

Tobacco Use Among Students from Romania 2004 versus 2009 GYTS Data

Sorina IRIMIE*, Ileana Maria MIREȘTEAN, Adriana Cosmina SAMOILĂ, Ioana BELDEAN-GALEA, Anamaria DECANOVICI

National Institute of Public Health - Regional Centre for Public Health Cluj, 6 Louis Pasteur, 400349, Cluj-Napoca, Romania.

E-mail: sorina.irimie@gmail.com

* Author to whom correspondence should be addressed; Tel.: +4-0744-561842; Fax: +4-0264-599 891.

Received: 15 October 2010 / Accepted: 1 November 2010 / Published online: 15 December 2010

Abstract

Tobacco is a silent killer accounting for a great cause of death and disability. Scientific research has proved undoubtedly that it is a recognized cause for more than 25 different diseases affecting human beings, including several fatal diseases. The present study was conducted in the frame of Global Youth Tobacco Survey (GYTS), which attempts to determine the level of tobacco use, estimate the age of smoking initiation, levels of susceptibility to become cigarette smokers, exposure to tobacco advertising, attitudes and beliefs regarding tobacco use among youth. Its aim is to compare the two sets of data (2004, 2009) in order to assess the impact of tobacco control measures adopted in the interval between studies. In both studies all schools from Romania containing 6th, 7th, and 8th grade with 40 or more students were included in the sampling frame. A two-stage cluster sample design was used to produce a representative sample of students. SUDDAN software package has been used to compute standard errors for point estimates and produce 95% confidence intervals. Our data indicate a high prevalence of smoking among the studied ages in Romania. However, comparing the data across the two studies we noticed a decrease in both the prevalence of ever smokers and current smokers in 2009, a slightly decrease of the percentage of students exposed to other's people smoke in public places, along with a significant change on media and advertising regime, showing a positive impact of tobacco control measures adopted in the interval between studies.

Keywords: Tobacco; Prevalence; Students.

Introduction

Tobacco use is one of the leading preventable causes of premature death, disease, and disability worldwide [1]. Nowadays every tenth death among adults is attributable to tobacco use in the world [2].

Tobacco is a silent killer accounting for a great cause of death and disability. Scientific research has proved undoubtedly that it is a recognized cause for more than 25 different diseases affecting human beings, including several fatal diseases [3].

The wide range of serious health effects has been extensively reviewed. However, the list of conditions caused by tobacco consumption has grown. Present day, it is recognized that tobacco use contributes to cataracts, pneumonia, acute myeloid leukemia, abdominal aortic aneurysms, stomach cancer, pancreatic cancer, kidney cancer, periodontitis and several other diseases [4]. The harmful effect of environmental smoke, passive smoking, is also well documented [5,6].

In many countries tobacco use and the high prevalence of diseases and mortality caused by tobacco are posing serious health problem and causing a huge economic burden. Comprehensive information on tobacco prevention and control relating to young people were not, however available for many

developing countries. In order to address this gap, in 1998 the WHO Tobacco Free Initiative, the Office of Smoking and Health of US Centre for Disease Control and Prevention, and UNICEF in consultation with countries representing the six WHO regions have began a project called Global Youth Tobacco Survey, as an important form of global surveillance system in order to enhance tobacco surveillance in young people [7,8]. In Romania, smoking cigarettes represents one of the most socially accepted health risk behaviors. The problem is of great concern due to the high prevalence of this habit among adults and young people as well. Previous studies that have been done in our country showed alarming figures [9,10].

Romania, along with other 12 countries from Central-Eastern European region joined the Global Youth Tobacco Survey in 2004.

Aim

The GYTS attempts to address the following issues: determine the level of tobacco use, estimate the age of initiation among cigarette users, estimates levels of susceptibility to become cigarette smokers, exposure to tobacco advertising, identify key intervening variables, such as attitudes and beliefs on behavioral norms with regard to tobacco use among young people which can be used in prevention programs, assess the extent to which major prevention programs are reaching school based populations and establish the subjective opinions of those populations regarding such interventions. This study aim is to compare the two sets of GYTS data (2004, 2009) in order to asses the impact of tobacco control measures adopted in the interval between studies.

Material and Method

Sample Description and Weighting Procedures

The GYTS study was conducted twice in Romania, first in 2004 and the second time in 2009. In both studies all schools containing 6th, 7th, and 8th grade with 40 or more students were included in the sampling frame. A two-stage cluster sample design was used to produce a representative sample of students in schools containing the above grades. The first-stage sampling frame consisted of all schools containing 6th, 7th, and 8th grade. Schools were selected with a probability proportional to school enrollment size. The second sampling stage consisted of systematic equal probability sampling (with a random start) of classes from each school that participated in the survey. All classes in the selected schools were included in the sampling frame. All students in the selected classes were eligible to participate in the survey. All students in selected classes attending school the day the survey is administrated were eligible to participate. Student participation is voluntary and anonymous using self-administrated data collection procedures.

A weight has been associated with each questionnaire to reflect the likelihood of sampling each student and to reduce bias by compensating for differing patterns of non-response. The weight used for estimation is given by:

$$W = W1 * W2 * f1 * f2 * f3 * f4$$

W1 = the inverse of the probability of selecting the school

W2 = the inverse of the probability of selecting the classroom within the school

f1 = a school-level non-response adjustment factor calculated by school size category (small, medium, large).

f2= a class adjustment factor calculated by school

f3 = a student-level non-response adjustment factor calculated by class

f4 = post stratification adjustment factor calculated by gender and grade

The weighted results can be used to make important inferences concerning tobacco use risk behaviors of students, 13-15 year old in 6th, 7th, and 8th grade schools in Romania.

The Questionnaire

The questionnaire consists of 69 questions (developed especially for European region).

Core questions focused on 7 topics: prevalence, minors' access, cessation, knowledge and attitudes, tobacco-related school curriculum, media and advertising, environmental tobacco smoke.

The questionnaire was translated from English into Romanian and than independently retranslated from Romanian into English in order to insure the linguistic quality.

Data Collection and Data Entering

Before data collection, all selected schools received a request letter for their permission to implement the survey. Enclosed, the schools got a letter of support from the Ministry of Education. Survey administrators were trained in data collection during one-day training. They also received written instructions, and all of the documents needed for fieldwork. Data collection was administered in the school-setting (in the classrooms) using an anonymous self-reported questionnaire. Students recorded their responses directly on an answer sheet, using a special soft pencil. Data collection was carried out from April-June 2004, and the same interval in 2009. Answer sheets, as well as other documentations on data collection, were sent to the CDC. Data scanning and data-file compilation were executed at CDC.

Statistical Analysis

SUDDAN, a software package for statistical analysis of correlated data, was used to compute standard errors for point estimates and produce 95% confidence intervals [11]. Differences in proportions were considered statistically significant using non-overlapping confidence intervals assessment.

Definition of Indicators

The definition of indicators used in the study is listed in Table 1.

Table 1. Definition and indicators for tobacco smoke

Category	Definition
Ever smoker	Student who have smoked some time in his/her life.
Current cigarette smoker	Student who have smoke cigarettes at least once in the previous 30 days.
Daily smoker	Student who have smoked cigarettes 20 to all 30 days during the month preceding the survey

Results

Analyze of the data across the two studies conducted in 2004 and 2009 has been done on the basis of prevalence, and factors influencing tobacco use. We noticed that the prevalence of ever smokers decreased in 2009 comparing with 2004 from 49.9% to 41.2%. The difference is not statistically significant for the total sample, but stratified analysis by gender reveals a significant decrease of ever smokers among boys, from 60.2% in 2004 to 47.1% in 2009 (Table 2). As regarding the age of smoking initiation we notice a worrying, even if not statistically significant, increased percentage of ever smokers who initiated smoking before the age of 10 in 2009, as against 2004 (Table 2). The aspect is more evident in boys than in girls. However, the prevalence of current smokers decreased from 17.6% in 2004 to 13.5% in 2009, not statistically significant. As well it can be noticed a decrease of the prevalence of current users of other tobacco products, from 5.9% in 2004 to 2.5% in 2009, significant decrease in other tobacco use among boys.

The prevalence of never smokers susceptible to initiate smoking shows a little, but not significantly increases in 2009 as against 2004 (28.5%-30.5% respectively).

A large proportion of students are exposed to other's people smoke in their home. The percentage slightly decreased in 2009, comparing with 2004 (Table 3), but along with this it was also noticed a significant decrease of percentage of students (total, boys, and girls) that are in favor of banning smoking in public places.

Regarding the school curriculum it appears that quite the same proportions of students have been taught in the school about the dangers of smoking in 2009 as in 2004 (Table 3).

As media and advertising are concerned more than 9 in 10 students, both in 2004 and 2009 reported seeing anti-smoking messages on TV. The percentage of students that saw any advertising for cigarettes on billboards significantly decreased in 2009 (58.3%) comparing with 2004 (78.6%) (Table 3).

However, we also have noticed a significantly decrease of percentage of students who reported seeing pro-tobacco advertising in newspapers and magazines, from 72.7% in 2004 to 53.0% in 2009, and in that of students having an object with a cigarette brand logo, from 21.8% in 2004 to 12.1% in 2009.

Table 2. Prevalence – ROMANIA 2004 and 2009 (13-15 Years ONLY)

Prevalence	2004			2009		
	Total % (CI 95%)	Boys % (CI 95%)	Girls % (CI 95%)	Total % (CI 95%)	Boys % (CI 95%)	Girls % (CI 95%)
Ever smoked cigarettes	49.9 (44.3 - 55.4)	60.2 (54.7 - 65.5)	40.7 (33.9 - 47.8)	41.2 (37.3 - 45.2)	47.1 (41.2 - 53.1)	35.4 (30.7 - 40.6)
Ever Smokers, first smoked cigarettes before age 10	29.9 (26.2 - 33.8)	35.7 (31.0 - 40.7)	22.1 (17.3 - 27.9)	38.3 (32.4 - 44.5)	46.6 (38.2 - 55.2)	27.7 (23.4 - 32.4)
Current cigarette smoker	17.6 (14.0 - 21.9)	21.5 (16.1 - 28.0)	14.3 (11.4 - 17.7)	13.5 (10.6 - 17.0)	17.6 (12.1 - 24.8)	9.5 (7.8 - 11.6)
Current user of other tobacco products	5.9 (4.5 - 7.6)	7.7 (5.4 - 10.8)	4.3 (3.4 - 5.3)	2.5 (1.3 - 4.9)	3.0 (1.7 - 5.3)	1.9 (0.8 - 4.7)
Never smokers likely to initiate smoking in the next year	28.5 (19.4 - 39.7)	19.7 (12.9 - 28.9)	33.7 (22.6 - 46.9)	30.5 (24.2 - 37.7)	24.5 (19.2 - 30.7)	35.0 (26.6 - 44.5)

As regarding cessation, the analyze of the two sets of data, showed an important, even not statistically significant decrease of the percentage of current smokers students who want stop smoking, from 54.4% in 2004 to 37.7% in 2009, and this goes along with the increased percentage of addicted current smokers (current smokers who always feel like having a cigarette first thing in the morning), from 4.7% in 2004 to 7.8% in 2009.

A large proportion of students, both in 2004 and 2009, reported that they have not been refused purchasing cigarettes in a store because their age, but the percentage of students that have ever offered a “free” cigarette significantly decreased from 11.5% in 2004 to 7.6% in 2009.

Discussion

The Tobacco Atlas published by WHO in 2002 places Romania on the list of top ten countries, with an estimated 44% smoking rate [12].

Regarding the prevalence of smoking among the studied ages, comparing the data across the two studies (2004, 2009) we noticed that both the prevalence of ever smokers and current smokers had gone down in 2009, but the decrease was not significant. Starting with 1st of July 2008, the packages of cigarettes commercialized in Romania are provided with health warnings that contain images (pictograms). In the interval July 2008- October 2009 two studies have been conducted in Romania to evaluate the impact of pictograms, by the Pneumology Institute “Marius Nasta”, Totem Communication, and the International Development Research Centre Canada, on national representative samples of adolescents (1464) and adults from general population (800). The study conducted on adolescents [13] showed that approximately half of adolescents have attitudes of rejection of cigarettes due to the images on the packages. One out of two adolescents proves feelings of “disgust and repugnance” generated by the images on the cigarette packages, and 45% of them feelings of “concern and anxiety”. The study showed that the pictograms influence the decision of adolescents to start smoking. There have also been influenced the adolescents that are already smoking: half of them reported they have tried to quit smoking due to the warnings about health. As a result of labeling, youths adopt avoiding behaviors.

Of a great concern appears the larger proportion (38.3%) of ever smokers that tried smoking firstly at a very young age in the 2009 sample as against the 2004 one (29.9%). The aspect is more evident in male gender. In addition to this, the prevalence of never smokers susceptible to initiate smoking shows a little increase in 2009 as against 2004. The early initiation of smoking has a considerable health impact, smoking being recognized as an important independent risk factor for cardiovascular diseases, cancers etc. A longer exposure will lower the age of cardiovascular disease, cancers occurrences and also the age at which death is likely to occur. The gravity of these findings is strengthened by the fact that some of current smokers are already addicted to tobacco, which is putting them at a high risk for later tobacco related diseases and death.

Table 3. Factors influencing tobacco use – ROMANIA 2004 and 2009 (13-15 Years ONLY)

Factors	2004			2009		
	Total % (CI 95%)	Boys % (CI 95%)	Girls % (CI 95%)	Total % (CI 95%)	Boys % (CI 95%)	Girls % (CI 95%)
EXPOSURE TO SMOKE	63.7 (61.0 - 66.3)	62.6 (58.8 -66.2)	64.7 (61.6 - 67.7)	59.1 (55.8 - 62.4)	58.5 (54.4 - 62.5)	59.5 (55.9 - 63.0)
Parents smoke						
All or most best friends smoke	14.0 (12.3 -14.0)	14.1 (11.5 - 17.3)	13.9 (11.7 - 16.5)	13.6 (11.1 - 16.5)	14.6 (10.3 - 20.3)	12.6 (10.3 - 15.4)
In favor of banning smoking in public places	86.1 (83.1 -8 8.7)	85.5 (81.4 -88.8)	86.7 (82.6 - 90.0)	74.7 (68.2 - 80.3)	74.2 (67.2 - 80.1)	75.0 (67.8 - 81.0)
SCHOOL						
During this school year, were taught in any classes about the dangers of smoking	61.6 (56.2 - 66.8)	61.9 (56.6 -67.0)	61.3 (54.4 - 67.8)	60.2 (54.8 - 65.3)	60.8 (55.2 - 66.2)	59.9 (53.7 - 65.8)
MEDIA / ADVERTISING						
During the past month saw any anti-smoking media messages	95.0 (93.3 - 96.2)	94.8 (92.9 -9 6.3)	95.0 (93.1 - 96.4)	96.2 (95.2 - 97.0)	95.7 (93.7 - 97.0)	97.0 (96.2 - 97.6)
During the past month saw any advertisement for cigarettes on billboards	78.6 (72.3 - 83.8)	79.0 (72.9 -84.0)	78.3 (71.0 - 84.2)	58.3 (51.7 - 64.7)	58.2 (51.4 - 64.7)	58.6 (51.5 - 65.3)
During the past month saw any advertisements or promotions for cigarettes in newspapers or magazines	72.7 (70.0 - 75.2)	74.9 (70.9 - 78.4)	70.7 (67.7 - 73.6)	53.0 (47.6 - 58.3)	51.7 (45.5 - 57.9)	54.1 (48.6 - 59.5)
Have an object (t-shirt, pen, backpack, etc) with a cigarette brand logo on it	21.8 (17.1 - 27.4)	22.5 (18.1 -2 7.6)	21.2 (15.4 - 28.5)	12.1 (10.3 - 14.1)	14.7 (11.1 - 19.3)	9.4 (7.7 - 11.3)
CESSATION						
Current smokers who want to stop smoking now	55.4 (44.8 - 65.5)	46.5 (33.2 - 60.2)	66.0 (53.1 - 76.9)	37.7 (26.3 - 50.6)	31.5 (18.8 - 47.8)	49.3 (37.6 - 61.0)
Current smokers who always feel like having a cigarette first thing in the morning	4.7 (2.5 - 8.8)	6.1 (2.5 - 14.1)	3.3 (1.1 - 9.5)	7.8 (4.8 - 12.3)	6.9 (3.7 - 12.6)	9.7 (4.8 - 18.6)
ACCESS						
Current smokers who usually buy their cigarettes in a store were not refused purchase because of their age	68.9 (61.4 - 75.5)	60.5 (50.3 - 69.8)	76.8 (56.9 - 89.3)	77.3 (56.3 - 90.0)	75.8 (42.8 - 92.9)	85.1 (73.9 - 92.0)
Ever offered a “free” cigarette by a cigarette company representative	11.5 (9.3 - 14.2)	14.3 (11.3 - 18.0)	9.1 (6.6 - 12.4)	7.6 (6.3 - 9.2)	8.9 (7.4 - 10.6)	6.4 (5.0 - 8.2)

School based programs for tobacco prevention provides a unique opportunity for prevention. The study showed that, in general, more than one half of Romanian students were taught about tobacco use, and they discussed about the dangers and effects of tobacco smoking. However, the high prevalence of current smokers at young ages points to the necessity of school-based programs to fight against tobacco smoking. It appears as important to start the education programs for combating tobacco use at younger ages, respectively in elementary grades.

In 2009 more than one third of current smokers reported they would want to stop smoking, and more than a half of them have even tried to stop smoking. Comparing with the 2004 data, this figures had gone down. A high proportion of current smokers who tried to quit smoking reported they have received help or advice.

It is well known and documented that not only direct smoking, but also so called “*second hand smoking*” or environmental smoking has an important health impact [14]. It appears to be necessary to measure the young people exposure to others’ tobacco smoke and also to find out what is their opinion about the exposure to environmental smoke. The data from our country point to the fact that an extremely large proportion of students, and this is true even for non-smokers, are exposed in their home to others’ people smoke. In addition to this observation it is worth to mention that parents, siblings and friends of current smokers in their home smoke in a larger proportion than those of never smokers. It is well established that those children whose parents smoke have a higher premise to becoming smokers. The significantly high difference between never smoker and current smokers exposed to siblings or best friend smoke in their home point to the importance of peers influence and pressure. The fact that adolescents are aware about the dangers of environmental smoke for their health is reflected by their opinion regarding this aspect; around 3 quarters of them considering smoking should be banned in public places. This figure went a little bit down in 2009 comparing with 2004.

Teenagers are maybe the most susceptible target to be affected by advertising and, in general, by media messages. Thus, mass media have great responsibility in mediating both advertisement of tobacco use and anti-smoking messages. In this frame, it may have a great impact on teenagers, either if anti-smoking or tobacco advertisements are concerned. Our data shows that teenagers are more likely to meet anti-smoking messages on television than on radio, billboards, or newspapers /magazines. Even if the percentage of current smokers having an object with a cigarette brand logo on it is more than two fold larger in current smokers than in never smokers, we also have to focus on the latter ones, because their potential to become smokers. More than 1 in 10 current smokers reported being offered free cigarettes by representatives of tobacco companies in spite of complete ban by the law for distribution of free tobacco products. The percentage of students that saw any advertising for cigarettes on billboards significantly decreased in 2009 (58.3%) comparing with 2004 (78.6%), and we also have noticed a significantly decrease of percentage of students who reported seeing pro-tobacco advertising in newspapers and magazines, from 72.7% in 2004 to 53.0% in 2009. We consider that this aspect is the result of adopting the Law 457/2004, Directive: 31.12.2006 which stipulates that is completely banned the advertising in newspapers and magazines, the exposure of any advertising materials in theatres, cinemas, on billboards and outdoors walls, wherever they are located. The law is enforced by increased fees and by suspending institution’s activity for contravention.

Unfortunately, our data, both from 2004 and 2009, show that the majority of current smokers can get their cigarettes by buying in a store and, about over three-fourth of them reporting that they have never been refused because of their age, in spite the fact that tobacco products selling to minors is prohibited.

Conclusions

Our data indicate a high prevalence of smoking among the studied ages in Romania. However, comparing the data across the two studies (2004, 2009) we noticed that both the prevalence of ever smokers and current smokers had gone down in 2009, showing a positive impact of tobacco control measures adopted in the interval between studies, in accord with WHO mpower strategy. Also, a significant impact of legislation on media and advertising regime has been noted.

The goal is to continue reducing the prevalence of smoking among young people. In order to achieve this goal our actions should focus on: education programs, cessations programs addressed to youth and measures for reducing the environmental exposure to smoke.

Conflict of Interest

The author(s) declare that they have no conflict of interest.

Acknowledgements

The GYTS surveys were supported financially and technically by the World Health Organization-Tobacco Free Initiative and the Centre for Disease Control. The Romanian Ministry of Health and Ministry of Education and Research offered their support to carry out this study.

We would like to thank Dr. Charles W. Warren (Distinguished Fellow Statistician, CDC – Office on Smoking and Health) for his professional hard work during the study and analysis and for the great help he provided as for the completion of this final report. We also thank Ms Yulia Kadirova and Ms Rula Nabil (Technical Officer, tobacco Free Initiative – WHO regional Office for Europe) and Dr. Haik Nikogosian (Regional Adviser, WHO regional Office for Europe) for their help in the organization and implementation of this survey and the completion of the present report.

We thank also to Ms. Ann Goding, Mr. Brandon O'Hara, Ms. Juliette Lee, Ms. Lea Veronica (epidemiologists US Centre for Diseases Control and Prevention) and all the colleagues in the CDC and WHO for their help.

References

1. Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJL. The Comparative Risk Assessment Collaborating Group. Selected major risk factors and global and regional burden of disease. *Lancet* 2002;360:1347-60.
2. Mathers CD, Loncar D. Projection of global Mortality and burden of disease from 2002 to 2030. *PLoS Medicine* 2006;3(11):e442.
3. European Strategy for tobacco Control (2002): WHO, Regional Office for Europe: Copenhagen.
4. Health Consequences of Smoking. A Report of the Surgeon General. Atlanta, GA, United States Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Disease Prevention and Promotion, Office of Smoking and Health, 2004.
5. United States Environmental protection Agency, Office of Research and Development, Office of Air and Radiation (1992): Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders.
6. Gonzales AC, Passive smoking. *BMJ* 2003;326:1094.
7. Warren CW, Jones NR, Peruga A, Chauvin J, Baptiste JP, Costa de Silva V, et al. Global youth tobacco surveillance, 2000-2007. *MMWR Surveill Summ* 2008;57:1-28.
8. Global Youth Tobacco Survey Collaborating Group. Differences in worldwide tobacco use by gender: findings from the Global Youth Tobacco Survey. *J School Health* 2003;73:207-15.
9. ESPAD Study [online] 2004 [Accessed October 10, 2010]. Available from: URL: <http://www.espad.org/romania>
10. Knowledge, Attitudes, Practices for Tobacco Control Romania 2003 Study. [online] 2004 [Accessed October 10, 2010]. Available from: URL: http://www.ms.ro/documente/284_581_Studiu_CPSS_04.pdf
11. Shah BV, Barnwell BG, Bieler GS. Software for the Statistical Analysis of Correlated Data (SUDDAN): User's Manual, Release 7.5 Research Triangle Institute, Research triangle Park, NC.
12. Mackay J, Eriksen M. The Tobacco Atlas, World Health Organization [online] [Accessed October 10, 2010]. Available from: URL: <http://whqlibdoc.who.int/publications/2002>
13. *** [online] [Accessed October 10, 2010]. Available from: URL: http://www.comunicatedepresa.ro/pdf_format.php?cid=59774
14. International consultation on environmental tobacco smoke (ETS) and child health. Consultation report (WHO document WHO/NCD/TFI/99.10), Geneva, WHO, 1999)
15. Martin JM, Jabot F, Marrel P. How to Organise the Medical Data of Chronically III Patients in the Computer. *Meth Inform Med* 2001;24:5-12.
16. Fauci AS, Braunwald E, Isselbacher KJ, Wilson JD, Martin JB, Kasper DL, et al. Editors. Harrison's principles of internal medicine. 14th ed. New York: McGraw Hill, Health Professions Division; 1998.
17. Serena C, Pastor FJ, Gilgado F, Mayayo E, Guarro J. Efficacy of Micafungin in Combination with Other Drugs in a Murine Model of Disseminated Trichosporonosis *Antimicrob. Agents Chemother* [serial online] 2005 [cited September 2010];49:497-502. Available from: URL: <http://aac.asm.org/cgi/content/full/49/2/497>.