**RESPOSTA AOS COMENTÁRIOS DO REVISOR B**

**NOTA DO EDITOR, do Revisor B**

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**RESPOSTA à Nota do EDITOR RELATIVA AO Revisor B**

Os autores informam que responderam a cada comentário do Revisor B, no próprio documento do AO, agora sem track changes.

**COMENTÁRIO 1, Revisor B**

I strongly recommend a thorough review by an English native speaker.

**RESPOSTA 1, COMENTÁRIO 1, Revisor B**

Os autores informam que responderam ao Editor Chefe e Coordenação Editorial, enviando o certificado da empresa que validou o texto, devidamente certificada pela FCT.

**ABAIXO O ARTIGO – COM OS COMENTÁRIOS – APENAS DO REVISOR B – com RESPOSTAS PARA O REVISOR B.**

**Título:** Consumo de álcool e drogas na população escolar de São Tomé e Príncipe

**Title:** Consumption of alcohol and drugs in the school population of Sao Tome and Principe

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Não existe conflito de interesses

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**Cabeçalho PT:** **ÁLCOOL e DROGAS em SÃO TOMÉ e PRÍNCIPE**

**Header ENG: ALCOHOL and DRUGS in SAO TOME and PRINCIPE**

**Título:** Consumo de álcool e drogas na população escolar em São Tomé e Príncipe

**RESUMO**

**Introdução:** Em São Tomé e Príncipe não há estudos sobre o uso de álcool e drogas na população escolar, potencial aliada em intervenções preventivas. Os **objetivos** do presente estudo são 1) determinar a frequência do consumo de álcool e drogas na população escolar e 2) identificar as principais características associadas a estes comportamentos.

**Materiais e Métodos:** Foi aplicado um questionário biográfico, demográfico e socioeconómico sobre o uso de substâncias lícitas e ilícitas para uma amostra de 2064 alunos. As características demográficas e sociais apresentadas baseiam-se nas frequências observadas e as comparações entre os grupos foram feitas usando testes de qui-quadrado. A significância foi avaliada em =0.05.

**Resultados:** Mais da metade dos alunos consumiram álcool pelo menos uma vez na vida e 32% nos últimos 30 dias. Os alunos mais velhos mostraram-se mais propensos a consumir álcool (p <0,0001), mas mesmo nos alunos com idade inferior a 16 anos, 17% consumiram nos últimos 30 dias. Constatou-se também que entre todos os alunos, 7% consumiram uma ou mais vezes por semana nos últimos 30 dias. As razões apresentadas para o consumo frequente foram diferentes para os rapazes (“participação no grupo de amigos”) e raparigas (“diminuição da ansiedade”) (p = 0,005). Menos de 1% dos entrevistados admitiram ter usado maconha, cocaína, crack ou ecstasy.

**Discussão:** Apesar de algumas limitações, como o auto reporte, publica-se um primeiro diagnóstico de situação mostrando um elevado consumo de álcool pelos jovens e ainda a utilização de drogas ilegais nas escolas.

**Conclusão:** Estes resultados levam a concluir que é urgente o desenvolvimento de intervenções preventivas, nomeadamente, no âmbito da comunicação em saúde pública.

**Palavras-Chave:** Países africanos, álcool, droga, escolas, estudantes.

**Title:** Consumption of alcohol and drugs in the school population of Sao Tome and Principe

**ABSTRACT**

**Introduction:** In São Tomé and Príncipe there are no studies on alcohol and drug use among students, who could be potential allies in preventive interventions. The **objectives** of the present study are 1) to determine the frequency of alcohol and drug consumption in the school population, and 2) to identify the main characteristics of this behaviour.

**Materials and Methods**: We applied a biographical, demographic and socio-economic questionnaire on the use of licit and illicit substances to a sample of 2064 students. Demographic and social characteristics are presented based on observed frequencies and comparisons between groups were made using chi-square tests. Significance was assessed at =0.05.

**Results**: More than half of the students consumed alcohol, at least once, in their lifetime and 32% consumed in the last 30 days. Older students were more likely to consume alcohol (p <0.0001), but even in students under 16 years, 17% consumed in the last 30 days. We also found that 7% consumed one or more times per week in the last 30 days. The reasons presented for frequent consumption were different for boys (“participation in their group of friends”) and girls (“decrease anxiety”) (p = 0.005). Less than 1% of respondents admitted to having used marijuana, cocaine, crack or ecstasy.

**Discussion:** In spite of some limitations, such as self-reporting, we provide a first picture showing high consumption of alcohol by young people and the existence of illegal drugs circulating in the schools.

**Conclusion:** These results lead us to conclude that it is urgent to implement public health communication preventive interventions.

**Keywords:** African countries, alcohol, drug, school, students.

**No Conflict of Interests**

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**Introduction**

African Countries (AC), are mostly, low-and middle income countries (LMIC), where extreme poverty1,2 causes considerable health inequalities3,4. Sao Tome and Principe (STP), the smallest of them, presents a socio-epidemiological reality5 characterized by the almost absence of healthy lifestyles6,7, formal education and health communication policy7–10. There is wide consumption of alcohol and drugs (A&D), but no systematic research has been done, only overall statistics are available based on the importation of alcoholic drinks and their distribution among the population8,9,11. In fact, the World Health Organization (WHO) “Global Status Report on noncommunicable diseases 2014” is the only survey12 in Africa dealing with A&D consumption and its harmful use, but it presents only aggregated data.

According to the WHO, globally, alcohol use results in 3.3 million deaths7. Heavy consumption of alcohol, an oncogenic substance, is believed to be a risk factor for cancer13–15 (also in STP16), due to more than a hundred medical reasons, as well as a risk for other non-communicable diseases (NCD)717, such as mental and behavioral disorders and it is also responsible for injuries, traffic accidents 6,18–20 and deaths21,22. Thus, the situation constitutes a serious threat to public health3. It is difficult to judge the level of alcohol intake, because the scientific community is often unaware of all types of artisanal alcohol (outside the commercial circuit) produced in STP23 (without regulatory legislation and no sanitary control) and consumed by local communities24,25. For example, in STP, the most common forms of alcohol are “*cacharamba*”, *“chalelinha” and “tomatxo”*, a distilled drink (sugarcane, mango, cajamanga fruit and pineapple), and palm wine produced locally. The WHO reports, in 2014 estimates, that this unrecorded consumption for people older than 15 years11 in STP is 2.9 litres per capita of the total 7.1 litres per capita estimated for 2008-2010. They also estimate much heavier drinking in males (11.5 litres per capita) then in females (2.9 litres per capita)11,19. WHO also estimates that more females (72.6%) than males (50.6%) are abstainers in the last 12 months26. However, there is no data specific to young people27,28 (school population) or on the effects of alcohol on NCD28–30 or deaths in STP7,19,21.

Young people are vulnerable6,25,26 to developing habits of harmful alcohol consumption27,31–33, with important life-time implications for their health. The risk of future addiction is very high if “binge” drinking begins at 15 years. In addition, some preventive interventions (Health promotion and risk reduction)34 to reduce alcohol35–38 and drugs27,37 consumption, such as health communication35,39–42, are recommended for younger populations43, as a health priority44,45. As a base to develop intervention priorities, the present study analyzed the frequency and distribution of alcohol and drug consumption in the public-school population, and identified and characterized the profile of consumers46–48.

**Materials & Methods**

**National survey**

We conducted a cross sectional, observational study with a questionnaire-based survey of the student population (public schools and university) of STP between September 2013 and May 2014. We interviewed a sample of students from three settings: grades 8 to 12 in public secondary education; public university and night school; and professional and qualification training. We emphasize that typically these levels of schooling include students aged 12-18; 18-25; and older respectively. The anonymous questionnaire included biographic, demographic and socio-economic26,49 questions, as well as questions about the use of licit and illicit substances37. The survey instrument was developed specifically for this study, in Portuguese language adapted to the local dialect *forro.* The questionnaire was first validated based on a pilot survey of a convenience sample of 150 male and female students, including analyses of comprehension of the questions and translation. This questionnaire is included in the appendix. For the main study, from the total population of 16924 students in public schools and the Instituto Superior Politécnico, now part of the University of Sao Tome and Principe, we obtained a sample of 2064 individuals (12% of the total). This sample included students from all public schools of Sao Tome and Principe, and each school was sampled proportionally to its student population size. This sampling was done in coordination with the school’s Principal and for each school, random classes, with approximately equal numbers of boys and girls, were chosen to answer the questionnaire, so in each school we sampled classes not students for logistical reasons. The students from the classes selected were instructed about the objectives of the research, the anonymity of the questionnaire and that they were not under obligation to answer it or any of the questions. Thus, filling the anonymous questionnaire corresponded to informed consent. A sample with this size has associated a maximum error of estimation for the proportions analyzed of 2%, for a confidence level of 95% [cite: Ryan, Thomas P. “Sample Size Determination and Power” Wiley. New Jersey, USA \_(2013), chapter 2].

Approval by all relevant authorities of STP including the Ministry of Educação, Cultura e Formação and the Directorate of Ensino Secundário (Secondary Education) was obtained before application of the questionnaire. In addition, the study was approved by the Ethics Committee of Centro Hospitalar de Lisboa Norte, Faculdade de Medicina da Universidade de Lisboa and Centro Académico de Medicina de Lisboa (Reference number 47/16).

**Statistical analyses**

We present the results of descriptive statistical analyses of the data, and comparisons between groups that were done using chi-square test or Fisher exact test, if necessary. Since answering each question was optional, some of the variables may not have data for the full 2064 participants. In each figure, we present the number of respondents for the specific question being analysed. The analyses were done using IBM SPSS, 24 version. We considered a significance level of =0.05.

**(Insert figure 1)**

**Results**

**Overall alcohol consumption habits**

This study analysed the sociodemographic characteristics of the alcohol and drug consumption habits of the school-aged population of the islands of STP. From the total 2064 individuals surveyed 52% were male and 48% were female. The age limits were 12 - 30, median 18-years old. We sampled students from all public schools in Sao Tome and Principe, including all districts (Figure 1). The students were attending secondary school (56%, median age=17, interquartile range= 3); night school & illiteracy classes (30%, m=21, IQR=8); technical education (9%, m=21, IQR=4); and higher education (5%, m=22, IQR=5).

**(insert figure 2)**

Half of the students admitted having consumed alcohol at least once in their lifetime (Figure 2), 29% consumed alcohol over the previous 30 days, with 22% stating that they consumed less than once a week and 7% once or more times per week (Figure 3). In addition, a proportion of 23% acknowledged that they have friends who get drunk on a weekly basis, and of these, 1/3 say that many or all of their friends do get drunk. These numbers may be an underestimate, since they are based on self-reporting and between 7% and 12% of students refused to answer some of these questions. (Figure 2 and Figure 4).

**(Insert figure 3)**

**Demographic characterization of alcohol consumption**

Next, we analysed the demographic characteristics of alcohol consumption among the student population. Overall, male students are more prone to drinking alcohol than female students, with 58% vs. 43%, respectively, saying that they did at least once in the past (Figure 4). This difference was statistically significant (2=42.55, p= 7×10-11). The female students also drink less frequently, with 25% stating that they consumed over the last 30 days, in comparison to 38% of male students doing so. However, if we focus only on these students, who did consume over the last 30 days, the frequency (<1/week vs. ≥1/week) of consumption does not reach statistical difference between males and females (27% vs. 20% consume ≥1/week, respectively, 2=3.26, p=0.071).

**(Insert figure 4)**

There was a very strong association between alcohol consumption and age (2=176.96, p= 2.4×10-36), with higher percentages of older students having tried alcohol before (we stratified age as in Figure 4). This is perhaps expected due to a cumulative effect of “having tried alcohol before”. But even in the two younger age groups (<14 years and 15-16), about 35% indicate that they have consumed alcohol before, and 17% consumed over the last 30 days. Even though 69% of students older than 25 had consumed alcohol before, this was less than the 20-25 age group (74%), but this difference is not significant (2=1.68, p=0.19). When we analysed only those who stated they had drunk alcohol in the last 30 days, perhaps regular drinkers, there was no association between age and drinking level (<1/week or ≥1/week) (2=10.46, p=0.063). For example, for the ages between 15 and 25, about 20% to 27% of those who drank in the last 30 days, did so frequently (≥1/week) (Figure 4).

We also analysed the geographical disparities in alcohol consumption in STP (Figures 1 and 4). We were especially interested to see any differences due to income levels in the different districts. However, we found that the highest consumptions were in Água Grande and Lembá, which are the richest and poorest districts of STP, respectively. In these districts, 56% and 57%, respectively, of students refer drinking alcohol at least once before.

**Social characterization of alcohol consumption**

Students attending night school and literacy classes (57%), technical training (76%) and higher education (79%) present a higher percentage of having consumed alcohol before than students in regular day time high school (40%) (Figure 4). However, this may be related to the older age of students in those educational contexts, indeed the median age of students in regular high school is 17 vs. 21 in the other three types of educational setting. As expected, the frequency of drinking is also different with 5% of students in daytime secondary school affirming that they consumed more than once a week in the last 30 days, versus 11.3% for the students in the other educational settings. The mother’s education level does not seem to influence past alcohol consumption: 49% of students with mothers lacking formal education have consumed in the past, compared with 52% of the children of mothers with the secondary cycle incomplete and 45% for the case of completed higher education (2=4.79, p=0.091) (Figure 3). The mother’s education level was also not associated with the frequency of drinking (2=6.49, p=0.165, using three categories of drinking frequency none, <1/week and ≥1/week). On the other hand, the actual alcohol/drug consumption habits of mother or father were associated with student drinking, with more of them having tried alcohol at least once if their mother or father are regular users (2=19.81, p=9×10-6 and 2=13.79, p=0.0002, respectively). Interestingly, this association does not affect students who drink regularly or heavily (more than once a week in the last 30 days), since about 7%-9% report this behaviour, independently of whether their father or mother drink regularly or not. The biggest difference is that substantially more students report drinking occasionally (less than once a week over the last 30 days), if their mother or father also consume.

When asked why they consume alcohol frequently, the 109 students, who admitted to that (and also answered this question), chose as the main reason “to participate in their peer group” (52%), “to break routine or enjoy the effects” (19%), “to relieve anxiety or stress” (26%), and “to relief abstinence symptoms” (3%). But these percentages were very different for males and females (p=0.005 by generalized Fisher test), with the former choosing the first reason 58% of the time vs. 37% for girls, whereas females chose “relieving anxiety” 50% vs. 17% for boys.

**Illicit drug consumption habits**

We also asked about consumption ofillicit drugs, but very small numbers of students admitted to this, with 1% or less having tried marijuana, cocaine, crack and/or ecstasy before (Figure 2). These small numbers do not allow us to characterize this behaviour in any more detail.

**Discussion**

Alcohol and drug consumption in the Republic of Sao Tome and Principe11,26,50 is a potential serious threat to public health51,52, with high losses of lives and DALY5,17 and without appropriate preventive interventions53,54, such as legislation or public health communication preventive policies39,55. The Government acknowledges the problem of excessive alcohol consumption, but no legislation has yet regulated artisanal alcohols24,25, produced in the community and sold freely to everyone, including young children. The situation is even worse due to lack of social and health education25,56 and communication policies57 empowering students38,58 and youth in general for preventive behaviours59,60.

In this study, we provide a first picture of the habits of alcohol and drug consumption in the school population. We found high levels of experience with alcohol, and a worrying percentage of regular drinkers19,25 (~30%). There were differences between males and females, and among age groups, in their lifetime consumption habits. However, an interesting result is that when we focused only on those students who consumed in the last 30 days, differences by sex and age were much less evident. This may indicate that there is a group of regular consumers, who have socio-demographic characteristics different from the overall student population. Such a possibility should be taken into account when defining intervention strategies28,33. The issue of a potential group of “regular consumers” is reinforced by our findings that heavy drinkers28 among the student population61 were not associated with the consumption habits of the parents, although general consumption habits of students (for example, being “occasional drinkers”) were associated with parents’ consumption behaviour. Overall, we found low levels of admission of illicit drug consumption, but this study did confirm the existence of these drugs circulating within the school settings.

Although we collected a wealth of previously inexistent information, there are limitations to our study. The most important is that this is a voluntary self-assessment survey, since the students answered the questionnaire by themselves (albeit during class time). This could also mean that different students may have understood some questions differently. We tried to minimize these issues by explaining the questionnaire before40,62 students started answering it and assuring them of anonymity. Moreover, questions that could be subjective, like amount of drinking, were framed with specified frequency ranges (see questionnaire in Appendix). However, we did not include an actual measure of quantity drunk (e.g., one cup or 150 ml), because this would be of difficult interpretation. Other context dependent issues that must be taken into account refer to questions about the drinking habits of family members. In STP, non-traditional family units are common, for example men can have more than one wife (polygamy).

In this study, we targeted the school population, because we believe they are a primary target for future health communication preventive intervention campaigns, but we acknowledge that there may be many young people not attending school. This population may be qualitatively different from the one surveyed in the study, and so we can’t extrapolate our findings to all the youth of STP.

**Conclusion**

In spite of the aforementioned limitations, to our knowledge a study of this kind was never done in Portuguese-speaking African Countries, and so we provide a valuable assessment for STP. Clearly, there is a great need for further epidemiological research in developing African countries.

Altogether, we conclude that the prevalence of alcohol consumption identified among the young school population is high, with alarming rates of regular drinkers, but admission of drug consumption is relatively low. Still, together, alcohol and drugs constitute a potential serious threat for public health in São Tomé and Principe.

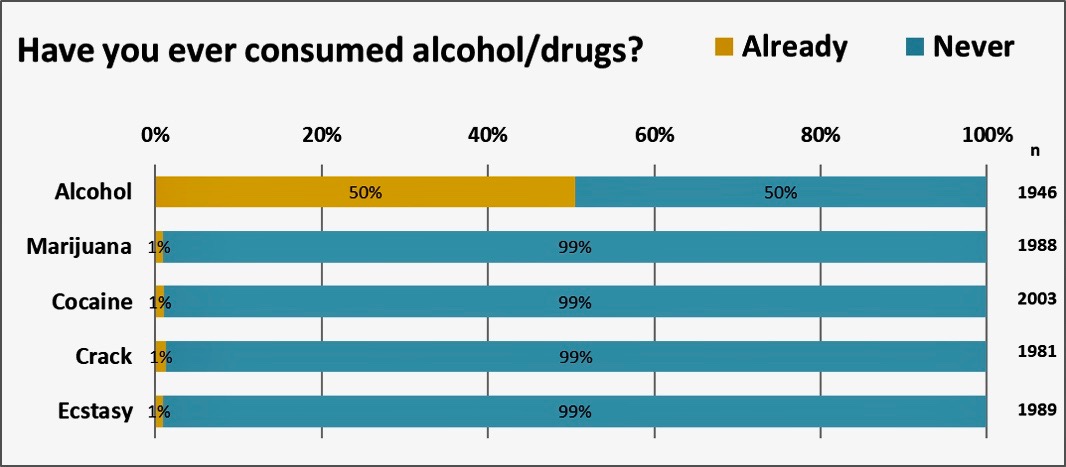
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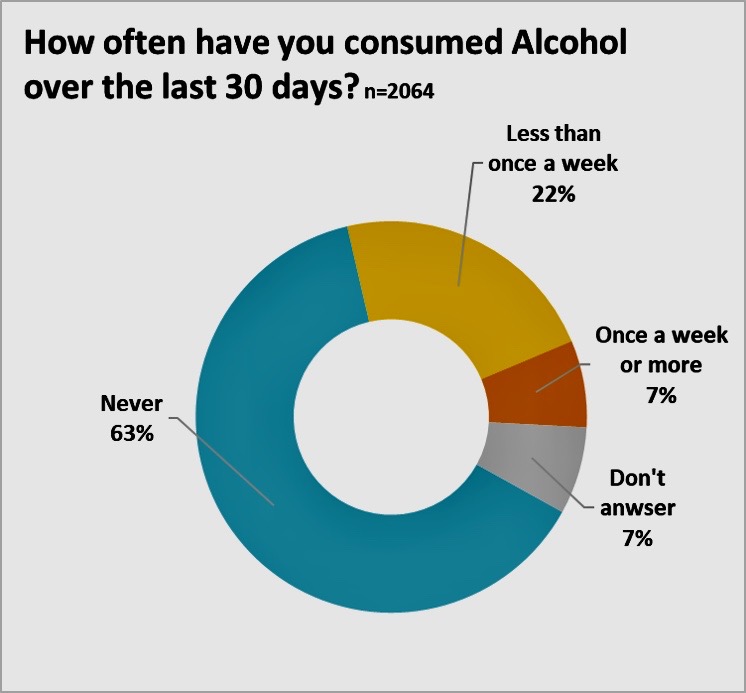
**Figure 1. Map of Sao Tome and Principe, highlighted on the African Coast, Gulf of Guinea, to allow identification of the districts included in the present study.**



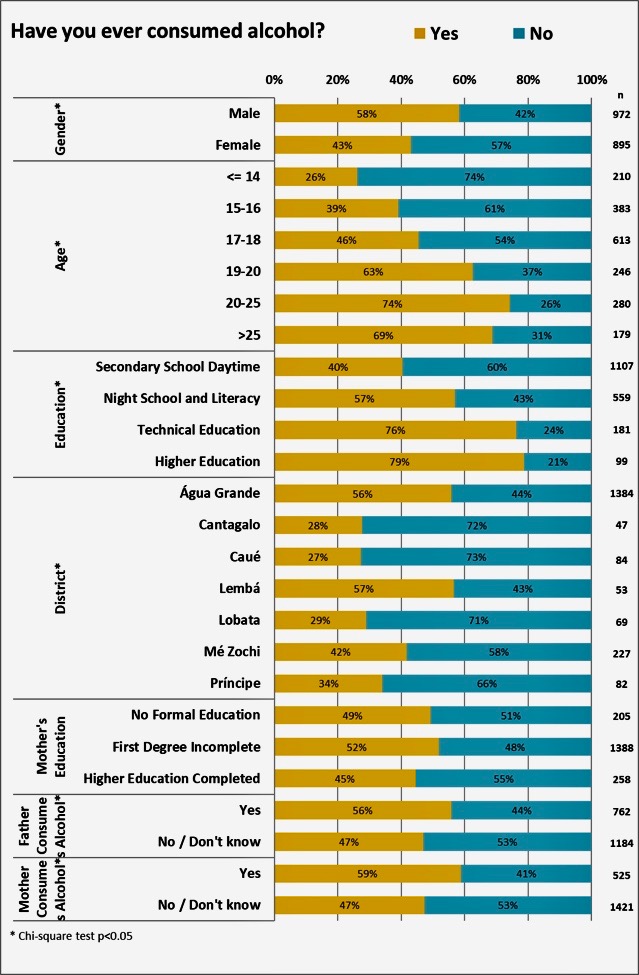
**Figure 2. Percentage of students who have ever consumed alcohol or drugs.**



**Figure 3. Alcohol consumption in the last 30 days**



**Figure 4. Characterization of alcohol consumption habits by demographic and social factors**



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**Figures Captions**

**Figure 1.** Percentage of respondents admitting to having ever tried alcohol or illicit drugs.

**Figure 2.** Frequency of drinking in the last 30 days

**Figure 3.** Map of Sao Tome and Principe, highlighted on the African Coast, Gulf of Guinea, to allow identification of the provinces included in the present study (see Figure 4).

**Figure 4.** Determinants of alcohol consumption among the school population in São Tomé e Príncipe.

**Frequency of drinking in the last 30 days**

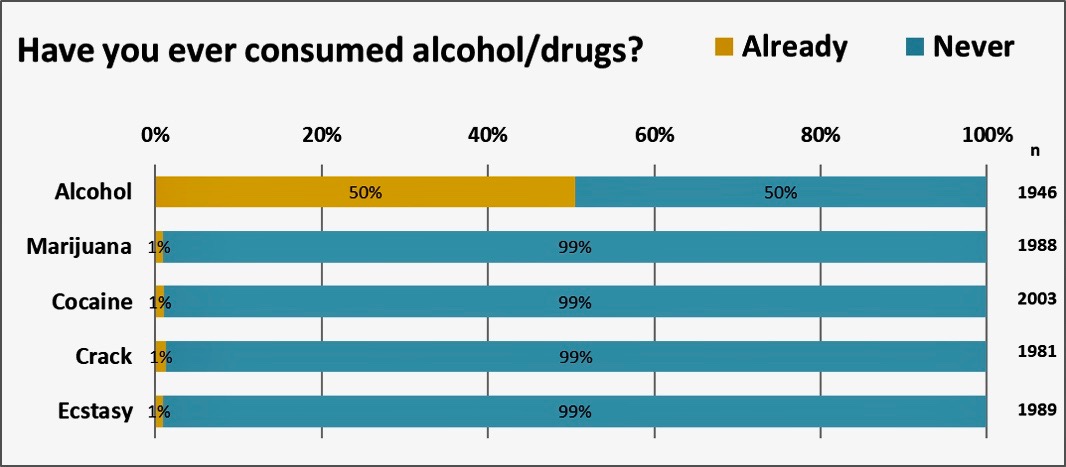


Figure 1

**Alcohol consumption in the last 30 days**

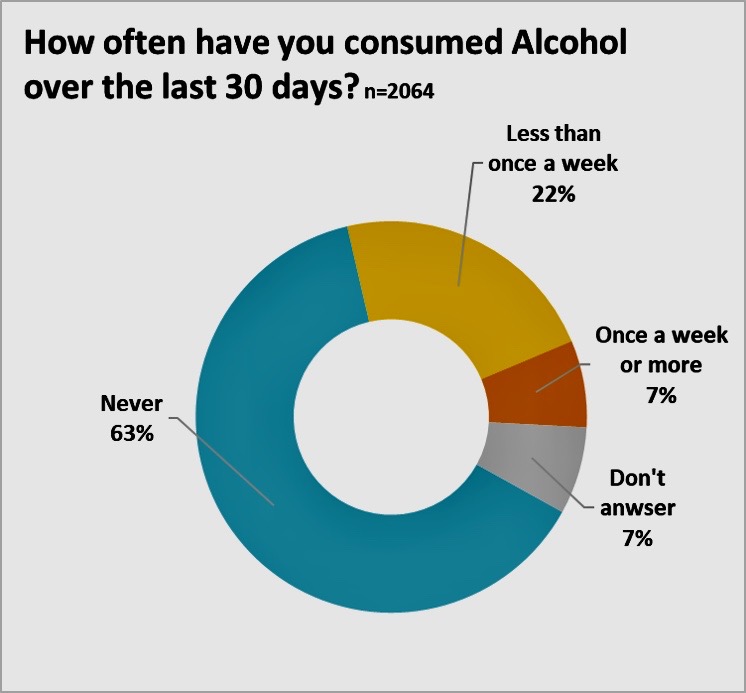


Figure 2

**Map of Sao Tome and Principe, highlighted on the African Coast, Gulf of Guinea, to allow identification of the provinces included in the present study (see Figure 4)**



Figure 3

**Percentage of respondents admitting to having ever tried alcohol or illicit drugs**

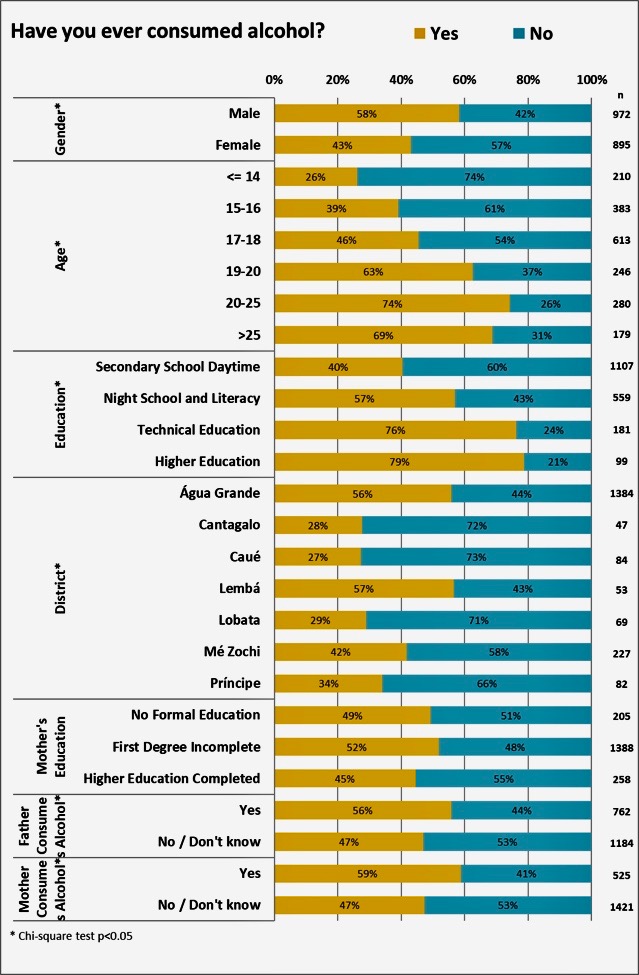


Figure 4

**Tables Captions**

**Table 1.** Chi square: Have you ever consumed alcohol?

Have you ever consumed alcohol?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Factor** |  | **YES** | **NO** | **p-value** |
| Gender | Male | 566 | 406 | 7×10-11 |
| Female | 385 | 510 |
| Age | <=14 | 55 | 155 | 2×10-36 |
| 15-16 | 150 | 233 |
| 17-18 | 279 | 334 |
| 19-20 | 154 | 92 |
| 20-25 | 208 | 72 |
| >25 | 123 | 56 |
| Education | Secondary school daytime | 448 | 659 | 1×10-28 |
| Night school and literacy | 318 | 241 |
| Technical education | 138 | 43 |
| Higher education | 78 | 21 |
| District | Água Grande | 773 | 611 | 1×10-13 |
| Cantagalo | 13 | 34 |
| Caué | 23 | 61 |
| Lembá | 30 | 23 |
| Lobata | 20 | 49 |
| Mé Zochi | 95 | 132 |
| Príncipe | 28 | 54 |
| Mother’s education | No formal education | 101 | 104 | 0.091 |
| First degree incomplete | 720 | 668 |
| Higher education completed | 115 | 143 |
| Father consumes | Yes | 425 | 337 | 0.0002 |
| No / Don’t know | 557 | 627 |
| Mother consumes | Yes | 309 | 216 | 9×10-6 |
| No / Don’t know | 673 | 748 |

**Table 1.**