TOBACCO USE AMONG ADOLESCENTS AT SCHOOL AND OUT-OF-SCHOOL IN MEDELLIN, COLOMBIA. A POPULATION SURVEY.

CONSUMO DE TABACO ENTRE JÓVENES ESCOLARIZADOS Y NO ESCOLARIZADOS EN MEDELLÍN. COLOMBIA. UN ESTUDIO POBLACIONAL.

Alexandra Restrepo, MD, MSci[1] , Nilton E. Montoya, BA[1 2]

Background:
Tobacco use among adolescents is a problematic risk behavior with early age of onset and consequences in health outcomes in adulthood. Objectives: Estimate the prevalence of tobacco use among adolescents at school and off school. Methods: A community-base cross sectional study was conducted during 2007 to estimate the prevalence of tobacco consumption in adolescents aged 12-15 (n=1.998), school and off school. A multistage probability sampling was conducted. Results: Life prevalence of tobacco consumption was 26.8% and currently use tobacco was 6%, the age onset was 11 years; non-enrolled in school adolescents had higher smoking rates. Majority of current smokers were able to buy cigarettes. Conclusion: Non-enrolled adolescents have more risk to tobacco use. Public policies should generate strategies to intervene this population. It is important to conduct the Global Youth Tobacco Survey in a national sample of adolescents including of school adolescents and establish an epidemiological surveillance system of risk behaviors based on surveys conducted periodically.

Key words: Tobacco, adolescent, cross-sectional studies, prevalence.

Antecedentes:
El consumo de tabaco entre los adolescentes es un comportamiento de riesgo problemática para la salud, de inicio cada vez mas temprano y afecta los resultados de salud. Objetivo: Estimar la prevalencia de consumo de tabaco entre los adolescentes escolarizados y no escolarizados. Métodos: Estudio transversal de base poblacional en 2007 para estimar la prevalencia de consumo de tabaco en adolescentes de 12-15 (n = 1.998), escolarizado y no escolarizados. Se uso muestreo probabilístico pilietápico. Resultados: La prevalencia en vida de consumo de tabaco fue del 26,8% y el consumo actual de tabaco fue del 6%, la aparición de edad fue de 11 años; no inscrito en adolescentes escolares tenían mayores tasas de tabaquismo. La mayoría de los fumadores actuales fueron capaces de comprar cigarrillos. Conclusión: los adolescentes no escolarizados tuvieron más riesgo para el consumo de tabaco. Las políticas públicas deben intervenir la población no-escolarizadas. Es importante llevar a cabo la Encuesta Mundial de Tabaquismo en Jóvenes en una muestra nacional que incluya adolescentes incluyendo escolarizados y no escolarizados y establecer un sistema de vigilancia epidemiológica de las conductas de riesgo en base a encuestas realizadas periódicamente.

Palabras claves: tabaco, adolescentes, estudios transversales, prevalencia

1 Professor. Violence and risk behaviors research, Epidemiology research group, National School of Public health, Universidad of Antioquia, Colombia Address: Calle 62 51 – 59, of 214. Medellin, Colombia. Phone: (574)2196856. Fax: (574) 2196868. E-mail: alexandra.restrepo@udea.edu.co

2 Professor. Statistics applications and public health, National School of Public Health, Universidad of Antioquia. Colombia.

Introduction

The effects of tobacco smoking have been widely documented [1]. The World Report on the Global Tobacco Epidemic [2], states that "tobacco is the single most preventable cause of death in the world today", and that "tobacco kills a third to half of all people who use it, on average, 15 years prematurely" [2].

One out of two adolescents that become established smokers will eventually die of a smoking related disease [1].

It has been found that adolescents and young people who smoke are more likely to have other health risks, such as aggression, alcohol abuse, unsafe sex and school failure [3-7]. This link may be due to some behaviors being a direct or indirect cause of subsequent behaviors, or that some are subject to common risk factors [8-16].

In spite of the mounting scientific evidence of the harmful effects of tobacco, consumption is on the increase for many groups, reaching the proportions of a global epidemic beginning with young consumers. It is estimated that approximately 1.1 billion people in the world today are smokers and this figure is expected increase to 1.6 billion by 2025 [17]. About 80% of the world's smokers live in low-income and middle-income countries [17-20] and by 2020 tobacco use will claim about 10 million lives annually; 70% of these deaths will be in poor countries [17, 21] as tobacco use is rapidly taking an increased toll in these parts of the world.

Medellin is the second largest city of Colombia, with 2.3 million inhabitants, and is the capital city of Antioquia State. Adolescents (12 -19 years of age) represent 7% of its population [22]. In the first national survey on psychoactive substances use carried out in Colombia in 1992 [23], was established that the majority of smokers in Colombia had started consumption between the ages of 12 and 17, and that the proportion of consumers 12 to 60 years old who had started before the age of 12 was 7.8 per cent [23]. The second national survey on psychoactive substances in Colombia in 1996 [24] showed that the 1-year and 30-day prevalence of smoking among the 12-17 age group were 7 per cent and 4 per cent, respectively. The 30-day and 1-year prevalence were 18.7 per cent and 14.7 per cent for the 18-24 age group.

In Colombia the percentage of people current tobacco consumers decreased from 1992 to 1998 by 11% in the general population, but it has increased among teenagers by 49%. Tobacco use in Antioquia State is largely higher than in the rest of the country [25]. One study among adolsecentes that attend to school in Antioquia State (2007) found that 35.7% of respondents had smoked in the life and that 20.5% had smoked in past year. Women were less likely than men to report having smoked at some point in their lives (30% and 43%, respectively) [26].

A randomized study of school attending adolescents conducted in Medellin in 2007 found that 48% of respondents had smoked cigarettes during their lifetime and 29% had smoked in the last year. The proportion of men who had smoked cigarettes during their lifetime was greater than that of women (56% and 41%, respectively), and 75% of respondents began smoking before age 14 [27].

In Colombia, three surveys have been conducted with adolescents attending school based on the parameters of the Global Youth Tobacco Survey, one in Bogotá in 2002 [28], in five other Colombian cities [29], and the current study conducted in Medellin, which includes adolescents in school and out-of-school.

Methods

This is a cross-sectional study designed to estimate the prevalence and distribution of tobacco consumption in adolescents aged 12-15 years in Medellin, Colombia.

Sample selection

Representative sample of the urban non-institutionalized adolescent population aged 12-15 years (n=2.000) and used a multi-stage stratified probabilistic sampling approach based on four sampling units: 1) Neighborhood: selected at random from current governmental maps. 3) Household: an inventory of all households was carried out for each of the selected blocks. Twenty-five households were randomly selected from each block. 4) Individual: A census of each of the families residing at the twenty-five houses selected in the previous stage was carried out. Interviews were targeted at adolescents aged 12-15 years present in the households. If a particular household had two or more individuals aged 12-15, the interview respondent was selected at random. When there were no individuals belonging to the 12-15 year age group, a new household was selected at random until there were no remaining households on the block with eligible respondents. If this was still not sufficient to meet the sampling requirements, a new block was randomly selected and the household sampling process was repeated.

The questionnaire

There was used the Spanish version of Global Youth Tobacco Survey questionnaire [30].

Survey administration procedures

Before beginning the survey, a community awareness campaign was conducted in order to properly explain the nature of the study, its objectives, the institutions involved, and the time frame.

Interviews were carried out face-to-face with permission of either the adolescent's parent or a responsible adult. Both the adult and the child were presented the informed consent form, which was approved by the Research Ethics Committee of the Colombian Association of Health. The parent or responsible adult was provided with a copy of the questionnaire so that he or she would be familiar with the questions which would be asked of the adolescent. Researchers took extra care to conduct interviews in settings that would afford the most individual privacy to the respondent, with only the interviewer and interviewee present. The respondent was reminded of their right to refuse to answer any individual questions, as well as their right to voluntarily terminate the interview at any time. Up to five home visits were done to accomplish a survey.

Supervisors were responsible for reviewing each of the completed surveys on a daily basis. In the event a survey was found to be incorrectly administered, the supervisor returned the survey to the interviewer with instructions to re-contact the respondent and properly collect the information needed. Supervisors also conducted surprise visits during the completion of the interviews and were also responsible for verifying ten percent (10%) of the interviews by completing a second visit. In addition, ten percent (10%) of the completed interviews were selected at random in order to verify by telephone that the interview had indeed been carried out by the designated interviewers asking about the proper topics.

Completed interviews were entered into software designed specifically for the study to perform validity checks on the information collected and entered. In the event errors were detected, the individual responsible for data entry registered the error and the survey was passed to a second interviewer, who was then responsible for completing the missing or implausible information.

Results

The response rate was of 99%, 1,998 adolescents were interviewed, of which 55% were female, 6% were not at school, among those attending school 13% were in primary school, 87% were in secondary school, and 43% reported belonging to low socio-economic strata, 44% to middle socio-economic strata

Prevalence ever smoked cigarettes

A quarter of adolescents aged 12-15 years report having smoked at least once during their lifetime, and this rate was higher among males (29%) than among females (25%) (p-value=0.018). The prevalence of ever having consumed tobacco was similar across socio-economic strata. Additionally, twenty-three percent (23%) of adolescents reported having consumed tobacco both during lifetime and also during past month, with no significant difference between males and females (p-value=0.8667), this rate was found to vary inversely with socio-economic stratum (p-value=0.0435) (Table 1).

Prevalence of currently tobacco consumption (Tobacco consumption during past 30 days)

Prevalence of tobacco consumption during past 30 days was 6% and no differences by sex were found. The prevalence of tobacco consumption during past 30 days was greater among respondents in higher socio-economic strata (Table 1). Less than 1% of respondents reported having consumed tobacco in forms other than cigarettes during past month (Table 1).

Age of initiation

Median age onset of tobacco consumption was 11.7 years, and this median age was slightly higher among women than among men (12.0 years vs. 11.5 years, respectively; p-value=0.0012). Respondents belonging to higher socio-economic strata reported a higher mean age of initiation of tobacco use (12.1 years) (Table 1).

Smoking prevalence in non enrolled adolescents

The prevalence of adolescents reporting having ever smoked cigarettes was twice as high among non-enrolled adolescents (52%) than among those who were enrolled (25%) (P-value=0.000). Prevalence of currently tobacco consumption was four times greater among non-enrolled adolescents than among those who were currently enrolled (P-value=0.000) (Table 1).

The proportion of enrolled adolescents that reported having ever smoked in addition to having smoked during the last 30 days was four times greater among non-enrolled adolescents than among those who were enrolled (P-value=0.000) (Table 1).

Average age of initiation of cigarette consumption was similar between enrolled and non-enrolled adolescents (P-value=0.6886; Table 1).

Variable	Statistic	Total	Sex		P-value	Socio-economic stratum			P-value	At school	Off school	P-value
			Male	Female		Low	Middle	High				
Has ever smoked	P	26.8	29.4	24.7	0.0183	28.8	24.1	30.0	0.5570	25.0	52.2	0.0000 a
	95% CI	(24.9 – 28.8) n=1997	(26.4 – 32.5) n=900	(22.2 – 27.4) n=1097	a	(25.7 – 32.0) n=827	(21.3 – 27.1) n=854	(24.4 – 36.1) n=252	b	(23.0 - 27.0) n=1852	(43.0 - 61.3) n=122	
Current cigarillo smoking (Has smoked during past 30 days)	P	6,2	6.9	5,6	0.2678	8.1	4.2	6.2	0.0303	5.0	24.0	0.0000 a
	95% CI	(5.2 – 7.3) n=1997	(5.3 – 8.7) n=900	(4.3 – 7.2) n=1097	a	(6.3 – 10.1) n=827	(3.0 – 5.8) n=854	(3.6 – 10.0) n=252	b	(4.1 - 6.1) n=1852	(16.7 - 32.6) n=122	
Proportion of adolescents that have ever smoked and smoked during past 30 days	P	23.2	23.6	22.9	0.8667	28.0	17.8	20.7	0.0435	5.0	24.0	0.0000 a
	95% CI	(19.7 – 27.1) n=531	(18.5 – 29.2) n=261	(18.0 – 28.4) n=270	a	(22.4 – 34.1) n=238	(12.8 – 23.7) n=204	(12.2 – 31.6) n=75	b	(4.1 - 6.1) n=1852	(16.7 - 32.6) n=122	
Age of initiation, among those having smoked in past 30 days	Mean	11,7	11.5	11.9	0.0127d	11.7	11.6	12.1	0.0338	11.7	11.6	0.6886 d
	95% CI	(11.53 – 11.89) n=523	(11.22 – 11.74) n=259	(11.69 – 12.19) n=264		(11.4 – 12.0) n=234	(11.3 – 12.0) n=201	(11.7 – 12.5) n=73	e	(11.5 - 11.9) n=451	(11.1 - 12.2) n=64	
Prevalence of tobacco consumption in forms other than cigarettes (past 30 days)	P	0.8	1,1	0.5	0.1548	1.1	0.7	NA	NA	0.6	3.2	0.1012 a
	95% CI	(0.4 – 1.3) n=1997	(0.5 – 2.0) n=900	(0.2 – 1.2) n=1097	a	(0.5 – 2.0) n=827	(0.2 – 1.5) n=854	NA		(0.3 - 1.0) n=1863	(0.9 - 7.9) n=126	

a Two proportions Z test b. Chi of n proportions d. U Man-Whitney test e. Kruskal-Wallis test NA = Not applicable

Frequency of cigarette consumption

Adolescents who reported having smoked during past month indicated smoking an average of 10.2 days per month corresponding to approximately 66 cigarettes/month on average. Men reported consuming twice as many cigarettes per month (87%) as women (44%) (P-value=0.1149). There were no significant differences in number of cigarettes smoked per month across socio-economic strata (Table 2). Adolescents attending school smoke on average 9 cigarette/days in the past month and out –of- school on average of 14 cigarette/days (p value=0,033). Enrolled and non-enrolled in the school consume an average of 70-72 cigarettes per month. Approximately 80% of adolescents that reported having smoked during past 30 days indicated that they neither smoke nor have the urge to smoke in the morning and 4% indicated having a regular urge to smoke immediately upon waking. There were no significant differences in these proportions either by sex, by socio-economic stratum, or by school enrollment (Table 2).

Access to cigarettes

Approximately 60% of current tobacco adolescent smokers indicated having obtained cigarettes from a corner shop or street vendor, another 24% obtained them through a friend, an additional 3% indicated that they gave money to a third party to purchase them, and 2% reported having stolen them. Men were more likely (75%) to purchase cigarettes in a corner store than women (49%) (P-value=0.000); however, no other significant differences were observed in patterns of acquiring cigarettes by sex, socio-economic stratum, or school attendance (Table 2).

Some 70% of respondents indicated that nobody had denied selling them cigarettes on account of their age, with no significant differences between sex, but non-enrolled in school were denied in a lower proportion than enrolled ones (p value 0,004) (Table 2).

Approximately 17% of current adolescent smokers indicated having purchased cigarettes by the pack, paying an average of 1,830 pesos (US$0.87) per pack and approximately 80% of respondents indicated buying individual cigarettes, and this proportion was higher among men (89%) than among women (72%) (P-value=0.0012) (Table 2).

Adolescents paid an average of US$0.06 per individual cigarette and reported spending an average of US$0.88 on cigarettes during past month. Re

Table 2. Frequency of tobacco consumption, access to and cost of cigarettes among adolescents aged 12-15 years that smoked in the last 30 days, by sex. Medellin, Colombia

Variable	Statistic	Total	Sex		P-value	Socio-economic stratum			P-value	At school	Off school	P-value
			Male	Female		Low	Middle	High				
Average days in which tobacco consumed in the last month	Mean	10.2	10.6	9.8	0.6994	9.7	10.9	11.5	0.5852	8,9	14,2	0.0338 d
	95% CI	(8.11 – 12.24)	(7.67 – 13.5)	(6.85 – 12.69)	d	(6.98 – 12.49)	(7.08 – 14.69)	(4.94 – 18.15)	e	(6.7 - 11.2)	(9.6 - 18.8)	
		n=124	n=62	n=62		n=67	n=36	n=16		93	29	
Cigarettes/month	Mean	65.8	87.4	44.1	0.1149	53.1	95.0	50.4	0,303	72,1	70,3	0.0761 d
	95% CI	(38.9 – 92.5)	(38.4 – 136.4)	(23.1 – 64.9)	d	(30.3 – 75.7)	(20.4 – 169.6)	(5.2 – 95.6)	e	(71.2 - 73.0)	(68.2 - 72.4)	
Smokes or has the urge to smoke immediately upon waking (among those who smoked in the last 30 days)	Never smokes nor has the urge to smoke immediately upon waking	79.8	82.2	77.3	0.5151c	82.8	70.0	86.0	0.6726c	81.7	77.2	0,23297844c
		(70.8 – 87.1)	(69.1 – 91.5)	(63.2 – 88.1)		(70.3 – 91.6)	(49.0 – 86.5)	(58.3 – 98.3)		(71.3 - 89.6)	(55.9 - 91.6)	
	Occasionally smokes or has the urge to smoke upon waking	16.0	14.6	17.6		11.1	30.0	8.7		16.0	12.8	
		(9.5 – 24.6)	(6.3 – 27.1)	(8.2 – 31.2)		(4.2 – 22.5)	(13.5 – 51.0)	(0.2 – 35.9)		(8.6 - 26.2)	(2.7 - 32.5)	
	Always smokes or has the urge to smoke immediately upon waking	4.1	3.3	5.0		6.1	NA	5.3		2.2	10.0	
		(1.1 – 10.1)	(0.2 – 12.5)	(0.8 – 15.2)		(1.3 – 16.2)		(0.0 – 31.5)		(0.2 - 8.8)	(1.7-28.8)	
	n	103	53	50		57	27	15		77	24	
How did you obtain your cigarettes in the last 30 days?	I bought them from a corner store or street vendor.	62.2	74.9	49.1	0.0004a	60.2	71.8	59.1	0,281b	61.5	64.2	0.8013 a
		(52.8 – 70.9)	(62.0 – 85.2)	(35.8 – 62.6)		(47.0 – 72.4)	(54.4 – 85.6)	(31.7 – 83.1)		(50.6 - 71.7)	(44.4 - 80.9)	
	Los compré de una máquina expendedora	2,6	3	2,3	0,8141a	1,5	3,7	5,4	0,5347b	2.0	4.6	0.5387 a
		(0,5 - 7,5)	(0,2 - 11,4)	(0,1 - 10,6)		(0,0 - 9,3)	(0,1 - 16,7)	(0,0 - 30,9)		(0.1 - 7.8)	(0.1 - 20.2)	
	I gave money to a third party to purchase them.	3.0	1.8	4.1	0.4667a	3.9	3.0	NA	0,8245b	0	12.0	NA
		(0.7 – 7.9)	(0.0 – 9.4)	(0.5 – 13.3)		(0.5 – 12.5)	(0.1 – 15.1)			NA	(3.0 - 29.3)	
	I asked a friend.	23.9	15.7	32.2	0.0466a	27.0	12.4	30.2	0,0519b	25.4	19.3	0.4663 a
		(16.5 – 32.6)	(7.5 – 27.6)	(20.5 – 45.7)		(16.4 – 39.7)	(3.5 – 28.0)	(9.8 – 58.4)		(16.7 - 35.7)	(7.0 - 38.1)	
	I stole them.	2.0	1.6	2.4	0.7465a	NA	6.5	NA	NA	2.6	0	NA
		(0.2 – 6.6)	(0.0 – 9.6)	(0.1 – 10.9)			(0.8 – 20.4)			(0.3 - 8.7)	NA	
	An older person gave them to me.	1.6	1.4	1.9	0.8432a	1.7	NA	5.4	NA	2.2	0	NA
		(0.1 – 6.2)	(0.0 – 9.1)	(0.0 – 9.5)		(0.0 – 9.0)		(0.0 - 30.9)		(0.2 - 8.1)	NA	
	Other means	4.7	1.6	8.0	0.1081a	5.7	2.6	NA	0.4213 b	6.3	0	NA
		(1.7 – 10.3)	(0.0 – 9.6)	(2.4 – 18.2)		(1.4 – 14.7)	(0.0 – 15.4)			(2.2 - 13.6)	NA	
	n	119	60	59		63	36	16		89	29	
Purchase of cigarettes by the pack	P	16.6	17.3	15.9	0.8390a	11.9	22.3	26.9	0.0339b	16.0	18.5	0.7587 a
	95% CI	(10.4 – 24.5)	(8.6 – 29.5)	(7.7 – 27.6)		(5.1 – 22.6)	(9.8 – 39.7)	(7.9 - 55.1)		(9.0 - 25.3)	(6.3 - 37.5)	
	n	119	58	60		63	35	15		89	29	

Variable	Statistic	Total	Sex		P-value	Socio-economic stratum			P-value	At school	Off school	P-value
			Male	Female		Low	Middle	High				
Average days in which tobacco consumed in the last month	Mean	10.2	10.6	9.8	0.6994	9.7	10.9	11.5	0.5852	8,9	14,2	0.0338 d
	95% CI	(8.11 – 12.24)	(7.67 – 13.5)	(6.85 – 12.69)	d	(6.98 – 12.49)	(7.08 – 14.69)	(4.94 – 18.15)	e	(6.7 - 11.2)	(9.6 - 18.8)	
		n=124	n=62	n=62		n=67	n=36	n=16		93	29	
Cigarettes/month	Mean	65.8	87.4	44.1	0.1149	53.1	95.0	50.4	0,303	72,1	70,3	0.0761 d
	95% CI	(38.9 – 92.5)	(38.4 – 136.4)	(23.1 – 64.9)	d	(30.3 – 75.7)	(20.4 – 169.6)	(5.2 – 95.6)	e	(71.2 - 73.0)	(68.2 - 72.4)	
Smokes or has the urge to smoke immediately upon waking (among those who smoked in the last 30 days)	Never smokes nor has the urge to smoke immedi-ately upon waking	79.8 (70.8 – 87.1)	82.2 (69.1 – 91.5)	77.3 (63.2 – 88.1)	0.5151c	82.8 (70.3 – 91.6)	70.0 (49.0 – 86.5)	86.0 (58.3 – 98.3)	0.6726c	81.7 (71.3 - 89.6)	77.2 (55.9 - 91.6)	0,23297844c
	Occasionally smokes or has the urge to smoke upon waking	16.0 (9.5 – 24.6)	14.6 (6.3 – 27.1)	17.6 (8.2 – 31.2)		11.1 (4.2 – 22.5)	30.0 (13.5 – 51.0)	8.7 (0.2 – 35.9)		16.0 (8.6 - 26.2)	12.8 (2.7 - 32.5)	
	Always smokes or has the urge to smoke immedi-ately upon waking	4.1 (1.1 – 10.1)	3.3 (0.2 – 12.5)	5.0 (0.8 – 15.2)		6.1 (1.3 – 16.2)	NA	5.3 (0.0 – 31.5)		2.2 (0.2 - 8.8)	10.0 (1.7-28.8)	
	n	103	53	50		57	27	15		77	24	
How did you obtain your cigarettes in the last 30 days?	I bought them from a corner store or street vendor.	62.2 (52.8 – 70.9)	74.9 (62.0 – 85.2)	49.1 (35.8 – 62.6)	0.0004a	60.2 (47.0 – 72.4)	71.8 (54.4 – 85.6)	59.1 (31.7 – 83.1)	0,281b	61.5 (50.6 - 71.7)	64.2 (44.4 - 80.9)	0.8013 a
	Los compré de una máquina expendedora	2,6 (0,5 - 7,5)	3 (0,2 - 11,4)	2,3 (0,1 - 10,6)	0,8141a	1,5 (0,0 - 9,3)	3,7 (0,1 - 16,7)	5,4 (0,0 - 30,9)	0,5347b	2.0 (0.1 - 7.8)	4.6 (0.1 - 20.2)	0.5387 a
	I gave money to a third party to purchase them.	3.0 (0.7 – 7.9)	1.8 (0.0 – 9.4)	4.1 (0.5 – 13.3)	0.4667a	3.9 (0.5 – 12.5)	3.0 (0.1 – 15.1)	NA	0,8245b	0 NA	12.0 (3.0 - 29.3)	NA
	I asked a friend.	23.9 (16.5 – 32.6)	15.7 (7.5 – 27.6)	32.2 (20.5 – 45.7)	0.0466a	27.0 (16.4 – 39.7)	12.4 (3.5 – 28.0)	30.2 (9.8 – 58.4)	0,0519b	25.4 (16.7 - 35.7)	19.3 (7.0 - 38.1)	0.4663 a
	I stole them.	2.0 (0.2 – 6.6)	1.6 (0.0 – 9.6)	2.4 (0.1 – 10.9)	0.7465a	NA	6.5 (0.8 – 20.4)	NA	NA	2.6 (0.3 - 8.7)	0 NA	NA
	An older person gave them to me.	1.6 (0.1 – 6.2)	1.4 (0.0 – 9.1)	1.9 (0.0 – 9.5)	0.8432a	1.7 (0.0 – 9.0)	NA	5.4 (0.0 - 30.9)	NA	2.2 (0.2 - 8.1)	0 NA	NA
	Other means	4.7 (1.7 – 10.3)	1.6 (0.0 – 9.6)	8.0 (2.4 – 18.2)	0.1081a	5.7 (1.4 – 14.7)	2.6 (0.0 – 15.4)	NA	0.4213 b	6.3 (2.2 - 13.6)	0 NA	NA
	n	119	60	59		63	36	16		89	29	
Purchase of cigarettes by the pack	P	16.6	17.3	15.9	0.8390a	11.9	22.3	26.9	0.0339b	16.0	18.5	0.7587 a
	95% CI	(10.4 – 24.5)	(8.6 – 29.5)	(7.7 – 27.6)		(5.1 – 22.6)	(9.8 – 39.7)	(7.9 - 55.1)		(9.0 - 25.3)	(6.3 - 37.5)	
	n	119	58	60		63	35	15		89	29	

a Two proportions Z test
b. Chi of n proportions
c.Chi-square test of association
d. U Man-Whitney test
e. Kruskal-Wallis test
NA = Not applicable

spondents indicated spending an average of 12% of their income on cigarettes. This percentage was roughly similar between males and females, but almost double among adolescents off school ones (22%) (p value= 0,001) (Table 2).

Places of consumption

Around half of current adolescent smokers indicated having done so in public places. Another 20% reported having smoked at parties, social events, or at home. The type of places where adolescents were most likely to smoke was not significantly different by sex. Nodifferences were found among adolescent at school and off school and place of smoking (Table 3).

Attitudes and awareness with respect to cigarette smoking

Four-fifths of adolescents that have never smoked, regardless of sex, indicated that were they to be offered a cigarette by a friend, they would definitely refuse (Table 4).

When non-smoking respondents were asked about the likelihood of smoking within the coming year, more than eight in ten respondents stated that they definitely would not smoke in the next twelve months and 4% responded that they probably or definitely would smoke during coming year (Table 4).

Nearly 80% of non-smoking respondents indicated that they would not smoke in the next five years, and 5% showed some degree of likelihood of smoking within the next five years. A greater proportion school attendance youth reported that they would probably be smoking in five years (Table 4).

Nearly half of adolescents consider it difficult to stop smoking once one starts, while more than a fifth felt that it would probably be difficult to stop, and an equal proportion believed that one would have no

Table 3. Percent distribution of place of consumption of cigarettes during past 30 days among adolescents aged 12-15 years. Medellin, Colombia

Variable	Statistic	Total	Sex		P-value	At school	Off school	P-value
			Male	Female				
Public places (streets, parks, shopping centers, etc.)	P	47.9	48.1	47.7	0.9666	51,6	41,4	0,298
	95% CI	(38.9 - 57.0)	(35.4 - 61.0)	(34.8 - 60.9)	a	(41,0 - 62,1) n=93	(23,5 - 61,1)	a
	n	26	n=64	n=61		93	29	
Parties and social events	P	22.6	24.9	20.3	0.5302	24,7	17,2	0,351
	95% CI	(15.6 - 30.9)	(14.8 - 37.3)	(11.1 - 32.4)	a	(16,4 - 34,8) n=93	(5,8 - 35,8)	a
	n	126	64	61		93	29	
Home	P	20.5	15.5	25.7	0.1683	15,1	37,9	0,041
	95% CI	(13.8 - 28.7)	(7.5 - 26.8)	(15.4 - 38.5)	a	(8,5 - 24,0) n=93	(20,7 - 57,7)	a
	n	126	64	61		93	29	
Friends home	P	16.1	18.7	13.4	0.4043	14	24,1	0,272
	95% CI	(10.1 - 23.8)	(10.1 - 30.5)	(6.0 - 24.6)	a	(7,7 - 22,7) n=93	(10,3 - 43,5)	a
	n	126	64	61		93	29	
Other places	P	7.3	10.8	3.6	0.1103	6,5	10,3	0,547
	95% CI	(3.4 - 13.3)	(4.3 - 21.3)	(0.4 - 12.0)	a	(2,4 - 13,5) n=93	(2,2 - 27,4)	a
	n	126	64	61		93	29	
School	P	4.2	4.2	4.3	0.9843	5,4	0	0,021
	95% CI	(1.4 - 9.5)	(0.7 - 12.6)	(0.7 - 12.8)	a	(1,8 - 12,1) n=93	NA	a
	n	126	64	61		93	29	
Work	P	1.4	2.8	0	0.167	2,2	0	0,148
	95% CI	(0.1 - 5.5)	(0.2 - 10.6)	NA	a	(0,3 - 7,6) n=93	NA	a
	n	126	64			93	29	
No answer	P	4.3	5.3	3.3	0.588	2,2	0	0,148
	95% CI	(1.4 - 9.7)	(1.1 - 14.2)	(0.4 - 11.4)	a	(0,3 - 7,6) n=93	NA	a
	n	126	64	61		93	29	

a= Two proportions Z test

difficulty in stopping smoking (Table 4).

Perceived ability to quit smoking

Almost all of respondents that had smoked within the last month were confident that they would be able to quit smoking without difficulties. Almost half of adolescents that reported having smoked in the last month indicated that they had not received any help or advice with respect to quitting smoking, and one-third had received support from someone in their family. A greater proportion adolescents out-of-school perceive that they would not find it difficult to stop smoking once started compared to adolescents that attended to school (Table 4).

Exposure to advertising

Table 5 shows exposure to tobacco advertising. Around one quarter or a fifth of adolescents indicated that they had not heard or saw any anti-tobacco messages in the last month at radio, TV, magazines, or posters, while half of them indicated having heard or saw a few anti-tobacco messages, and one quarter were exposed to many. There were no significant differences by sex or socio-economic stratum. Adolescents reported similar percentages of having been exposed to tobacco promotional messages (one quarter: no; half: "few" messages, and one quarter "many" messages) in streets and public places, magazines and other periodicals, and at sport and cultural events. There were no significant differences observed between males and females in this respect; however, adolescents of lower socio-economic strata were more likely to report having "never" seen these types of advertising (Table 5). Adolescents off school reported more frequently to not have seen anti-tobacco propaganda messages on radio and television, sporting events, festivals and concerts. They also more frequently referred to not have seen pro-tobacco advertising in magazines or newspapers, sporting events or TV shows compared to adolescents that attended to school.

Education regarding the harmful effects of tobacco

Eight out of ten adolescents indicated having received information from family members regarding the harmful effects of tobacco. Men were more likely than women to report having received information from family members (80.5% versus 76.7%), and respondents from higher socio-economic strata were more likely to have received information on the risks associated with tobacco use (Table 5).

Nearly 80% of adolescents had been educated during the most recent school year regarding the dangers of smoking. Slightly more than half reported having discussed the reasons why people smoke in one of their classes, and nearly 80% indicated having been taught about the harmful effects of smoking as part of the discussion. There were no significant differences observed in terms of education by sex (Table 5).

Discussion

The Global Youth Tobacco Survey has been conducted in Colombia in Bogotá, (28) in five other cities [29] and now in Medellin. This study was conducted in a sample of the population of adolescents 12 to 15 years in Medellin. Thus it includes adolescents in school as well as those that are out-of-school. To our knowledge this is the first study in Colombia that reaches out to include out-of-school adolescents, which present much higher rates of tobacco use compared to those attending school.

In Medellin, prevalence of tobacco consumption in life has been reported to be higher than those found in this study. Such differences could be explained given that those questionnaires were conducted with different age ranges and with different methodologies and surveys. The prevalence of tobacco consumption in life and current tobacco use in the adolescents that attended in Medellin was significantly lower compared with other report to school attending adolescents in Medellin [27], and five out of six other Colombian cities [28, 29]. Current and lifetime proportions of cigarette smokers are significantly higher among adolescents out-of-school than among those that attended to school.

In Medellin, prevalence of tobacco consumption in life has been reported to be higher than those found in this study. Such differences could be explained given that those questionnaires were conducted with different age ranges and with different methodologies and surveys. The prevalence of tobacco consumption in life and current tobacco use in the adolescents enrolled in school in Medellin was significantly lower compared with other reports to school attending adolescents in Medellin [27], and five out of six other Colombian cities [28, 29]. Current and lifetime proportions of cigarette smokers are significantly higher among off school adolescents than among adolescents that attended to school.

In the present study the prevalence of smoking in the past 30 days was found to be similar between men and women. This behaviour has also been reported in Colombia [28, 31] and the Americas [32]. In countries like Uruguay and Argentina the prevalence of tobacco consumption in the last month is

Table 4. Attitudes toward smoking among adolescents aged 12-15 years that smoked in past month. Rate per 100, (95% CI). Medellin, Colombia.

Variable		Total	Sex		P-value	At school	Off school	P-value
			Males	Females				
Would you smoke if one of their best friends offered them a cigarette (among non-smokers)	Definitely not	84.1	85	83,4	0.2066	82	93,2	0,2671c
		(82.1 - 85.9)	(82,0 - 87,8)	(80,6 - 85,9)	c	(79,9 - 84,0)	(83,5 - 98,1)	
	Probably not	11.9	12,1	11,7		12,1	5,1	
		(10.3 - 13.7)	(9,6 - 14,9)	(9,6 - 14,1)		(10,4 - 13,9)	(1,1 - 14,1)	
	Yes, probable	3.9	2,9	4,7		4	1,7	
		(3.0 - 5.0)	(1,7 - 4,5)	(3,3 - 6,4)		(3,0 - 5,1)	(0,0 - 9,1)	
	Yes, definitely	0.1	0.0	0,2		0,1	0	
		(0.0 - 0.5)	NA	(0,0 - 0,9)		(0,0 - 0,5)	NA	
	n	1436	622	812		1388	59	
Will you smoke a cigarette at some point in the next 12 months (among non-smokers)	Definitely not	79.4	79,3	79,6	0.7737	77,3	78	0,0585c
		(77.2 - 81.5)	(75,9 - 82,5)	(76,6 - 82,3)	c	(75,0 - 79,5)	(65,3 - 87,7)	
	Probably not	15.5	15,9	15,2		15,4	10,2	
		(13.6 - 17.5)	(13,1 - 19,1)	(12,8 - 17,9)		(13,5 - 17,4)	(3,8 - 20,8)	
	Yes, probable	4.6	4,2	5.0		4,2	10,2	
		(3.6 - 5.9)	(2,8 - 6,1)	(3,6 - 6,7)		(3,2 - 5,4)	(3,8 - 20,8)	
	Yes, definitely	0.4	0,5	0,2		0,4	1,7	
		(0.2 - 0.9)	(0,1 - 1,4)	(0,0 - 0,9)		(0,1 - 0,8)	(0,0 - 9,1)	
		1420	615	803		1386	59	
Will you be smoking cigarettes 5 years from now (among non-smokers)	Definitely not	76.4	75,2	77,5	0.3891	73,5	74,6	0,0391c
		(74.1 - 78.6)	(71,6 - 78,6)	(74,4 - 80,3)	c	(71,1 - 75,8) n=1387	(61,6 - 85,0) n=59	
	Probably not	17.5	19,3	16,1		17,2	11,9	
		(15.5 - 19.6)	(16,2 - 22,6)	(13,6 - 18,8)		(15,2 - 19,2) n=1387	(4,9 - 22,9) n=59	
	Yes, probable	5.6	5.0	6,1		5,1	13,6	
		(4.5 - 6.9)	(3,4 - 7,0)	(4,5 - 8,0)		(4,0 - 6,4) n=1387	(6,0 - 25,0) n=59	
	Yes, definitely	0.5	0,5	0,4		0,5	0	
		(0.2 - 1.0)	(0,1 - 1,4)	(0,1 - 1,1)		(0,2 - 1,0)	NA	
	n	1408	618	790		1387	59	
Believe it would be difficult to stop smoking once they start (among non-smokers)		19.3	20,5	18,4	0.6400	18,3	23,7	0,413
	Definitely not	(17.3 - 21.5)	(17,4 - 23,9)	(15,8 - 21,3)	c	(16,3 - 20,4)	(13,6 - 36,6) n=59	c
	Probably not	8.9	9,5	8,4		8,5	13,6	
		(7.5 - 10.5)	(7,3 - 12,1)	(6,6 - 10,6)		(7,1 - 10,1)	(6,0 - 25,0) n=59	
	Yes, probable	23.0	22,3	23,5		22	22	
		(20.8 - 25.2)	(19,1 - 25,8)	(20,5 - 26,6)		(19,9 - 24,3)	(12,3 - 34,7) n=59	
	Yes, definitely	48.8	47,7	49,7		47,1	40,7	
		(46.2 - 51.5)	(43,7 - 51,8)	(46,1 - 53,2)		(44,5 - 49,8)	(28,1 - 54,3) n=59	
	n	1403	610	793		1390	59	
Would you be able to quit smoking if you wanted? (among those that smoked in the last 30 days)	P	96.1	96,7	95,5		96,3	100	NA
	CI 95%	(90.4 - 98.9)	(87,5 - 99,8)	(85,6 - 99,4)		(89,4 - 99,2)	NA	
	n	108	53	54		80	28	
Have you ever received support or advice for quitting smoking? (among those that smoked in the last 30 days)	Yes, from a program or professional	5.4	8,2	2,5	0.1762	5,5	3,4	0,902
		(1.9 - 11.6)	(2,5 - 18,8)	(0,1 - 11,5)	c	(1,8 - 12,4)	(0,1 - 17,8)	c
	Yes, from a friend	13.7	14,4	13,1		12,1	10,3	
		(7.9 - 21.6)	(6,2 - 26,6)	(5,4 - 25,1)		(6,2 - 20,6)	(2,2 - 27,4)	
	Yes, from a family member	32.2	39,2	25		27,5	34,5	
		(23.6 - 41.8)	(26,3 - 53,3)	(14,2 - 38,7)		(18,6 - 37,8)	(17,9 - 54,3)	
	No, I haven't received any support	48.7	38,2	59,4		44	44,8	
		(39.0 - 58.4)	(25,5 - 52,3)	(45,1 - 72,6)		(33,6 - 54,8)	(26,4 - 64,3)	
	n	109	56	54		91	29	

a Z-test for difference of two proportions **c Chi-square test of association**

Table 5. Exposure to tobacco advertising and to education about the harmful effects of tobacco among adolescents aged 12-15 years. Medellin, Colombia.

Variable	Statistic	Total	Sex		P-value	Enrolled in school	Non-enrolled in school	P-value
			Male	Female				
Anti-tobacco messages on television, radio, billboards, or in periodicals (during past 30 days)	None	23.2	24.1	22.5	0.3783 c	22,5	32,8	0,0330 c
		(21.4 - 25.2)	(21.3 - 27.1)	(20.0 - 25.1)		(20,6 - 24,5)	(24,6 - 41,9)	
	Few	48.1	48.7	47.6		48,5	41,8	
		(45.9 - 50.3)	(45.3 - 52.0)	(44.6 - 50.6)		(46,2 - 50,8)	(32,9 - 51,1)	
	Many	28.7	27.2	29.9		29	25,4	
		(26.7 - 30.7)	(24.3 - 30.2)	(27.2 - 32.7)		(26,9 - 31,1)	(18,0 - 34,1)	
	n	1959	882	1077		1818	122	
Anti-tobacco messages at sporting events, festivals, concerts, or other community and social events (during past 30 days)	Never	22.3	24.3	20.6	0.0211c	24,7	36,1	0,0170 c
		(20.5 - 24.2)	(21.5 - 27.3)	(18.2 - 23.2)		(22,6 - 26,8)	(26,6 - 46,5)	
	Occasionally	51.2	51.7	50.7		58,5	51,5	
		(48.9 - 53.4)	(48.4 - 55.1)	(47.6 - 53.7)		(56,1 - 61,0)	(41,2 - 61,8)	
	Very often	14.4	12.0	16.5		16,8	12,4	
		(12.9 - 16.1)	(9.9 - 14.3)	(14.3 - 18.8)		(15,0 - 18,7)	(6,6 - 20,6)	
	I never attend such events	12.1	11.9	12.3		0	0	
		(10.7 - 13.6)	(9.9 - 14.3)	(10.4 - 14.4)		NA	NA	
	n	1948	879	1069		1805	120	
Frequency of observing actors smoking on television or in films (during past 30 days)	Never	11.7	11.7	11.7	0.5405 c	11,4	18,3	0,0130 c
		(10.3 - 13.2)	(9.7 - 14.0)	(9.9 - 13.8)		(10,0 - 13,0)	(11,9 - 26,4)	
	Occasionally	63.5	64.3	62.8		64,8	52,5	
		(61.3 - 65.6)	(61.1 - 67.5)	(59.9 - 65.7)		(62,5 - 67,0)	(43,2 - 61,7)	
	Very often	23.9	23.4	24.4		23,8	29,2	
		(22.0 - 25.9)	(20.6 - 26.3)	(21.8 - 27.0)		(21,9 - 25,9)	(21,2 - 38,2)	
	I never watch television or films	0.9	0.5	1.1		0	0	
		(0.5 - 1.4)	(0.2 - 1.3)	(0.6 - 1.9)		NA	NA	
	n	1963	884	1078				
Has personal items that promote tobacco (jackets, shirts, pens, backpacks, hats, etc.)	P	4.0	5.1	3.2	0.0429c	3,8	5,7	0,3804 c
	CI	(3.2 - 5.0)	(3.7 - 6.7)	(2.2 - 4.5)		(3,0 - 4,8)	(2,3 - 11,5)	
	n	1963	885	1077		1848	122	
Frequency of observing cigarette advertising on sports or other television programs (during past 30 days)	Never	25.8	24.1	27.2	0.1469 c	25,4	34,5	0,0191 c
		(23.9 - 27.8)	(21.3 - 27.1)	(24.5 - 30.0)		(23,4 - 27,5)	(26,0 - 43,7)	
	Occasionally	52.9	52.7	53.2		54	41,2	
		(50.7 - 55.2)	(49.3 - 56.0)	(50.1 - 56.2)		(51,6 - 56,3)	(32,2 - 50,6)	
	Very often	20.8	22.6	19.3		20,7	24,4	
		(19.0 - 22.7) n=1945	(19.8 - 25.5)	(17.0 - 21.8) n=1065		(18,8 - 22,6) n=1796	(17,0 - 33,1) n=119	
	I never watch television	0.5	0.7	0.3		0	0	
		(0.2 - 0.9)	(0.2 - 1.5)	(0.1 - 0.9)		NA	NA	
	n	1945	880	1065		1796	119	

Variable	Statistic	Total	Sex		P-value	Enrolled in school	Non-enrolled in school	P-value
			Male	Female				
Anti-tobacco messages on television, radio, billboards, or in periodicals (during past 30 days)	None	23.2	24.1	22.5	0.3783 c	22,5	32,8	0,0330 c
		(21.4 - 25.2)	(21.3 - 27.1)	(20.0 - 25.1)		(20,6 - 24,5)	(24,6 - 41,9)	
	Few	48.1	48.7	47.6		48,5	41,8	
		(45.9 - 50.3)	(45.3 - 52.0)	(44.6 - 50.6)		(46,2 - 50,8)	(32,9 - 51,1)	
	Many	28.7	27.2	29.9		29	25,4	
		(26.7 - 30.7)	(24.3 - 30.2)	(27.2 - 32.7)		(26,9 - 31,1)	(18,0 - 34,1)	
	n	1959	882	1077		1818	122	
Anti-tobacco messages at sporting events, festivals, concerts, or other community and social events (during past 30 days)	Never	22.3	24.3	20.6	0.0211c	24,7	36,1	0,0170 c
		(20.5 - 24.2)	(21.5 - 27.3)	(18.2 - 23.2)		(22,6 - 26,8)	(26,6 - 46,5)	
	Occasionally	51.2	51.7	50.7		58,5	51,5	
		(48.9 - 53.4)	(48.4 - 55.1)	(47.6 - 53.7)		(56,1 - 61,0)	(41,2 - 61,8)	
	Very often	14.4	12.0	16.5		16,8	12,4	
		(12.9 - 16.1)	(9.9 - 14.3)	(14.3 - 18.8)		(15,0 - 18,7)	(6,6 - 20,6)	
	I never attend such events	12.1	11.9	12.3		0	0	
		(10.7 - 13.6)	(9.9 - 14.3)	(10.4 - 14.4)		NA	NA	
	n	1948	879	1069		1805	120	
Frequency of observing actors smoking on television or in films (during past 30 days)	Never	11.7	11.7	11.7	0.5405 c	11,4	18,3	0,0130 c
		(10.3 - 13.2)	(9.7 - 14.0)	(9.9 - 13.8)		(10,0 - 13,0)	(11,9 - 26,4)	
	Occasionally	63.5	64.3	62.8		64,8	52,5	
		(61.3 - 65.6)	(61.1 - 67.5)	(59.9 - 65.7)		(62,5 - 67,0)	(43,2 - 61,7)	
	Very often	23.9	23.4	24.4		23,8	29,2	
		(22.0 - 25.9)	(20.6 - 26.3)	(21.8 - 27.0)		(21,9 - 25,9)	(21,2 - 38,2)	
	I never watch television or films	0.9	0.5	1.1		0	0	
		(0.5 - 1.4)	(0.2 - 1.3)	(0.6 - 1.9)		NA	NA	
	n	1963	884	1078				
Has personal items that promote tobacco (jackets, shirts, pens, backpacks, hats, etc.)	P	4.0	5.1	3.2	0.0429c	3,8	5,7	0,3804 c
	CI	(3.2 - 5.0)	(3.7 - 6.7)	(2.2 - 4.5)		(3,0 - 4,8)	(2,3 - 11,5)	
	n	1963	885	1077		1848	122	
Frequency of observing cigarette advertising on sports or other television programs (during past 30 days)	Never	25.8	24.1	27.2	0.1469 c	25,4	34,5	0,0191 c
		(23.9 - 27.8)	(21.3 - 27.1)	(24.5 - 30.0)		(23,4 - 27,5)	(26,0 - 43,7)	
	Occasionally	52.9	52.7	53.2		54	41,2	
		(50.7 - 55.2)	(49.3 - 56.0)	(50.1 - 56.2)		(51,6 - 56,3)	(32,2 - 50,6)	
	Very often	20.8	22.6	19.3		20,7	24,4	
		(19.0 - 22.7) n=1945	(19.8 - 25.5)	(17.0 - 21.8) n=1065		(18,8 - 22,6) n=1796	(17,0 - 33,1) n=119	
	I never watch television	0.5	0.7	0.3		0	0	
		(0.2 - 0.9)	(0.2 - 1.5)	(0.1 - 0.9)		NA	NA	
	n	1945	880	1065		1796	119	

a Two proportions Z test b. Chi of n proportions c.Chi-square test of association d. U Man-Whitney test e. Kruskal-Wallis test
NA = Not applicable

higher in adolescent women [33].

Sixty per cent of adolescents who smoked in the last month reported to have acquired cigarettes in a store or from a street vendor and 70% said no one refused to sell them cigarettes because of their age, which indicates the easy access to cigarettes to minors, despite the fact that such practices are prohibited by law. These findings are similar to those reported from Bogota, Colombia [28].

The proportion of adolescents who smoke at home is very low, as they prefer to smoke in public places. This may be consistent with the belief that smoking

can generate more friends and may one look more attractive [28].

Between 70% and 80% of adolescents were exposed to some form of tobacco publicity. This was a lower proportion compared to those reported in almost all other countries where this survey was conducted [33]. Adolescents that were off school were less exposed to anti-tobacco messages in the media, yet they were also less exposed to pro-tobacco propaganda in magazines or newspapers, at sporting events or TV shows.

Eight out of ten adolescents had received information at least once about the consequences of tobacco use from their families, a greater proportion specifically found in male adolescents and upper class female adolescents. A large proportion of adolescents had not received any type of advice or support coming from any source on smoking cessation.

There are a number of risk behaviors that tend to occur concurrently, or comorbidities, for example, being aggressor, alcohol abuse, tobacco use, drug abuse, unsafe sex and school failure [3-7]. These behaviors manifest mental health problems and are in turn risk factors to main causes of illness and death in Colombia, such as cardiovascular disease, deaths from external causes, road traffic accidents and cancer [34].

This leads to two final thoughts. First it is necessary to do a follow-up or epidemiological surveillance of these risk behaviors. Surveillance systems tend to be focused primarily on diseases or causes of illness and death, but not on risk factors. The causes of morbidity mentioned above, which are present in developing or middle income countries like Colombia, usually have a long latency period and thus it is key to maintain under epidemiological surveillance the main factors associated with these conditions in a causal manner. The surveillance of these risk behaviors should be conducted through a long-term approach because of the time required for such behaviors to manifest themselves and because relevant societal change tends to also take years. Behaviors such as smoking, being aggressor, drug abuse, etc. have a very low reporting rate to the authorities [35]. Thus their surveillance cannot depend on the statistics that are traditionally collected; rather, this should be done through representative population surveys conducted periodically. The University of Antioquia (PREVIVA) in Medellin has undertaken this task, where two of such surveys (in 2003 and 2007) have been completed, with the third to be conducted in 2012. This shows that in a developing country it is possible to implement epidemiological surveillance of risk behaviors through surveys conducted periodically [36-38].

The second point is that, given that the mentioned risk behaviors have a number of common etiologic factors that manifest themselves at an early age [3-7], we must make the effort to design and implement policies and programs on early prevention that are multifaceted, that is, that can have an impact on these different risk behaviors. This would not only prevent mental health problems, which are now the leading cause of healthy years of life lost to disability [39], but could, to a large extent, prevent leading causes of illness death.

Limitations

The main limitation of this study was found on cross-sectional design biases, among which recall bias and self-reporting may specifically affect the figures for prevalence of tobacco consumption.

Acknowledgments

This survey was carried out by the Colombian Association of Health (ASSALUD), thanks to technical and financial support from International Development Research Center of Canada (Contract N°103437-004). The content is solely the responsibility of the authors and does not necessarily represent the official views of IDRC.

Declaration of interest

The authors report no conflicts of interest.

References

1. Sarnet JM. The risk on active and passive smoking. In: P S, editor. Smoking: Risk perception and policy: Sage; 2002. p. 3-29.

2. World Health Organization. Report on the Global Tobacco Epidemic, 2008.The MPOWER Package. Geneva: World Health Organization.; 2008.

3. Eron LE, Gentry JH, Schlegel P. Reason to Hope: A psychosocial perspective on violence and youth. Washington, DC: American Psychological Association; 1996.

4. Farrington DP. Key results from the first forty years of the Cambridge Study in Delinquent Behavior. In: Thornberry, T. P, editor. Taking stock of delinquency: An overview of findings from contemporary longitudinal studies. 137-184. New York: Kluwer Academic/Plenum Publishers; 2003.

5. Huizinga D, Wylie Weither A, Espiritu R, al e. Delinquency and crime: Some highlights from the Denver Youth Study. In: Thornberry T KM, editor. Taking stock of delinquency: An overview of findings from contemporary longitudinal studies. New York: Kluwer Academic/ Plenum Publishers; 2003. p. 47-92.

6. Patterson GR, Capaldi D, Bank L. An Early-Starter Model for Predicting Delinquency. In: Peplar DJ, KH R, editors. Development and Treatment of Childhood Ag-

gression. Hillsdale, NJ: Lawrence Erlbaum; 1991.
7. Reiss AJ, Roth JA. Understanding and preventing violence. Council. NR, editor. Washington, DC1993.
8. Bair-Merritt MH, Blackstone M, Feudtner C. Physical Health Outcomes of Childhood Exposure to Intimate Partner Violence: A Systematic Review. Pediatrics. 2006;117:278-90.
9. Connor DF. Aggression and antisocial behavior in children and adolescents. Research and treatment. New York: Guilford Press.; 2002.
10. Dong M, Anda RF, Felitti VJ, Williamson DF, Dube SR, Brown DW, et al. Childhood Residential Mobility and Multiple Health Risks During Adolescence and Adulthood. The Hidden Role of Adverse Childhood Experiences. Arch Pediatr Adolesc Med. 2005;159:1104-10.
11. Easton A, Kiss E. Covariates of current cigarette smoking among secondary school students in Budapest, Hungary. Health Education Reserch. 1999;20(1):92-100.
12. Jeon HJ, Hahm BJ, Lee HW, et al. Prevalence, Correlates, and Comorbidity of 12-Month Tobacco Dependence among Ever-smokers in South Korea, During 1984. J Korean Med Sci. 2008;23:207-12.
13. Margolin G, Gordis E. The effects of family and community violence on children. Annu Rev Psychol. 2000;51:445-79.
14. Scal P, Ireland M, Wagman Borowsky I. Smoking among American adolescents: A risk and protective factor analysis. J Community Health. 2003;28(2):79-97.
15. Smith-Khuri E, Iachan R, Scheidt PC, Overpeck MD, Gabhainn SN, Pickett W, et al. A Cross-national Study of Violence-Related Behaviors in Adolescents. Arch Pediatr Adolesc Med. 2004;158:539-44.
16. Tercyak KP, Rodríguez D, Aundrain-McGovern J. High School Senior's smoking initiation and progression 1 year after graduation. Am J Public Health. 2007;97:1397-8.
17. The World Bank. Curbing the epidemic: governments and the economics of tobacco control. Washington, DC: The World Bank; 1999.
18. WHO, Research for International Tobacco Control. Confronting the epidemic: A global agenda for tobacco control research. Geneva: WHO; 1999.
19. WHO. The role of health professionals in tobacco control. Geneva, Switzerland.: WHO; 2005.
20. Peto R, Lopez AD. Future worldwide health effects of current smoking patterns. In: C. E. Koop, editor. Critical issues in global health. 154-161. New York: C. Pearson & M. R. Schwarz; 2001.
21. Global Youth Tobacco Survey Collaborating Group. Differences in worldwide tobacco use by gender: Findings from the global youth tobacco survey. J Sch Health. 2003;73(6):207.
22. Departamento Administrativo Nacional de Estadística. DANE. Proyecciones Municipales de población 2005 - 2001. Sexo y grupos de edad. Sitio de internet http://www.dane.gov.co/files/investigaciones/poblacion/proyepobla06_20/p_20052011_Ajustadosgruposedad.xls Consultado: 12 de julio de 2009.
23. Rodríguez E, Duque LF, J. R. El Estudio Nacional sobre Consumo de Sustancias Psicoactivas en Colombia. Bogotá: Ministerio de Justicia, Dirección Nacional de Estupefacientes; 1992.
24. Ministerio de Justicia-Dirección Nacional de Estuperfacientes. Segundo Estudio Nacional sobre Consumo de Sustancias Psicoactivas en Colombia. 1996 Bogotá: Ministerio de Justicia-Dirección Nacional de Estuperfacientes; 1996 [cited 2012 January 12]. Available from: http://www.dne.gov.co/?idcategoria=846&download=Y
25. Parra A, Silva LM, Fagua C, et al. Estudio nacional de consumo de sustancias psicoactivas, 2008. Bogotá: Editora Guadalupe S.A.; 2008.
26. Zapata MA, Segura A. Consumo de suntacias sicoantivas en jóvenes escolarizados del departamento de Antioquia. Investigación comaprativa 2003-2007. Medellín: Gobernación de Antioquia; 2007.
27. Zapata MA, segura A. Consumo de sustancias sicoactivas en jovens escolarizados de la ciudad de Medellín, 2007. Medellín: Alcaldía de Medellín; 2007.
28. Wiesner C, Peñaranda W. Encuesta mundial de tabaquismo en jóvenes Reporte de Bogotá, Colombia. Rev Col Cancerología. 2002;6(4):5-14.
29. Pardo C, Piñeros M. Consumo de tabaco en cinco ciudades de Colombia, Encuesta Mundial de Tabaquismo en Jóvenes, 2007. Biomédica. 2010;30:509-18.
30. CDC. Global Youth Tobacco Survey (GYTS). Questionnaires. Spanish version. [web site] http://www.cdc.gov/tobacco/global/gyts/spanish/questionnaire_es.htm Accessed January 30, 2009. 2007.
31. Pardo C, Piñeros M. Consumo de tabaco en cinco ciudades de Colombia, Encuesta Mundial de Tabaquismo en Jóvenes, 2007. Biomédica.509-18.
32. Mochizuki-Kobayash Y, Fishburn B, Baptiste J, et al. Use of Cigarettes and Other Tobacco Products among Students Aged 13–15 Years — Worldwide, 1999–2005. MMWR. 2006;5(20):553-5.
33. The Global Youth Tobacco Survey Collaborative Group. Tobacco use among youth: a cross country comparison. Tobacco Control. 2002;Tobacco Control(11):252-70.
34. Colombia. Ministerio de la Protección Social. Indicadores básicos de salud de Colombia, 2010. [web site] http://www.minproteccionsocial.gov.co/Documentos%20y%20Publicaciones/Indicadores%20B%C3%A1sicos%202010.pdf Acess: Jan 12, 2012. 2010.
35. Duque LF, Montoya NE, Toro JA. Reporte de hechos violentos en los municipios del Valle de Aburrá. Revista Facultad Nacional de salud Pública. 2007;25(2):48-58.
36. Duque LF. La Violencia en el Valle de Aburra: Su magnitud y programa para reducirla. Universidad de Antioquia y Area Metropolitana del Valle de Aburrá. Medellín: Fotograficas Mario Salazar; 2005. 90-1 p.
37. Duque LF, Motoya N, Roldan P. La violencia en el Valle de Aburá. Caminos para al superación. Second ed. Medellín: Catedrá litográfica; 2009.
38. Duque LF, Restrepo A, Montoya ND. Violencia, alcohol, drogas, tabaco y sexualidad insegura en Medellín y

el Área Metropolitana. Medellín: Revista Facultad Nacional de Salud Pública; 2011.
39. World Health Organization. Years of life lost for discapacity Geneva: World Health Organization,; 2004 [cited 2012 January 10]. Available from: http://www.who.int/entity/healthinfo/global_burden_disease/DALY6_00_2004.xls.