-third of students had low negative beliefs. This indicates a low level of information and health awareness. Moreover, a high proportion of students in some zones showed low self-esteem and decision making skills. These personal factors are important for adolescent development and for the adoption of risk behaviours and can be easily addressed through skill based prevention interventions [45]. It is important to implement these interventions, especially in those zones where the knowledge level was found to be low, and negative beliefs and skills were observed.

This study has some limitations. Since the survey was conducted in the school setting, its results cannot be generalised to all adolescents. The mean age differed across zones, and this could have biased the prevalence of substance use. All the information was self-reported, and this could have weakened the reliability of the responses; however, anonymous questionnaire administration should have attenuated this risk. NW zone was affected by a certain proportion of absenteeism; we cannot exclude selection bias of pupils in this zone. The disadvantage observed for pupils of this area could be underestimated.

On the other side, the present study has some strengths. It was conducted in all geopolitical zones of the country. The sample was large, and the sampling procedure was based on the population size of the zones, making it representative. The questionnaire was administered following a standardised procedure. Since it investigated information on behaviours, knowledge, beliefs, attitudes, risk perception and skills, it provided a comprehensive description of the substance use problem among adolescents in Nigeria.

Our study reports a low prevalence of cigarette smoking for most zones, except for the NW zone, which merits special attention by health and education professionals for initiating prevention activities. We observed an alarming situation of alcohol, cannabis and other drugs use, as well as low knowledge and risk perceptions and high positive beliefs. Interzonal differences will need to be taken into account when prioritizing actions by local governments. These contents are addressed in prevention curricula: the adoption of school-based interventions could help to overcome the problem. Efforts should be made to reduce the availability of alcohol to adolescents, given that the per capita consumption is amongst the highest in Africa. Widespread consumption makes alcohol a socially accepted substance and raises the risk of adolescents taking up alcohol use in the near future [27,46,47].

This study observed a high prevalence of alcohol and substance use among adolescents in Nigeria. Due to continuous urbanisation, prevalence rates could rise further unless intervention strategies are intensified [48]. Evidence-based drug education and prevention activities should be planned and implemented across the country as concern alcohol use. Special attention should be paid to the use of cannabis and other illicit drugs in the Northern zones. Prevention programs targeting adolescents could help to reduce the later burden of disease related to tobacco, alcohol and other drugs in adulthood.

Conflict of Interest

The authors have no conflicts of interest.

Author Contributions
FV-T designed and conceptualised the Unplugged Nigeria trial and the present study. PvdK and FV-T trained the data manager, trainers and teachers. HKV, AO, GP and IA devised the project, implemented the study and coordinated the field work. IA and JP collected the data. FV-T, MA and EM drafted the paper. LD and EM carried out the statistical analysis. All authors provided critical revision, contributed to and approved the final manuscript.

Data Accessibility Statement
The dataset for the analyses includes 4078 records of anonymous questionnaires completed by secondary school students in Nigeria in December 2015/January 2016; the data include information on sociodemographic characteristics (sex, age, family car and personal computers, family composition); school performance; substance use (tobacco, alcohol and drug use during lifetime and in the last 30 days); knowledge, beliefs, risk perception and attitudes towards drugs; self-esteem, decision making skills, refusal skills; perception of substance use by peers and friends; parental permissiveness towards use of tobacco and alcohol.
Data are available under request.
Federica Vigna-Taglianti is responsible for the data.

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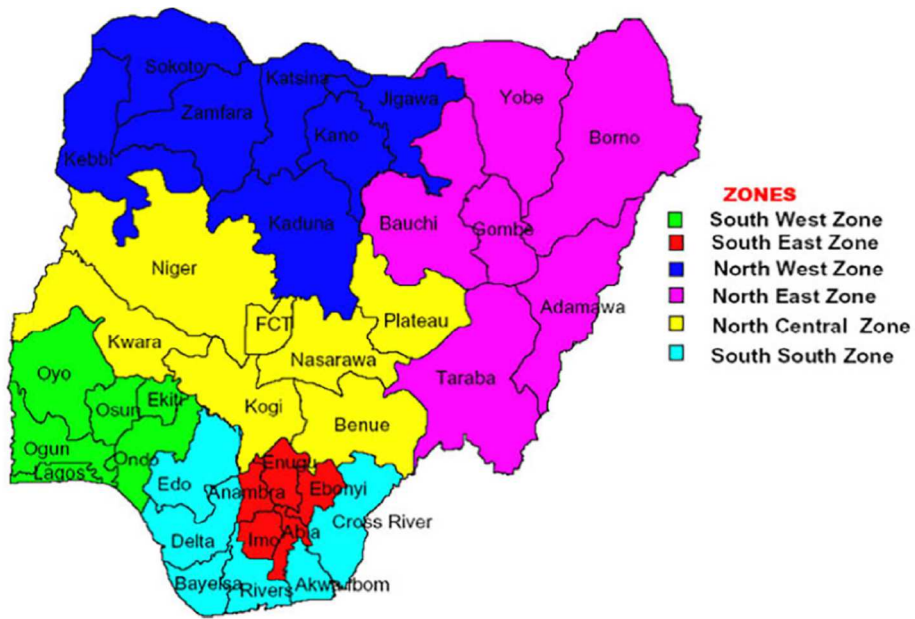
Figure 1. *Nigeria geo-political zones.*

Table 1. *General characteristics of students by zone*

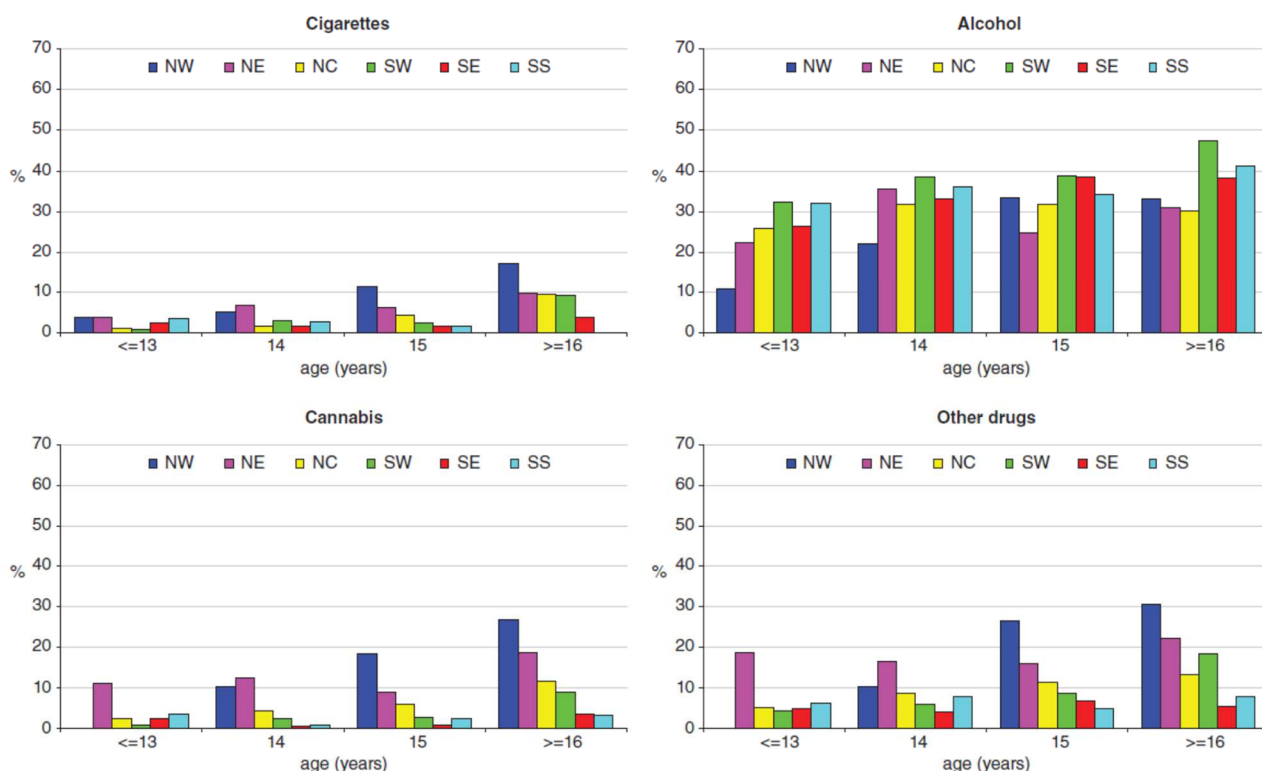|	North West (N = 665) %	North East (N = 509) %	North Central (N = 808) %	South West (N = 1003) %	South East (N = 564) %	South South (N = 529) %	Overall (N = 4078) %
Sex							
Male	79.4	62.9	65.8	65.2	66.0	56.7	66.4
Female	18.9	33.8	32.7	34.0	33.5	41.2	32.1
Age (years)							
10–11	0.0	0.2	0.1	0.2	0.2	0.4	0.2
12–13	4.2	5.1	14.2	24.1	7.3	21.0	13.8
14	8.9	20.4	34.8	51.7	45.0	42.9	35.4
15	35.2	28.7	29.6	18.5	37.8	23.8	28.0
16–17	42.9	38.3	19.3	5.4	9.6	11.2	19.7
18–20	8.9	7.3	2.0	0.1	0.2	0.8	2.9
Mean (±SD)	15.8 (±1.2)	15.5 (±1.3)	14.7 (±1.2)	14.0 (±0.9)	14.6 (±0.8)	14.3 (±1.1)	14.7 (±1.2)
Family composition							
Both parents	49.3	47.7	55.0	65.3	61.5	57.7	56.9
Only one parent	14.3	9.2	5.5	5.9	5.3	5.9	7.5
Other	33.7	41.8	38.5	28.5	32.6	35.9	34.5
Family care							
None	13.7	30.3	16.1	16.6	22.0	28.5	20.0
One	42.3	44.6	43.6	42.5	42.5	43.5	43.1
Two or more	42.1	24.0	38.6	40.3	34.6	27.6	35.8
Family computers							
None	18.6	27.7	20.8	13.5	20.2	24.2	19.9
One	26.0	32.6	26.7	25.1	29.8	35.3	28.5
Two	22.7	18.3	20.3	18.4	18.4	15.3	19.1
More than two	29.0	19.4	31.2	42.6	31.0	24.6	31.3
School performance (academic grades)							
Good	48.0	51.3	42.1	46.6	57.9	57.8	49.5
Medium	36.7	42.4	51.1	50.0	38.3	38.6	44.0
Bad	10.2	4.5	4.5	3.0	2.8	1.3	4.4

Figure 2. *Lifetime prevalence of cigarettes, alcohol, cannabis and other drugs use by age and zone.*

Table 2. *Knowledge, beliefs, attitudes and risk perception on tobacco, alcohol, marijuana and other drugs by zone*

	North West (N = 665) %	North East (N = 509) %	North Central (N = 808) %	South West (N = 1003) %	South East (N = 564) %	South South (N = 529) %	Overall (N = 4078) %
Knowledge on tobacco							
Nicotine is the substance in cigarettes that causes lung cancer							
Yes	63.4	57.6	54.1	62.5	60.4	62.2	60.1
No (correct)	6.9	4.1	3.3	4.1	2.9	2.7	4.0
Do not know	29.7	38.3	42.6	33.4	36.7	35.1	35.9
One needs to smoke several cigarettes/day to become addicted							
Yes	53.1	38.9	36.9	38.3	36.8	34.7	39.8
No (correct)	27.6	40.9	47.2	46.2	50.5	50.9	44.0
Do not know	19.3	20.2	15.9	15.5	12.7	14.5	16.3
Knowledge on alcohol							
Women have lower tolerance to alcohol than men							
Yes (correct)	56.8	64.1	63.0	61.9	58.5	66.3	61.7
No	20.8	20.1	16.1	14.4	20.7	16.2	17.6
Do not know	22.4	15.8	21.0	23.7	20.7	17.4	20.7
It takes about 30 min to eliminate from the body the alcohol contained in a can of strong beer							
Yes	40.0	36.5	32.7	30.2	34.2	41.2	35.1
No (correct)	17.7	14.8	15.0	14.3	14.6	16.8	15.4
Do not know	42.2	48.7	52.3	55.4	51.2	42.0	49.5
Knowledge on marijuana							
Smoking marijuana does not cause physical dependence							
Yes	27.7	14.4	17.8	17.5	22.9	22.8	20.3
No (correct)	44.2	54.0	48.7	50.5	47.4	47.4	48.7
Do not know	28.0	31.6	33.5	32.0	29.7	29.7	31.0
High consumption of marijuana decreases sexual hormones							
Yes (correct)	44.3	43.0	36.7	35.9	43.8	44.7	40.5
No	18.0	14.7	15.9	12.4	14.1	16.2	15.0
Do not know	37.7	42.4	47.4	51.7	42.2	39.1	44.5
Beliefs on tobacco							
Positive beliefs							
Low	35.8	39.7	55.8	61.5	70.2	64.3	55.1
Middle	28.0	27.7	24.2	23.2	16.9	19.4	23.3
High	36.2	32.6	20.0	15.4	12.9	16.3	21.6
Negative beliefs							
High	40.5	33.2	51.0	57.8	55.6	53.4	49.7
Middle	15.4	19.9	17.8	24.6	20.5	15.1	19.4
Low	44.2	46.9	31.2	17.6	23.9	31.5	30.9
Risk perception: smoke one or more packs of cigarettes per day							
No risk	11.1	3.5	2.6	1.2	0.9	0.8	3.3
Slight risk	13.2	11.4	7.6	10.1	7.4	9.8	9.9
Great risk	53.8	75.0	82.4	84.7	88.1	85.1	78.5
Do not know	16.1	7.5	5.6	2.6	2.8	3.6	6.1
Beliefs on alcohol							
Positive beliefs							
Low	38.6	44.4	53.1	58.1	66.6	63.2	54.2
Middle	27.6	27.5	26.4	24.4	20.0	18.3	24.3
High	33.8	28.1	20.5	17.5	13.4	18.5	21.5
Negative beliefs							
High	42.2	37.4	50.9	55.0	53.9	48.9	49.0
Middle	16.0	18.7	20.0	26.1	22.3	18.5	20.8
Low	41.8	43.9	29.1	18.9	23.8	32.5	30.2
Risk perception: drink alcohol every day							
No risk	13.1	5.1	3.0	1.4	0.2	2.8	4.1
Slight risk	12.2	10.2	9.4	11.1	13.3	9.8	11.0
Great risk	54.3	75.0	80.3	84.2	83.3	84.7	77.3
Do not know	15.3	6.9	5.6	1.9	2.7	1.7	5.5
Beliefs on marijuana and other drugs							
Positive beliefs							
Low	39.3	45.0	57.8	60.6	67.3	65.2	56.3
Middle	27.3	26.7	22.0	23.5	16.9	16.1	22.3
High	33.3	28.3	20.2	15.9	15.8	18.7	21.4
Negative beliefs							
High	43.4	40.6	60.6	72.7	65.7	59.8	58.9
Middle	13.9	16.7	11.5	12.5	13.1	10.1	12.8
Low	42.7	42.7	27.9	14.8	21.2	30.1	28.2
Risk perception: smoke marijuana regularly							
No risk	12.0	5.1	2.0	1.1	0.9	1.1	3.5
Slight risk	13.4	5.1	3.3	1.5	1.6	2.3	4.4
Great risk	50.8	76.0	87.3	93.6	94.3	91.7	83.0
Do not know	17.3	9.8	5.6	2.5	2.7	3.6	6.6
Risk perception: use other drugs occasionally							
No risk	17.0	9.6	3.8	5.4	4.1	5.1	7.3
Slight risk	15.6	21.8	22.2	28.2	28.7	23.2	23.6
Great risk	35.6	48.1	55.1	51.9	54.4	56.7	50.4
Do not know	26.5	17.1	17.2	13.2	11.7	14.2	16.5
Attitudes towards illegal drugs							
Positive indicator							
Low	55.9	67.8	76.6	79.8	84.4	76.2	74.1
Middle	28.9	27.3	18.9	16.5	12.5	20.3	20.2
High	15.2	4.9	4.5	3.7	3.0	3.5	5.7
Negative indicator							
High	47.8	58.0	65.7	69.1	79.7	69.2	65.1
Middle	37.5	34.4	29.1	28.4	18.3	27.4	29.2
Low	14.7	7.6	5.2	2.5	2.0	3.5	5.7

Table 3. *Adjusted Odds Ratios (OR) of substance use behaviours, knowledge, beliefs and attitudes towards illegal drugs in students of other zones versus south west zone*[a]

	North West OR (95% CI)	North East OR (95% CI)	North Central OR (95% CI)	South West -reference-	South East OR (95% CI)	South South OR (95% CI)
Cigarette use						
Lifetime	3.37 (2.03–5.61)	2.33 (1.33–4.08)	1.15 (0.66–2.01)	1.00	0.60 (0.29–1.26)	0.73 (0.35–1.54)
Last 30 days	4.87 (2.26–10.5)	2.65 (1.13–6.19)	0.62 (0.22–1.74)	1.00	0.31 (0.07–1.44)	0.37 (0.08–1.71)
Alcohol use						
Lifetime	0.60 (0.48–0.77)	0.68 (0.53–0.88)	0.70 (0.57–0.86)	1.00	0.89 (0.71–1.11)	0.96 (0.76–1.20)
Last 30 days	1.33 (0.95–1.86)	1.28 (0.89–1.84)	1.15 (0.85–1.57)	1.00	1.18 (0.85–1.66)	1.09 (0.76–1.55)
Cannabis use						
Lifetime	5.09 (3.12–8.29)	3.77 (2.24–6.33)	1.73 (1.03–2.91)	1.00	0.31 (0.12–0.81)	0.66 (0.30–1.43)
Last 30 days	5.78 (2.28–14.6)	3.38 (1.23–9.26)	2.26 (0.85–5.98)	1.00	0.51 (0.10–2.54)	0.31 (0.04–2.58)
Other drugs use						
Lifetime	2.92 (2.06–4.12)	2.21 (1.52–3.21)	1.23 (0.86–1.76)	1.00	0.61 (0.38–0.98)	0.86 (0.55–1.35)
Last 30 days	2.93 (1.68–5.13)	1.88 (1.02–3.49)	1.06 (0.58–1.93)	1.00	0.62 (0.28–1.35)	0.62 (0.27–1.40)
Knowledge						
On tobacco	0.47 (0.37–0.60)	0.85 (0.67–1.08)	0.98 (0.80–1.18)	1.00	1.14 (0.92–1.40)	1.16 (0.94–1.44)
On alcohol	0.84 (0.66–1.06)	1.05 (0.82–1.36)	1.05 (0.86–1.29)	1.00	0.93 (0.74–1.16)	1.24 (0.98–1.58)
On marijuana	0.97 (0.77–1.23)	1.18 (0.92–1.52)	1.00 (0.81–1.22)	1.00	1.17 (0.94–1.47)	1.05 (0.84–1.32)
Positive beliefs						
On tobacco	2.61 (1.98–3.43)	2.39 (1.79–3.18)	1.28 (0.99–1.66)	1.00	0.78 (0.57–1.06)	1.02 (0.76–1.39)
On alcohol	2.04 (1.56–2.67)	1.65 (1.24–2.21)	1.16 (0.90–1.49)	1.00	0.68 (0.50–0.93)	1.04 (0.78–1.39)
On marijuana/other drugs	2.04 (1.55–2.69)	1.73 (1.29–2.31)	1.21 (0.94–1.57)	1.00	0.90 (0.67–1.21)	1.18 (0.88–1.57)
Positive attitudes towards illegal drugs	4.51 (2.86–7.11)	1.34 (0.76–2.36)	1.16 (0.71–1.90)	1.00	0.82 (0.45–1.48)	0.91 (0.50–1.64)

[a]Adjusted for age, sex and socio socio-economic status (measured through family car possession). OR, odds ratios.