

# Cigarette smoking among school-going adolescents in Kafue, Zambia

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## Abstract

**Introduction:** Cigarette smoking is a leading cause of global morbidity and mortality. Interest in developing countries smoking prevalence has been growing since 1999.

**Objectives:** To estimate the prevalence of current cigarette smoking and associated factors among school-age adolescents in Kafue, Zambia.

**Methods:** A cross sectional study was conducted using standard Global Youth Tobacco Survey (GYTS) methodology. Frequencies and odds ratios were obtained to assess the association between selected factors and current cigarette smoking.

**Results:** Data on current smoking were available for 1872 adolescents, of whom 891 (47.6%) were males and 981 females. Overall 154 (8.2%) adolescents were current cigarette smokers, while 93 (10.4%) males and 61 (6.2%) females were current smokers ( $p < 0.001$ ). The majority of the smokers usually smoked at their own home or at a friend's house. Having some pocket money, having friends or parents who are smokers, and being exposed to pro-tobacco advertisements at social gatherings were associated with being a current cigarette smoker.

**Conclusions:** The traditional factors associated with smoking among adolescents elsewhere are also associated with smoking among adolescents in Kafue, Zambia. Public health interventions aimed to reduce adolescent smoking should be designed with these identified associations in mind.

## Introduction

Tobacco is the single most important cause of chronic morbidity in the developed world.<sup>1-4</sup> Although the bulk of morbidity and mortality in the sub-Saharan Africa arises from communicable diseases, overall the contribution of tobacco use to illhealth in the developing world has been growing. Tobacco is the leading cause of cancers, chronic obstructive airways diseases and cardiovascular mortality.<sup>1-7</sup>

Cigarette smoking among adolescents is of public health importance as many adult smokers started smoking as adolescents or young adults. Smoking among adolescents has also been reported to be associated with other unhealthy life styles such as alcohol consumption, illicit drug use and pre-marital sex. Adolescent smokers are also likely to be truant from school, an experience that may further jeopardise their future life chances in life<sup>8-10</sup>.

Since 1999, there has been growing interest in estimating the prevalence of adolescent tobacco use and associated social and political environmental factors. This impetus has largely been spearheaded by the Global Youth Tobacco Survey Collaborative Group<sup>11-14</sup>.

In this study we use data from the Global Youth Tobacco Survey (GYTS) conducted in Kafue, Zambia to estimate

the prevalence of current cigarette smoking and associated factors. This information is important in the design, implementation of public health interventions aimed to prevent adolescents' tobacco use in particular and overall health promotion among this population group.

## Methods

The study was conducted in Kafue district, which is situated in Lusaka province, 45 km south of the Lusaka capital city of Zambia. The district had 77001 males and 73216 females<sup>15</sup>. Major crops that are produced in the district were cotton and maize. Tobacco was only marginally produced.

Basic schools cater for Grades 1 to 7 and Secondary schools cater for Grades 8 to 12. The district had 60 Basic schools and 7 Secondary schools by the year 2003. Totals of 4525, 645 and 746 adolescents were in grades 7, 8 and 9, respectively, in the male: female ratios of 1:0.9, 1:0.6 and 1:0.6, respectively<sup>16</sup>.

The Kafue GYTS was conducted in 2002 as a cross sectional study, aimed to estimate the prevalence of tobacco use and associated personal and social environmental factors. School-going adolescents in Grades 7 to 9 were recruited using a two-stage probability sampling technique. In the first stage of sampling, primary sampling units were schools which were selected with a probability of being selected proportional to their enrolment size. In the second step, a random sample of classes in the selected school was obtained. All students in the selected classes were eligible to participate. A self administered questionnaire was used and included 'core GYTS questions as has been described elsewhere regarding the GYTS methodology<sup>11-14</sup>. Permission to conduct the study was obtained from the Ministry of Education. For the purposes of this study we aimed to estimate the prevalence of current cigarette smoking, assess whether there were any gender differences in the number of cigarettes smoked per day, and assess other social environmental factors associated with current cigarette smoking. The variables assessed in this study are outlined in Table 1. Current smoking was defined as having smoked, even a single puff in the past 30 days preceding the day of questionnaire completion. Data were analysed using SPSS 11.5 (Chicago, Illinois, United States). Upon considering all factors that were significant at bivariate analyses, we conducted Backward logistic regression analysis to determine independent predictors of current cigarette smoking.

## Results

Information on smoking status and sex was available from 1872 adolescents. There were 891 (47.6%) males and 981 females. Overall 154 (8.2%) adolescents were current cigarette smokers. Of the 891 males, 93 (10.4%) were current smokers, while 61 (6.2%) of 981 females were current smokers ( $p < 0.001$ ). Table 2 shows the frequency of smoking in the previous 30 days to the survey. Female respondents tended to smoke more cigarettes per day than males ( $p = 0.027$ ).

*Table 1. Variables considered in the analyses of factors associated with smoking***Dependent variable**

Have you ever smoked cigarettes, even a single puff, in the last 30 days? Yes/no

**Independent variables****Demographic, social and economic**

1. Age (11 or 12, 13, 14, 15, 16 or 17)

2. Grade (7, 8 or 9)

3. Received pocket money (yes or no)

**Parent and friends smoking status**

4. Parents smoked cigarettes (yes or no)

5. Closest friends smoked cigarettes (yes or no)

**Advertisements and campaigns against smoking**

6. Had seen anti-smoking media messages during the past 30 days (yes or no)

7. Had seen anti-smoking messages at social gatherings (yes or no)

8. Had seen actors smoking on TV, videos or movies (yes or no)

9. Had something such as a t-shirt or pen with a cigarette brand logo on it (yes or no)

10. Had seen cigarette brand names on TV during the past 30 days (yes or no)

11. Had seen advertisements for cigarettes on billboards during the past 30 days (yes or no)

12. Had seen advertisements for cigarettes in newspapers or magazines during the past 30 days (yes or no)

13. Had seen advertisements for cigarettes at social gatherings (yes or no)

**Effects of smoking on health**

14. Smoking cigarettes is less dangerous for young people because they can always stop later (yes or no)

15. Cigarette smoking is harmful to health (yes or no)

*Table 2. Number of cigarettes usually smoked per day during the past 30 days.*

Number of cigarettes usually smoked per day	Males Total=92 n (%)	Females Total=60 n (%)
<1	33 (35.9)	20 (33.3)
1	28 (30.4)	21 (35.0)
2-5	20 (21.7)	4 (6.7)
6+	11 (12.0)	15 (25.0)

Table 3 shows the places where the respondents usually smoked. Most respondents smoked at home (males 29.9%, females 23.5%) and at friends' houses (males 27.3%, females 29.4%).

*Table 3. Places where respondents usually smoked.*

Place	Males Total=77 n (%)	Females Total=51 n (%)
At own home	23 (29.9)	12 (23.5)
At friend's house	21 (27.3)	15 (29.4)
At school	10 (13.0)	7 (13.7)
At work	7 (9.1)	2 (3.9)
At social events	9 (11.7)	7 (13.7)
In public places*	4 (5.2)	3 (5.9)
Other	3 (3.9)	5 (9.8)

\* public places included parks, shopping centres and street corners

Table 1 shows the variables that were considered in the analyses of factors associated with smoking status. Only the sig-

nificant factors on bivariate analyses were further analysed in multivariate logistic regression.

**Factors associated with smoking among males**

Significant factors associated with smoking among males are shown in table 4.

Compared to boys in Grade 9, boys in Grade 8 were 43% (OR=0.57, 95%CI 0.38, 0.86) less likely to have been smokers. Boys who received pocket money were 2.30 (95%CI 1.75, 3.03) times more likely to have been smokers compared with those who did not receive pocket money. Boys who had something like a t-shirt or a pen with a cigarette brand logo on it were 47% (OR=1.47, 95%CI 1.10, 1.98) more likely to have been smokers compared with those who had no such things. Compared with boys who had not seen anti-smoking messages at social gatherings, boys who had seen such messages at social gatherings were 34% (OR=1.34, 95%CI 1.03, 1.75) more likely to have been smokers. Boys who had parents who smoked were 51% (OR=1.51, 95%CI 1.15, 1.97) more likely to have been smokers than boys who had non-smoking parents. Boys who had closest friends who smoked were 74% (OR=1.74, 95%CI 1.34, 2.27) more likely to smoke than boys who did not have closest friends who smoked.

**Factors associated with smoking among females**

Significant factors associated with smoking among females are shown in table 5.

Compared to girls in Grade 9, girls in Grade 7 were 94% (OR=1.94, 95%CI 1.26, 2.99) more likely to have been smokers. Girls who received pocket money were 2.41 (95%CI 1.72, 3.37) times more likely to have been smokers compared with girls who did not receive pocket money. Girls who had seen advertisements for cigarettes at social gatherings were 52% (OR=1.52, 95%CI 1.10, 2.09) more likely to have been smokers compared with girls who had not seen such advertisements at social gatherings. Compared with girls who did not have parents who smoked, girls who had parents who smoked were 63% (OR=1.63, 95%CI 1.17, 2.27) more likely to have been smokers. Girls who had closest friends who smoked were 72% (OR=1.72, 95%CI 1.23, 2.40) more likely to have been smokers.

**Discussion**

This study estimates that 8.2% of the total study participants were current cigarette smokers. Males were significantly more likely to be smokers than females (10.4% versus 6.2%). This male predominance also been reported in other settings<sup>17,18</sup> but the gender disparity in smoking prevalence is not universal. The Global Youth Tobacco Survey Collaborating Group has reported on smoking prevalence from 120 sites across the globe.<sup>14</sup> In 61 of the 120 sites, there was no gender differences in the prevalence of tobacco use.

The overall prevalence estimate obtained from our study is higher than the 5.3% prevalence reported by Mpabulungi and Muula for school-going adolescents in the Kampala, Global Youth Tobacco Survey conducted in 2002.<sup>17</sup> However, the Kafue estimates are much lower than the 21.9% current

Table 4. Factors associated with smoking among males

Factor	Total n (%)	OR (95%CI)
Grade		
7	317 40 (12.6)	1.31 (0.92, 1.89)
8	292 18 (6.2)	0.57 (0.38, 0.86)
9	277 33 (11.9)	1
Received pocket money		
Yes	143 45 (31.5)	2.30 (1.75, 3.03)
No	736 47 (6.4)	1
Had seen advertisements for cigarettes on billboards		
Yes	470 62 (13.2)	-
No	378 28 (7.4)	-
Had something such as a t-shirt or pen with a cigarette brand logo on it		
Yes	155 29 (18.7)	1.47 (1.10, 1.98)
No	692 56 (8.1)	1
Had seen anti-smoking messages at social gatherings		
Yes	362 58 (16.0)	516 34 (6.6)
No	516 34 (6.6)	1
Had seen anti-smoking media messages during the past 30 days		
Yes	599 72 (12.0)	-
No	279 18 (6.5)	-
Parents smoked cigarettes		
Yes	267 49 (18.4)	1.51 (1.15, 1.97)
No	621 42 (6.8)	1
Closest friends smoked cigarettes		
Yes	256 58 (22.7)	1.74 (1.34, 2.27)
No	626 35 (5.6)	1
Smoking cigarettes makes boys look more or less attractive		
Yes	209 26 (12.4)	-
No	484 39 (8.1)	-
Smoking cigarettes is less dangerous for young people because they can always stop later		
Yes	367 52 (14.2)	-
No	507 39 (7.7)	-

cigarette smoking prevalence estimated in Arua, Uganda in 2002.<sup>18</sup> Arua is in the tobacco growing region in Uganda, so it has been suggested that society is more tolerant of adolescent smoking than may be the case in Kampala. Tobacco was marginally grown in Kafue and its population may not have been tolerant of adolescents smoking.

The proportion of girls smoking greater than 6 cigarettes per day was higher than the percentage in males. The reasons for such gender disparity is currently unclear to us.

We found that the majority of adolescent smokers smoked either at home or at a friends' house. This suggests the potential influence of the home environment and peer factors in supporting adolescent smokers. Interventions to prevent adolescent smoking should seriously consider the locations at which adolescents smoke.

The odds of smoking among adolescents who reported having some pocket money was 2.3 compared to those who reported none. Mohan et al who studied adolescent boys in

Table 5. Factors associated with smoking among females

Factor	Total n (%)	OR (95%CI)
Grade		
7	386 39 (10.1)	1.94 (1.26, 2.99)
8	303 10 (3.3)	0.66 (0.38, 1.15)
9	281 12 (4.3)	1
Received pocket money		
Yes	120 29 (24.2)	2.41 (1.72, 3.37)
No	848 30 (3.5)	1
Had seen advertisements for cigarettes at social gatherings		
Yes	352 38 (10.8)	1.52 (1.10, 2.09)
No	612 23 (3.8)	1
Had something such as a t-shirt or pen with a cigarette brand logo on it		
Yes	150 21 (14.0)	-
No	799 38 (4.8)	-
Had seen anti-smoking messages at social gatherings		
Yes	399 39 (9.8)	-
No	573 21 (3.7)	-
Smoking makes one gain or lose weight		
Gain weight	112 11 (9.8)	-
Lose weight	664 31 (4.7)	-
No difference	189 16 (8.5)	-
Parents smoked cigarettes		
Yes	269 37 (13.8)	1.63 (1.17, 2.27)
No	710 24 (3.4)	1
Closest friends smoked cigarettes		
Yes	239 37 (15.5)	1.72 (1.23, 2.40)
No	733 22 (3.0)	1

Kerala, India have also reported a higher likelihood of being a smoker among those receiving pocket money compared to not receiving any pocket money.<sup>19</sup> It is likely that having some disposable cash influences adolescents to spend the money on tobacco.

As has been consistently demonstrated elsewhere, parental and peer smoking were associated with current smoking status among adolescents.<sup>19-23</sup> Due to the cross sectional nature of this study however, we were unable to determine whether having a friend acted as an influence to initiate smoking or whether an adolescent smoker selects other adolescents who smoke as friends.<sup>24</sup> We suspect though that both mechanisms are plausible.

We also found that both girls and boys who reported having seen pro-tobacco advertisements at social gatherings were more likely to be current smokers than those who had not seen advertisements. The role of pro-tobacco advertisements has been studied extensively<sup>25-27</sup>. Evidence suggests that having been exposed to favourable tobacco advertisements is an important risk factor for adolescent smoking. Interestingly also, exposure to anti-tobacco television programs sponsored by tobacco firms have been identified as a risk factor for adolescent smoking<sup>28</sup>. The programming of either anti- or pro-tobacco advertisements is especially a delicate issues in the tobacco prevention arena.

Our study has several limitations. Firstly, due to the cross sectional nature of the design, the factors that have been identified as associated with current cigarette smoking cannot be described in causative terms<sup>29-31</sup>. The study also recruited only school going adolescents in the study area. The findings may therefore be representative of the in-school adolescents in Kafue but not those out of school adolescents. Also, history of current smoking was by self-report. We did not validate the self-reports with biomarkers such as exhaled carbon monoxide or hair or blood cotinine level to assess exposure to cigarettes<sup>32-34</sup>. However, the study utilised standardised methodology that has been used to estimate tobacco use across the globe. This fact allows for meaningful comparisons to be made between different settings both within the same country and without.

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