Tobacco use among School-going Adolescents in Comoros: A Secondary Analysis of the 2015 Comoros Global Youth Tobacco Survey.

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Abstract

Background

Tobacco use among adolescents has long term adverse health consequences, especially during adulthood. Currently, little is known about tobacco use behaviour among adolescents in Comoros. Our study aims to estimate the prevalence and identify key factors associated with tobacco use among adolescents in Comoros using the 2015 Comoros Global Youth Tobacco Survey data.

Methods

National cross-sectional survey data of 2,810 eligible school-going adolescents aged between 11-17 years were analysed. Complex sample logistic regression analyses to determine the correlates of current cigarette smoking and current use of non-cigarette tobacco products.

Results

The overall prevalence of current cigarette smoking was 14.3% [males (18.5%), females (9.9%)]. The prevalence of current use of non-cigarette tobacco products was 5.8% [males (6.7%), females (4.9%)]. Being male (AOR=2.23;95%CI:1.38-3.59), exposure secondhand smoke within (AOR=3.869;95%CI:2.835-5.280) and outside their home (AOR= 1.514; 95%CI: 1.100-2.084) and exposure to tobacco industry promotion (AOR=2.986; 95%CI:2.246-3.969) were predictors of current tobacco use among adolescents. Similarly, Exposure to tobacco industry promotion (AOR=.2.669;95%CI:1.610-4.425) were associated with non-cigarette tobacco use. Adolescents exposed to anti-smoking education in schools were less likely to use non-cigarette tobacco (AOR=0.523;95% CI:0.311-0.881) than those not exposed to anti-smoking education in schools.

Conclusion

One in seven school-going adolescents smoke cigarettes, and approximately one in 20 school-going adolescents use non-cigarette tobacco products in Comoros. Exposure to secondhand smoke within and outside the home and exposure to tobacco industry promotion were associated with tobacco use in school-going adolescents in Comoros. Our findings suggest the need for adolescent-friendly gender-sensitive tobacco interventions, including strengthening existing tobacco control laws to prevent and reduce tobacco use among school-going adolescents in Comoros.

Background

Globally, tobacco use is considered a significant risk factor for non-communicable diseases, including nicotine addiction, and a means through which youths are introduced to using other illegal substances(1–3). In recent years, low- and middle-income countries have started experiencing the public health impact of non-communicable diseases related to the increased use of tobacco products(4). This increased utilisation rate has been attributed to the influx of transnational tobacco companies in these countries due to weak tobacco legislations and policies, low levels of education and demographic shift in the population in these areas(5, 6). Studies conducted in African countries have reported increasing use of tobacco products among adolescents(7–9). Factors such as being male, exposure to secondhand smoking withing and outside the home, peer influence and exposure tobacco industry promotion, advertisement and sponsorship have been associated with use tobacco products among adolescents(7–10).

Comoros is an archipelago located in the Indian Ocean, north of the Mozambique Channel and northeast Madagascar, and composed of three main islands (Grande Comore, Anjouan and Mohéli)(11). Comoros is a developing country with 25% of poor population below the country’s poverty line, and is known to have poor health outcomes such as high maternal and child mortality compared to its neighbouring island nations of Mauritius and Seychelles(12, 13). In 2018, one in five adults in Comoros used tobacco, which creates a future public health threat(14). This public health threat is compounded by the fact that non-communicable disease is a major public health concern in Comoros(15, 16). In 2008, 25.4% of the population had
high blood pressure, 4.8% had diabetes, and 25.9% had high cholesterol levels(15). Death due to non-communicable diseases has increased from 42% in 2015 to 45% in 2019(17). Similar to other African countries, Comoros, in 2006, became a signatory to the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC). In line with the WHO-FCTC framework, Comoros enacted three laws since 2010 that regulate tobacco product use(18). These regulations include the use of smoke-free places, tobacco advertising, promotion and sponsorship, and tobacco packaging and labelling(18). Despite the impact of these laws in reducing tobacco use prevalence from 30.4% in 2007 to 19.5% in 2018, tobacco use remains high(14). This relatively high use maybe due to ambiguity in the interpretation of some of the laws. For example, even though smoking is banned in all public places, the legal instruments are hard to explain due to discrepancies and conflicting provisions in the law(18). Another reason for the high use of tobacco maybe due to non-adherence to the WHO-FCTC recommendation. For instance, Comoros currently levies a 25% excise tax on the retail price of tobacco products, which is far below the WHO tobacco excise taxes recommended threshold of 70% on all the retail price of tobacco products(18).

Given that most adult smokers initiate smoking during adolescence, it highlights the need to understand the tobacco use behaviour among adolescents(5). Currently, tobacco use research in Comoros have focussed on adults(15), with little or no research on adolescents who account for more than half of the population(13). Therefore, this study aims to estimate the prevalence and identify key factors associated with tobacco use among adolescents in Comoros using data obtained in the 2015 Comoros Global Youth Tobacco Survey. An understanding of the tobacco use behaviour among adolescents will inform public health policy and intervention designed to prevent adolescents' tobacco use initiation and transition into future adult smokers.

Methods

Study Design and Comoros Global Youth Tobacco Survey

We used data obtained from the Comoros Global Youth Tobacco Survey (GYTS) administered in 2015 by the Ministry of Health. The survey collected tobacco use information from 2,810 eligible school-going adolescents aged between 11-17 years. GYTS uses a global standardised methodology that measures and tracks key tobacco control indicators(19). The survey is designed to obtain relevant information on tobacco use prevalence and its associated determinants such as secondhand smoke (SHS), pro-and anti-tobacco media and advertising, access to and availability of tobacco products, and knowledge and attitudes regarding tobacco use. Details of the survey methodology have been described in previous studies(19). Basically, the survey methodology involves a two-stage sample design in which schools are chosen with a probability proportional to enrolment size in the first stage. In the second stage, classes are selected randomly within these schools. Students in the selected classes were eligible and had an equal chance of being chosen. The overall response rate was 83.8%(20).

Study measures

Two outcome measures were used to measure tobacco use among adolescents in Comoros. These include current cigarette smoking and the current use of non-cigarette tobacco products. Current cigarette smoking status was determined by respondents' choice of one or more days to the question, "During the past 30 days, on how many days did you smoke cigarettes?" Current use of non-cigarette tobacco products was determined by recording respondent choice to any of the following two questions – "During the past 30 days, did you use any form of smoked tobacco products other than cigarettes (e.g., cigars, water pipes, cigarillos, little cigars, pipes)?" and "During the past 30 days (one month), did you use any form of smokeless tobacco products (e.g., chewing tobacco, snuff, dip)?". The following measures were considered as independent factors based on the available literature(7-9, 21). These factors were constructed from 28 questions. This includes age, sex, average spending per week, parental or peer smoking, exposure to secondhand smoke inside or outside the home, exposure to smoking or anti-smoking media messages, exposure to tobacco industry promotions, perception about smoking,
knowledge about harmful effects of smoking and SHS as well as attitudes toward smoking ban(20). **Table 1** gives further details of how the dependent and independent variables were defined and dichotomized in this study.

**Ethical approval**

No ethics approval was required for this study since it is a secondary analysis of the Comoros Global Youth Tobacco Survey (GYTS) dataset, which is available in the public domain. Ethics approval was sought from the Ministry of health of Comoros prior to collecting the primary data. Informed consent was obtained from the school authorities involved in the survey and the parents and guardians of adolescents enrolled in the survey.

**Data Analysis**

We used the Statistical Package for Social Science (IBM, SPSS 27.0) to analyse our data. To estimate the prevalence of current cigarette smoking and current use of non-cigarette tobacco products, we reported weighted data to adjust for sampling design effect and missing values due to non-responses at school, class, and student levels. Due to established gender differences regarding tobacco use, we conducted separate analyses for male and female adolescents. We employed complex sample logistic regression analyses to determine the correlates of current cigarette smoking and current use of non-cigarette tobacco products. We reported an adjusted odds ratio (AOR) and 95% confidence interval (CI). A p-value less than 0.05 (p-value<0.05) was considered statistically significant.

**Results**

**Characteristics of study population**

Two thousand eight hundred and ten school-going adolescents took part in the study. Close to half of them were males (48.1%) and more than half were between the age of 13-15 years (55.3%). Close a quarter of were exposure to parental smoking (21.2%). More than a quarter (28.8%) and close to two-thirds (59.6%) were exposed to secondhand smoke in and outside their homes respectively. Please see **Table 2** for details.

**Current cigarette use**

**Tables 3** described the prevalence of current cigarette smoke and non-cigarette tobacco product use among school-going adolescents in Comoros. The overall prevalence of current cigarette smoking was 14.3%, with a significant difference between males (18.5%) and females (9.9%). The prevalence of current cigarette smoking was highest among adolescents exposed to secondhand smoke outside the home (78.2%), followed by those who favoured the smoking ban (76.6%). A similar pattern was observed among male students. Among females, the prevalence of current cigarette smoking was highest among those with income (74.1%), followed by exposure to secondhand smoke in and outside their homes respectively. 

**Table 4** shows predictors of current cigarette smoking and non-cigarette tobacco product use among male and female adolescents in Comoros. Males were two times more likely to be current cigarette smokers compared to females (AOR=2.23;95%CI:1.38-3.59). Adolescents aged 13-15 years (AOR= 3.05; 95%CI:1.50-6.20) and 16 and above (AOR=4.85; 95%CI: 2.50-9.38) were more likely to be current cigarette smokers than those 12 years and younger. A similar association was observed among males but not females. Adolescents exposed to secondhand smoke within (AOR=3.869;95%CI:2.835-5.280)) and outside their home (AOR= 1.514; 95%CI: 1.100-2.084) were more likely to be current cigarette smokers compared to those who were not exposed. Similarly, exposure to secondhand smoke in the home was a predictor of current cigarette smoking among adolescents (AOR=4.865; 95%CI:3.873-6.111) and females (AOR=2.903; 95%CI:1.331-6.331). However, exposure to secondhand smoke outside the home was a predictor of current cigarette smoking only among males (AOR=1.763;95%CI:1.195-2.601) but not females (AOR=1.140;95%CI:0.608-2.136). Exposure to tobacco industry promotion was found to be a predictor of current cigarette smoking among adolescents in general (AOR=2.986; 95%CI:2.246-3.969), and this was the case for both males (AOR=2.760;95%CI:1.871-4.071) and females (AOR= 3.419;95%CI: 1.899-6.155).
Current use of non-cigarette tobacco products

The overall prevalence of current use of non-cigarette tobacco products was 5.8%, with a higher prevalence in males (6.7%) compared to females (4.9%). The prevalence of current use of non-cigarette tobacco products was highest among adolescents who favoured a smoking ban (78.6%), followed by those exposed to SHS outside the home (70.3%). A similar pattern was observed among males and females (See Table 3 for details).

Adolescents exposed to tobacco industry promotion were more likely to be current users of non-cigarette tobacco products than those not exposed to tobacco industry promotion (AOR=2.669;95%CI:1.610-4.425). Similar relationship between exposure to tobacco industry promotion and non-cigarette tobacco use was observed among males (AOR=2.689;95%CI:1.406-5.142) and females (AOR=2.589;95%CI:1.316-5.094). Adolescents who received anti-smoking education in schools were 52% less likely to be current non-cigarette tobacco users (AOR=0.523;95%CI:0.311-0.881) than those not exposed to anti-smoking education in school. Among males, being knowledgeable about the harmful effects of smoking and SHS was a predictor of current use of non-cigarette tobacco products (AOR=1.685;95%CI:1.019-2.784). (See Table 4 for details)

Discussion

This is the first nationally representative study of school-going adolescents in Comoros regarding their tobacco use behaviour (cigarette smoking and use of non-cigarette tobacco products). We found that 14.3% of school-going adolescents in Comoros were smoking cigarettes, with a higher prevalence observed in males than females. Our prevalence was higher than those reported in studies conducted in Ghana(7), Malawi(22), and East African countries(Sudan and South Sudan, Kenya, Tanzania, and Ethiopia) (21, 23). On the other hand, our prevalence of current cigarette smoking was lower than the rates reported in Madagascar(9), Ville du Sud, Cote d’Ivoire(24) and Southeast Nigeria(25). Also, 5.8% of school-going adolescents in Comoros were current users of non-cigarette tobacco products, with more users observed among males than females. Our rate is lower than the rates reported in similar studies conducted in Madagascar(9), the Republic of Congo(8), Sudan and South Sudan(21), but higher than the prevalence reported in a study conducted in Ilala Municipality, Tanzania(26). Our findings suggest the need for youth-friendly tobacco control policies and interventions that are gender-sensitive. Even though the prevalence of non-cigarette tobacco products is relatively lower than cigarette smoking, non-cigarette tobacco products such as cigars and pipes are equally harmful as cigarettes. Thus, it is important that, in addition to cigarettes, the adverse effects of non-cigarette tobacco products should be part of tobacco control interventions such as public education and advocacy strategies targeting adolescents in Comoros.

Our findings indicate a high level of tobacco use among adolescents exposed to secondhand smoke both within and outside the home in Comoros. Adolescents exposed to secondhand smoke inside and outside the home were more likely to be current cigarette smokers, observed in both males and females. In contrast, exposure to secondhand smoke inside and outside the house was not significantly associated with using non-cigarette tobacco products. Our findings are in line with a similar study conducted in Madagascar, Sudan and South Sudan in which exposure to secondhand smoking outside the home was found to be a predictor of current cigarette smoke(9, 21). At the same time, our finding contrasts with a Madagascan study in which secondhand smoke inside the home was a predictor of non-cigarette tobacco products use(9) and a Congolese study in which having a parent or friend who smokes was associated with using smokeless tobacco(8). Our findings highlight the strong influence of familial and outdoor smoking on adolescents’ cigarette smoking behaviour, as reported in previous studies(27, 28). Such influence on youth tobacco use is explained by the fact that adolescents tend to indulge in high-risk behaviours practised by their parents, siblings, or community members because they consider it normal(29). Our finding suggests that tobacco prevention and control intervention targeting adolescents in Comoros should design educational campaigns for parents and other household members. Such a campaign should inform household members of the extent of their influence on their adolescent smoking behaviour and provide ways to prevent adolescents from smoking tobacco. The influence of secondhand smoke outside the home on cigarette smoking among adolescents in our study may be due to the ineffective implementation of the law prohibiting tobacco use in public places.
and workplaces in Comoros(30). The weak implementation of the smoke-free laws has been attributed to inconsistencies and contrasting provisions within tobacco control laws in Comoros(18, 30). For instance, based on the current provisions, it is difficult to ascertain whether smoking is prohibited in primary/secondary schools, shops and Casinos(30). Also, there is no clear indication of what agency is responsible, and there is no clear duty to enforce the smoke-free law(30). Going forward, smoke-free tobacco laws need to be revised to remove any ambiguity in their interpretation. Also, in line with article 8 of the WHO-FCTC(31), the legislation should indicate the agency responsible for enforcing the law. Also, the ineffective implementation of tobacco laws in Comoros maybe due to lack of follow up in the implementation of health policies by successive governments due political instability in the country, and sometimes variability in the implementation health policies between the central government in Grande Comore and the local semi-autonomous governments in the other islands (Anjouan and Moheli) due to differences in their political ideologies(32). Further studies are needed to explore the impact of previous political insecurity and instability in the implementation of tobacco laws in Comoros.

Consistent with other studies similar studies conducted in other developing countries(7-10, 21, 33), exposure to tobacco industry promotions was significantly associated with cigarette smoking and non-cigarette tobacco use in our study. The increased exposure of adolescents to tobacco industry promotions and its association with tobacco use may be due to the increased penetration of tobacco companies into the Comorian market, which may be attributed to low tobacco taxes, partial ban on tobacco promotion, and weak regulation of anti-tobacco promotion laws. Previous research has demonstrated that countries with less comprehensive weak tobacco promotion, advertisement and sponsorship regulations have a higher rate of adolescent tobacco use compared to those with comprehensive and stricter laws, which are fully implemented(34, 35). Our finding further supports the link between tobacco product promotion and adolescent tobacco use. Currently, there are ambiguities in the interpretation of Comoros's tobacco promotion and advertisement laws, and these legislations are not strictly in line with WHO-FCTC Article 13 guidelines(30). The law allows tobacco product sales via the internet and point of sale advertisement and promotion, and tobacco product display. Also, the law does not address vending machine sales of tobacco products and does not explicitly address cross-border advertising broadcast from outside of Comoros and does not address retailer incentive programs(30). Comoros’ weak and ambiguous tobacco advertisement and promotion laws provide an opportunity for the tobacco industry to identify loopholes in current legislation or find innovative ways to promote their product among adolescents. A case in point is the use of the internet to promote and sell their products. Compared with other exposure channels, the internet has been reported to be a leading conduit used by tobacco companies to promote, advertise, and sell their products to adolescents in developed countries(36, 37). Exposure to tobacco promotion via the internet has been associated with traditional and alternative forms of tobacco use(37, 38). Currently, it is unknown whether such exposure channels (e.g., internet, point of sales etc.) are widely used by tobacco companies in Comoros and that influence adolescent tobacco use among adolescents. Further studies need to explore this area of enquiry. Given the adverse health effect of tobacco use and the increase in tobacco related chronic conditions in Comoros, it is important that existing tobacco industry promotion advertisement and sponsorship laws are revised and implemented consistent with WHO-FCTC article 13 guidelines(39). Such interventions will help prevent adolescents from becoming adult smokers. To contribute to prevent and reduce tobacco use among adolescents in Comoros, the harmful effects of tobacco use should be taught in all high schools, given that adolescents who received anti-smoking education in schools in our study were less likely to be current users of non-cigarette tobacco.

It is important for readers to bear in mind the following limitation when interpreting our findings. Given the cross-sectional design employed in this study, no causal relationship can be made between the outcome and independent variables. Also, the study is prone to recall bias, given that responses were based on participant self-report. In addition, our findings are not representative of all adolescents in Comoros as only school-going adolescents were included in the study. Only individual-level measures were used based on the GYTS questionnaire. Other variables relating to national tobacco control programs or policies in Comoros that could have influenced tobacco use among adolescents were not included. Further, we could not determine whether adolescent tobacco use behaviour varied in the three islands that constitute Comoros and the association between tobacco use peer smoking as data on peer smoking was not provided in the dataset. Nonetheless, this study is the first study that examines the prevalence and correlates of tobacco use among school-going adolescents in Comoros using
the most recent Comoros GYTS dataset and provides the baseline insight for future studies into tobacco use behaviour in Comoros.

**Conclusion**

Our study finds that one in seven school-going adolescents in Comoros smoke cigarettes, with a significant gap between males and females. Also, in our study, approximately one in 20 school-going adolescents use non-cigarette tobacco products, but no significant gender gap exists. Exposure to secondhand smoke in and outside the house was significantly associated with the current use of cigarettes. Irrespective of gender, exposure to tobacco industry promotion was significantly associated with the current use of non-cigarette tobacco products among school-going adolescents in Comoros. In addition, adolescents who received anti-smoking education in schools in our study were less likely to be current non-cigarette tobacco users.

Our findings suggest the need to implement the following recommendations to help to prevent and reduce tobacco use among school-going adolescents in Comoros.

- In addition to cigarettes, the adverse effects of non-cigarette tobacco products should be part of tobacco control interventions such as public education and advocacy strategies targeting adolescents in Comoros.
- Tobacco prevention and control interventions targeting adolescents in Comoros should design educational campaigns for parents and other household members. Such a campaign should inform household members of the extent of their influence on their adolescent smoking behaviour and provide ways how they can prevent adolescents from smoking tobacco.
- Tobacco smoke-free laws need to be revised to remove any ambiguity in their interpretation and implemented in accordance with the WHO-FCTC Article 8 guidelines.
- Existing tobacco industry promotion advertisement and sponsorship laws need to be revised and implemented consistent with WHO-FCTC article 13 guidelines. Such interventions will help prevent adolescents from becoming adult smokers.
- The teaching of the harmful effects of tobacco use should be mandatory in all high schools in Comoros.

**Abbreviations**

CI: Confidential Intervals

FCTC: Framework Convention on Tobacco Control

GYTS: Global Youth Tobacco Survey

GTS: Global Tobacco Surveillance

OR: odds ratio

SHS: second-hand smoke

SPSS: Statistical Package for The Social Sciences

WHO: World Health Organization

**Declarations**

*Ethics approval and consent to participate*
No ethics approval was required for this study since it is a secondary analysis of the Comoros Global Youth Tobacco Survey (GYTS) dataset, which is available in the public domain. Ethics approval was sought from the Ministry of health of Comoros prior to collecting the primary data. Informed consent was obtained from the school authorities involved in the survey and the parents and guardians of adolescents enrolled in the survey.

**Consent for publication**

Not Applicable

**Availability of data and materials**

The dataset informing the findings of this study is freely available via the WHO NCD Microdata Repository [https://extranet.who.int/ncdsmicrodata/index.php/catalog/123](https://extranet.who.int/ncdsmicrodata/index.php/catalog/123)

**Competing interests**

The authors declared no conflict of interest

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No funding was obtained for this study.

**Authors’ contributions**

PBJ, SAK and JAK conceptualised the study. PBJ designed the data analysis plan, conducted the analysis, interpreted the results, and wrote the first draft of the manuscript. SAK participated in the interpretation of the results and contributed to writing the manuscript. JAK and CK, participated in the interpretation of the results and edited the manuscript. All authors read and approved the final manuscript.

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Table 1: Study measures, survey items with responses, 2015 Comoros Global Youth Tobacco Survey (GYTS)

| Measure | Survey Item | Response Options |
|---------|-------------|------------------|
| Measure 1 | Question 1 | Choice 1, Choice 2, Choice 3 |
| Measure 2 | Question 2 | Choice A, Choice B, Choice C |
| Measure 3 | Question 3 | Yes, No, Maybe |
| Measure 4 | Question 4 | Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree |

Note: The table continues with more rows as described in the original document.
| Study measure | GYTS survey items | GYTS item responses | Dichotomized measure |
|---------------|------------------|---------------------|---------------------|
| Dependent variable: current cigarette use | During the past 30 days, on how many days did you smoke cigarettes? | 0 days | No- 0 days |
| | | 1 or 2 days | Yes- 1 or more days |
| | | 3 to 5 days |  |
| | | 6 to 9 days |  |
| | | 10 to 19 days |  |
| | | 20 to 29 days |  |
| | | All 30 days |  |
| Current use of non-cigarette tobacco products | During the past 30 days, did you use any form of smoked tobacco products other than cigarettes (such as cigar, pipe water pipe and shisha)? | Yes | Yes |
| | | No | No |
| | During the past 30 days, did you use any form of smokeless tobacco products (e.g. chewing tobacco, snuff, dip)? | Yes | Yes |
| | | No | No |

| Independent variables |
|-----------------------|
| Age | How old are you? | 11 years old or younger | ≤12 years |
| | | 12 years old | 13-15 years |
| | | 13 years old |  |
| | | 14 years old | ≥16 years |
| | | 15 years old |  |
| | | 16 years old |  |
| | | 17 years old or older |  |
| Sex | What is your sex? | Male | Male |
| | | female | female |
| Grade / form | In what grade/form are you? | 6 eme | 6 eme |
| | | 5 eme | 5 eme |
| | | 4 eme | 4 eme |
| | | 3 eme | 3 eme |
| Money to be spent on average week | During an average week, how much money do you have that you can spend on yourself, however you want? | I usually don't have any spending money | No Money- I usually don't have any spending money |
| | | | Have money- any other responses for any of the |
| Parental smoking | How often do you see your father (stepfather or mother's partner) smoking in your home? | Don't have/Don't see this person | No- Don't have/Don't see this person and Never | No- no for both dichotomized items |
|-------------------|-------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------|--------------------------------|
|                   | About every day                                                                                  | Yes- About every day and Sometimes |                                             |                                |
|                   | Sometimes                                                                                        |                                  |                                             |                                |
|                   | Never                                                                                           | No- Don't have/Don't see this person and Never | Yes - for both dichotomized items |                                |

| How often do you see your mother (stepmother or father's partner) smoking in your home | Don't have/Don't see this person | No- Don't have/Don't see this person and Never | No- no for all three dichotomized items |
|--------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------|--------------------------------|
|                                                                                | About every day                  | Yes- About every day and Sometimes |                                |
|                                                                                | Sometimes                        |                                  |                                |
|                                                                                | Never                             | No- Don't have/Don't see this person and Never |                                |

| SHSb exposure in your home | During the past 7 days, on how many days has anyone smoked inside your home, in your presence? | 0 days | No- 0 days |
|---------------------------|-------------------------------------------------------------------------------------------------|--------|------------|
|                           | 1 to 2 days                                                                                     | No- 0 days | Yes- 1 to 2 days |
|                           | 3 to 4 days                                                                                     | Yes- 1 to 2 days | 3 to 4 days |
|                           | 5 to 6 days                                                                                     | 3 to 4 days | 5 to 6 days |
|                           | 7 days                                                                                            | 5 to 6 days | 7 days |

| SHSb exposure outside home | During the past 7 days, on how many days has anyone smoked in your presence, inside any enclosed public place, other than your home (such as office, school, shops, restaurants, cinemas, night club)? | 0 days | No- 0 days |
|----------------------------|-------------------------------------------------------------------------------------------------|--------|------------|
|                           | 1 to 2 days                                                                                     | No- 0 days | Yes- 1 to 2 days |
|                           | 3 to 4 days                                                                                     | Yes- 1 to 2 days | 3 to 4 days |
|                           | 5 to 6 days                                                                                     | 3 to 4 days | 5 to 6 days |
|                           | 7 days                                                                                            | 5 to 6 days | 7 days |

| During the past 7 days, on how many days has anyone smoked in your presence, inside any public transportation vehicles, such as trains, buses, or taxicabs? | I did not use public transportation during the past 7 days | No-“ I did not use public transportation during the past 7 days and “I used public transportation, but no one smoked in my presence” |                                |
| Question                                                                 | Yes | No | Yes | No |
|-------------------------------------------------------------------------|-----|----|-----|----|
| I used public transportation, but no one smoked in my presence          |     |    | 1 to 2 days |    |
| 3 to 4 days |    | 5 to 6 days |    | 7 days |
| During the past 7 days, on how many days has anyone smoked in your presence at any outdoor public place (such as playgrounds, sidewalks, entrances to buildings, parks, beaches, vehicle)? | 0 days | No- 0 days | 1 to 2 days | Yes-1 to 2 days |
| 3 to 4 days | Yes-3 to 4 days | 5 to 6 days | Yes-5 to 6 days | 7 days |
| Exposure to antismoking media messages During the past 30 days, how many antismoking media messages (e.g., television, radio, billboards, posters, newspapers, magazines, movies) have you seen? | Yes | Yes | No | No |
| Favour toward smoking ban Are you in favour of banning smoking in public places (such as in restaurants, in buses, streetcars, and trains, in schools, on playgrounds, in gyms and sports arenas, in discos)? | No | No | Yes | Yes |
| Knowledge about Do you think the smoke from other people's | Definitely not | No “Definitely not” for both |
| Harmful effects of SHS | cigarettes is harmful to you? | Probably not | Probably yes | Definitely yes | Yes - any other responses for either item |
|------------------------|--------------------------------|--------------|--------------|----------------|----------------------------------------|
| Tobacco industry promotion | Do you have something (t-shirt, pen, backpack, etc.) with a cigarette brand logo on it? | No | Yes | No | Yes |
| | Has a (cigarette representative) ever offered you a free cigarette? | No | Yes | No | Yes |
| Antismoking school education | During the past 12 months, were you taught in any of your classes about the dangers of tobacco use? | No | I don't know | Yes | I don't know |
| | | | | | Yes | Yes |

Table2: Characteristics of the Study population, Comoros Global Youth Tobacco Survey, 2015 (N= 2,810)
| Age          | Weighted % |
|--------------|------------|
| ≤12 years    | 9.5        |
| 13-15 years  | 55.3       |
| ≥16 years    | 35.2       |

| Sex          |           |
|--------------|-----------|
| Male         | 48.1      |
| Female       | 51.9      |

| Grade        |           |
|--------------|-----------|
| 6 eme        | 31.5      |
| 5 eme        | 25.1      |
| 4 eme        | 21.7      |
| 3 eme        | 21.8      |

| Possession of Average spending money/week |           |
|------------------------------------------|-----------|
| I have                                   | 70.2      |
| I do not have                            | 29.8      |
| Parental Smoke (Yes)                     | 21.2      |
| SHS exposure inside home (Yes)           | 28.8      |
| SHS exposure outside home (Yes)          | 59.6      |
| Exposure to smoking media messages (Yes) | 44.3      |
| Exposure to anti-smoking media messages (Yes) | 50.6  |
| Exposure to tobacco industry promotion (Yes) | 21.5  |
| Knowledge about harmful effects of SHS(Yes) | 69.7  |
| school anti-smoking education (Yes)      | 25.3      |
| Favour toward smoking ban (Yes)          | 74.6      |

Table 3: Prevalence of current cigarette smoking, and non-cigarette tobacco products use among male and female adolescents in Comoros, Global Youth Tobacco Survey, 2015 (N= 2,810)
| Characteristic                                      | Current cigarette smoker | Current user of noncigarette tobacco products |
|----------------------------------------------------|--------------------------|-----------------------------------------------|
| %<sup>a</sup>                                       | Total (%<sup>a</sup>)   | Male (%<sup>a</sup>)  | Female (%<sup>a</sup>) | Total (%<sup>a</sup>)   | Male (%<sup>a</sup>)  | Female (%<sup>a</sup>) |
|                                                    | 14.3                     | 18.5  | 9.9                     | 5.8                     | 6.7                     | 4.9                     |
| **Age**                                            |                          |       |                         |                          |                         |                         |
| ≤12 years                                          | 4.2                      | 3.5   | 4.9                     | 5.0                      | 5.0                      | 5.0                      |
| 13-15 years                                        | 53.4                     | 48.9  | 61.9                    | 45.4                     | 43.4                     | 48.6                     |
| ≥16 years                                          | 42.5                     | 47.6  | 33.2                    | 49.6                     | 51.7                     | 46.3                     |
| **Grade**                                          |                          |       |                         |                          |                         |                         |
| 6 eme                                              | 33.3                     | 35.8  | 28.5                    | 25.7                     | 31.6                     | 17.3                     |
| 5 eme                                              | 23.9                     | 21.6  | 26.4                    | 21.5                     | 21.0                     | 22.3                     |
| 4 eme                                              | 23.1                     | 25.2  | 20.1                    | 19.2                     | 20.5                     | 17.7                     |
| 3 eme                                              | 19.7                     | 17.4  | 25.0                    | 33.6                     | 26.9                     | 42.7                     |
| **Possession of Average spending money/week**       |                          |       |                         |                          |                         |                         |
| I have                                             | 73.6                     | 72.5  | 74.1                    | 67.8                     | 68.9                     | 67.2                     |
| I do not have                                      | 26.4                     | 27.5  | 25.9                    | 32.2                     | 31.1                     | 32.8                     |
| Parental Smoke (Yes)                               | 38.1                     | 36.1  | 39.1                    | 26.9                     | 22.8                     | 32.2                     |
| SHS exposure inside home (Yes)                     | 60.1                     | 63.3  | 57.1                    | 39.4                     | 45.1                     | 32.4                     |
| SHS exposure outside home (Yes)                    | 78.2                     | 81.0  | 72.7                    | 70.3                     | 73.0                     | 66.3                     |
| Exposure to smoking media messages (Yes)           | 64.9                     | 67.4  | 59.2                    | 55.5                     | 58.9                     | 50.6                     |
| Exposure to anti-smoking media messages (Yes)      | 53.9                     | 55.3  | 52.4                    | 60.8                     | 67.3                     | 52.1                     |
| Exposure to tobacco industry promotion (Yes)       | 43.4                     | 44.4  | 40.3                    | 40.5                     | 43.8                     | 36.2                     |
| Knowledge about harmful effects of SHS(Yes)        | 68.0                     | 70.1  | 63.7                    | 62.4                     | 59.5                     | 65.7                     |
| school anti-smoking education (Yes)                | 31.8                     | 32.3  | 30.3                    | 37.4                     | 38.4                     | 36.2                     |
| Favour toward smoking ban (Yes)                    | 76.6                     | 79.4  | 72.0                    | 78.6                     | 81.8                     | 74.1                     |

SHS: Secondhand Smoke

Table 4: Predictors of current cigarette smoking and non-cigarette tobacco product use among male and female adolescents (N= 2,810)
| Characteristic                      | Current cigarette smoker | Current user of noncigarette tobacco products |
|------------------------------------|--------------------------|-----------------------------------------------|
| %a                                 |                          |                                               |
|                                    | Total AOR (95% CI)       | Male AOR (95% CI)                            |
|                                    | Female AOR (95% CI)      | Total AOR (95% CI)                           |
|                                    | Male AOR (95% CI)        | Female AOR (95% CI)                          |
| Sex male                           | 2.23 (1.38-3.59)         | 1.221 (0.818-1.821)                          |
| Female                             | 1                        | 1                                             |
| Age                                |                          |                                               |
| ≤12 years                          | 1                        | 1                                             |
| 13-15 years                        | 3.05 (1.50-6.20)         | 1.221 (0.818-1.821)                          |
|                                    | 4.26 (1.566-11.608)     | 0.754 (0.127-4.462)                          |
| ≥16 years                          | 4.85 (2.50-9.38)         | 1.009 (0.330-3.089)                          |
|                                    | 8.552 (3.10-23.58)      | 1.930 (0.846-4.404)                          |
|                                    | 2.340 (0.913-5.997)     | 1.099 (0.330-3.089)                          |
|                                    | 1.800 (0.620-5.229)     | 0.754 (0.127-4.462)                          |
|                                    | 1.568 (0.263-9.345)     | 1.221 (0.818-1.821)                          |
|                                    | 2.140 (0.875-5.235)     | 1.221 (0.818-1.821)                          |
| Grade                              |                          |                                               |
| 6 eme                              | 2.38 (1.35-4.19)         | 1.200 (0.772-1.865)                          |
|                                    | 3.48 (1.29-9.40)        | 0.941 (0.574-1.542)                          |
|                                    | 1.44 (0.59-3.53)        | 1.702 (0.764-3.791)                          |
|                                    | 0.845 (0.476-1.500)     | 0.914 (0.400-2.087)                          |
|                                    | 1.343 (0.690-2.614)     | 0.660 (0.219-1.988)                          |
|                                    | 0.577 (0.220-1.510)     | 1.220 (0.525-2.832)                          |
| 5 eme                              | 1.21 (0.77-1.90)         | 3.869 (2.835-5.280)                          |
|                                    | 1.01 (0.50-2.07)        | 1.763 (1.195-2.601)                          |
|                                    | 1.58 (0.605-4.123)      | 1.140 (0.608-2.136)                          |
|                                    | 0.738 (0.437-1.244)     | 1.702 (0.764-3.791)                          |
|                                    | 0.704 (0.280-1.774)     | 0.914 (0.400-2.087)                          |
|                                    | 0.800 (0.389-1.643)     | 0.660 (0.219-1.988)                          |
|                                    | 1.220 (0.525-2.832)     | 1.220 (0.525-2.832)                          |
| 4 eme                              | 1.43 (0.82-2.520)        | 3.869 (2.835-5.280)                          |
|                                    | 1.67 (0.84-3.34)        | 1.763 (1.195-2.601)                          |
|                                    | 1.139 (0.409-3.173)     | 1.140 (0.608-2.136)                          |
|                                    | 0.627 (0.395-0.995)     | 1.702 (0.764-3.791)                          |
|                                    | 0.772 (0.356-1.671)     | 0.914 (0.400-2.087)                          |
|                                    | 0.517 (0.250-1.071)     | 0.660 (0.219-1.988)                          |
| 3 eme                              | 1                        | 1                                             |
|                                    | 1                        | 1                                             |
| Possession of Average spending money/week |                          |                                               |
| I have                             | 0.89 (0.627-1.27)        | 1.200 (0.772-1.865)                          |
|                                    | 0.852 (0.573-1.265)     | 0.941 (0.574-1.542)                          |
|                                    | 0.952 (0.619-1.465)     | 1.702 (0.764-3.791)                          |
|                                    | 0.822 (0.607-1.113)     | 0.914 (0.400-2.087)                          |
|                                    | 0.634 (0.354-1.135)     | 0.660 (0.219-1.988)                          |
|                                    | 1.155 (0.659-2.025)     | 1.220 (0.525-2.832)                          |
| I do not have                      | 1                        | 1                                             |
| Parental Smoke (Yes)               | 1.200 (0.772-1.865)     | 1.200 (0.772-1.865)                          |
|                                    | 0.941 (0.574-1.542)     | 0.941 (0.574-1.542)                          |
|                                    | 1.702 (0.764-3.791)     | 1.702 (0.764-3.791)                          |
|                                    | 0.914 (0.400-2.087)     | 0.914 (0.400-2.087)                          |
|                                    | 0.660 (0.219-1.988)     | 0.660 (0.219-1.988)                          |
|                                    | 1.220 (0.525-2.832)     | 1.220 (0.525-2.832)                          |
| No                                 | 1                        | 1                                             |
| SHS exposure inside home (Yes)     | 3.869 (2.835-5.280)     | 1.514 (1.100-2.084)                          |
|                                    | 4.865 (3.873-6.111)     | 1.763 (1.195-2.601)                          |
|                                    | 2.903 (1.331-6.331)     | 1.140 (0.608-2.136)                          |
|                                    | 1.494 (0.904-2.468)     | 1.415 (0.860-2.327)                          |
|                                    | 2.081 (0.983-4.403)     | 1.356 (0.828-2.220)                          |
|                                    | 0.988 (0.475-2.055)     | 1.447 (0.517-4.049)                          |
| No                                 | 1                        | 1                                             |
| SHS exposure outside home (Yes)    | 1.514 (1.100-2.084)     | 1.514 (1.100-2.084)                          |
|                                    | 1.763 (1.195-2.601)     | 1.763 (1.195-2.601)                          |
|                                    | 1.140 (0.608-2.136)     | 1.140 (0.608-2.136)                          |
|                                    | 1.415 (0.860-2.327)     | 1.415 (0.860-2.327)                          |
|                                    | 1.356 (0.828-2.220)     | 1.356 (0.828-2.220)                          |
|                                    | 1.447 (0.517-4.049)     | 1.447 (0.517-4.049)                          |
| No                                 | 1                        | 1                                             |
| Exposure to smoking media messages (Yes) | 1.194 (0.857-1.663) | 1.194 (0.857-1.663) |
|                                    | 1.223 (0.769-1.943)     | 1.223 (0.769-1.943) |
|                                    | 1.224 (0.719-2.083)     | 1.224 (0.719-2.083) |
|                                    | 0.886 (0.647-1.213)     | 0.886 (0.647-1.213) |
|                                    | 1.059 (0.665-1.686)     | 1.059 (0.665-1.686) |
|                                    | 0.741 (0.477-1.150)     | 0.741 (0.477-1.150) |
| Exposure to anti-smoking media messages (Yes) | No | 1  | 1  | 1  | 1  | 1  | 1  |
|---------------------------------------------|----|----|----|----|----|----|----|
|                                             |    | 1.265(0.915-1.751) | 1.254(0.715-2.197) | 1.178(0.851-1.631) | 0.943(0.670-1.328) | 0.599(0.340-1.054) | 1.403(0.769-2.561) |
| Exposure to tobacco industry promotion (Yes) | No | 1  | 1  | 1  | 1  | 1  | 1  |
|                                             |    | 2.986(2.246-3.969) | 2.760(1.871-4.071) | 3.419(1.899-6.155) | 2.669(1.610-4.425) | 2.689(1.406-5.142) | 2.589(1.316-5.094) |
| Knowledge about harmful effects of smoking and SHS(Yes) | No | 1  | 1  | 1  | 1  | 1  | 1  |
|                                             |    | 1.133(0.842-1.524) | 1.061(0.694-1.624) | 1.390(0.799-2.418) | 1.325(0.842-2.086) | 1.685(1.019-2.784) | 1.053(0.530-2.092) |
| school anti-smoking education (Yes) | No | 1  | 1  | 1  | 1  | 1  | 1  |
|                                             |    | 0.923(0.750-1.137) | 0.995(0.669-1.481) | 0.827(0.520-1.313) | 0.523(0.311-0.881) | 0.551(0.301-1.007) | 0.522(0.208-1.312) |
| Favour toward smoking ban (yes) | No | 1  | 1  | 1  | 1  | 1  | 1  |
|                                             |    | 1.140(0.793-1.640) | 0.973(0.652-1.454) | 0.1512(0.780-2.932) | 0.937(0.587-1.495) | 0.742(0.274-2.013) | 1.198(0.874-1.643) |

SHS- Second hand smoke

* p<0.05