

DOES TOBACCO USE AMONG ADOLESCENTS COME OUT OF STYLE IN CZECHIA AND SLOVAKIA? FINDINGS FROM THE GLOBAL YOUTH TOBACCO SURVEY BETWEEN 2002 AND 2016

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SUMMARY

Objectives: The aim of this study is to analyse Global Youth Tobacco Survey (GYTS) data on a prevalence of tobacco use, indicators of tobacco control and pro-tobacco activities in Czechia and Slovakia between 2002 and 2016.

Methods: GYTS is a school-based survey of students aged 13–15 years carried out in Czechia and Slovakia in 2002/2003, 2007, 2011 and 2016. Standardized uniform questionnaires provided representative data.

Results: Between 2002 and 2016 the current cigarette smoking declined both in Czechia and Slovakia (from 34.6% and 26.4% to 15.2% and 17.1%, respectively). Indicators of tobacco control activities either did not change (access to buy cigarettes by minors) or decreased (school-based and mass media interventions). Indicators of pro-tobacco activities declined (being ever offered by a free tobacco product and having something with a tobacco product brand logo on it).

Conclusions: Tobacco use is on decline and the situation becomes similar to the most of European countries. Preventive activities are only partially responsible for the process. Rather effect of global trends accelerated by widespread use of social media can play a role.

Key words: tobacco use, adolescents, trends

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INTRODUCTION

Tobacco use still remains the leading preventable risk factor of numerous chronic diseases significantly contributing to premature mortality and morbidity rate globally. In European region, one half of all people who regularly smoke die from tobacco-related diseases, half in middle age and half in old age. Situation in Central and Eastern European countries is particularly urgent. Middle-aged men here are at two times higher risk of death from tobacco-related disease than men in Western Europe (1).

Czechia and Slovakia rank among countries with relatively high prevalence of tobacco use. According to relevant estimations of the WHO in adult population, males clearly dominate above females in daily tobacco smoking in Czechia and Slovakia (30.1% vs. 21.4% and 29.6% vs. 16.3%, respectively) (2).

The first Act on Protection of Non-smokers was in Slovakia passed as early as in 1997 (Act No. 67/1997 Coll.) and regulated the sale of tobacco products. It was replaced by the newer norm (Act No. 377/2004 Coll.) passed in 2004 and being in force until now. It also determined healthcare facilities, schools, governmental and public administration offices, public transport facilities including train stations and bus stops as smoke-free areas and

partially banned smoking in catering facilities. The amendment from 2009 (Act 87/2009 Coll.) extended its force also to products intended for smoking and not containing tobacco. Moreover, it made passive smoking prevention in catering facilities more effective as defining need to separate any smoking areas. The amendment from 2013 (Act 142/2013) extended the ban of smoking to shopping centres. Slovakia ratified the Framework Convention on Tobacco Control (FCTC) on May 4, 2004.

In Czechia, the Act 379/2005 Coll. on Measures for Protection Against the Harmful Effects of Tobacco Products, Alcohol and Other Addictive Substances was passed in 2005. It bans smoking in healthcare facilities, schools, governmental and public administration offices, public transport facilities including train stations and bus stops. However, it does not direct smoke-free catering facilities. The Czech Republic ratified FCTC on June 1, 2012.

In both Czechia and Slovakia legislative norms ban the advertisement of tobacco products in any types of information carriers, free distribution of tobacco products samples and advertising items not related to smoking, with the exception of advertising things distributed at the points of sale. Similarly, they do not permit any forms of advertisement and teleshopping for tobacco products in all electronic media. Pricing in these countries belongs to the most

effective measures. The excise tax, harmonized with the European Union directives, includes more than 75% of retail prices.

Summarizing, Czech and Slovak tobacco control legislation achieved rather high level of legal health protection of children and youth as well as of non-smokers in general. However, the legislation only partially ensures smoke-free environment (situation in 2016).

Considering tobacco use, adolescents present a special population group since initiation and development of tobacco use occurs mostly at this age. Therefore, monitoring of tobacco use in this age group is one of the crucial components of effective and comprehensive tobacco control measures. Several authors pointed out gradual decline of tobacco use among adolescents in Western European countries, considered especially as an effect of tobacco control measures, namely restricted availability, pricing and decreased social tolerance towards smoking. In Czechia, tobacco use in adolescents reached its peak in the mid of 2000s (3). The observed decrease has been also considered as a manifestation of overall changes in adolescents' behaviour after the millennium (4). However, there is insufficient evidence about factors responsible for the decline as well as social and behavioural changes corresponding with the decline.

The Global Youth Tobacco Survey (GYTS) is a component of a global standard monitoring adolescents' tobacco use and related factors as well as key tobacco control indicators (5). GYTS data make possible to analyse the changes of tobacco use in a social context as part of general development of adolescents' behaviour.

This paper analyses the changes of selected indicators of tobacco use (current use of any tobacco product, cigarettes, tobacco products other than cigarettes, water pipes, as well as electronic cigarettes), factors related to effectivity of tobacco control (anti-tobacco messages in media, school based activities, availability to buy cigarettes by underage smokers) as well as pro-tobacco activities among adolescents (being ever offered a free tobacco product or having items with a tobacco product brand logo) in Czechia and Slovakia. The results can contribute to understanding role of overall social changes determining prevalence of tobacco use in adolescents as a component of their behaviour.

MATERIALS AND METHODS

The GYTS uses a standardized methodology for constructing sampling frames, selecting schools and classes, preparing

questionnaires, carrying out field procedures, and processing data. It presents a school-based survey of defined geographic sites that can be countries, provinces, cities, or any other sub-national areas or territories. The GYTS uses a two-stage cluster sample design that produces representative samples of students in grades associated with age 13–15 (6). The sampling frame includes all schools containing any of the identified grades. At the first stage, the probability of schools being selected is proportional to the number of students enrolled in the specified grades. At the second sampling stage, classes within the selected schools are randomly selected. All students in selected classes attending school on the day of the survey are administered and are eligible to participate. Student participation is voluntary and anonymous using self-administered data collection procedures. The GYTS sample design produce representative, independent, cross-sectional estimates for each site.

Table 1 shows the basic characteristics of the samples in Czechia and Slovakia, the overall response rate in all cases was above three quarters of all eligible students. Drop-outs were caused mostly by the absence due to illness or other personal reasons. Therefore, they were not related to analysed variables and could not significantly influence the results.

The uniform GYTS questionnaires covered seven categories: tobacco use, knowledge and attitudes regarding tobacco, environmental tobacco smoke exposure, media and advertising, desire for cessation, access and availability to obtain tobacco, and teaching in schools on tobacco (5, 7). Accuracy of the translated questionnaires was checked through back translation. In this analysis, the following variables were used and defined:

- Current use of tobacco, current cigarette smoking, current use of tobacco products other than cigarettes (pipes, cigars, cigarillos, water pipes, etc.), current use of water pipes (shisha) alone and current use of electronic cigarettes (a respective description as “battery-powered devices that produce vapour instead of smoke” was given in the questionnaire just before the series of questions on these products) was measured through proportion of respondents reporting doing the respective activity on 1 or more days in the past 30 days.
- Access to buy tobacco products was measured through proportion of current cigarette smokers who were not prevented from buying cigarettes in the past 30 days because of their age.
- Anti-tobacco messages in media were measured through proportion of respondents reporting to see or hear any anti-tobacco messages in the media in the past 30 days.

Table 1. Basic characteristics of samples obtained in four waves of GYTS in Czechia and Slovakia

	Year	Number of 13–15 years old respondents		School level response rate %	Student level response rate %	Overall response rate %
		Total	Boys n (%)			
Czechia	2002	3,656	1,825 (49.9)	100.0	88.0	88.0
	2007	3,191	1,693 (53.0)	100.0	84.7	84.7
	2011	3,348	1,661 (49.6)	98.0	85.7	84.0
	2016	3,521	1,745 (49.6)	89.8	87.2	78.3
Slovakia	2003	3,571	1,803 (50.5)	98.3	87.4	85.9
	2007	4,127	2,010 (48.7)	100.0	86.1	86.1
	2011	3,888	1,912 (49.2)	100.0	81.8	81.8
	2016	3,557	1,781 (50.1)	100.0	82.6	82.6

- School based curricular activities were measured through proportion of respondents reporting to be taught in any classes about the dangers of tobacco use during the past 12 months.
- Tobacco promotion activities among adolescents were measured through proportion of respondents who reported being ever offered a free tobacco product as well as having something (e.g., t-shirt, pen, backpack) with a tobacco product brand logo on it.

A weighting factor was applied to each student record to adjust for non-responses and variation in the probability of selection at the school, class and student levels. SUDAAN, a software package for statistical analysis of correlated data (8), as well as EPI INFO were used to calculate weighted prevalence estimated (expressed as percentage) and 95% confidence intervals of the

estimates. Details of the methodology are included in previous publications on GYTS (5, 9, 10).

Frequencies of the variables are presented as weighted percentages with respective confidence interval 95%. Differences between prevalence estimates were considered statistically significant if the 95% confidence intervals did not overlap.

RESULTS

Figures 1 and 2 show prevalence of various types of tobacco use in boys and girls: any tobacco use, cigarette smoking, tobacco products other than cigarettes, water pipes alone, as well as electronic cigarettes.

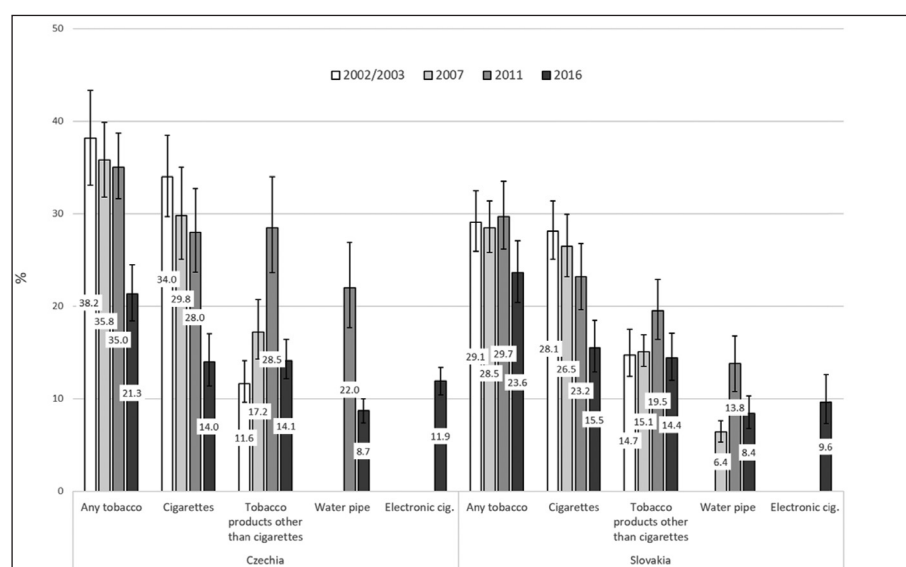


Fig. 1. Current use of tobacco and electronic cigarettes in Czechia and Slovakia among boys.

Percentage of 13–15 years old boys reporting to use any tobacco product, to smoke cigarettes, to use tobacco products other than cigarettes, to smoke water pipe^a and electronic cigarettes^b on 1 or more days in the past 30 days (error bars present confidence interval 95%).

^aWater pipe use was not monitored individually in GYTS Czechia 2007.

^bQuestions on electronic cigarette use were included into the questionnaire only in 2016.

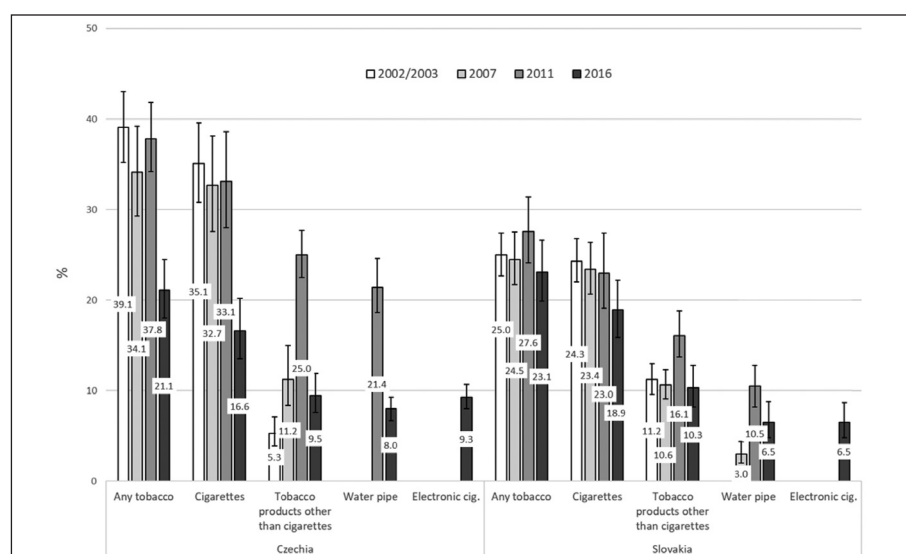


Fig. 2. Current use of tobacco and electronic cigarettes in Czechia and Slovakia among girls.

Percentage of 13–15 years old girls reporting to use any tobacco product, to smoke cigarettes, to use tobacco products other than cigarettes, to smoke water pipe^a and electronic cigarettes^b on 1 or more days in the past 30 days (error bars present confidence interval 95%).

^aWater pipe use was not monitored individually in GYTS Czechia 2007.

^bQuestions on electronic cigarette use were included into the questionnaire only in 2016.

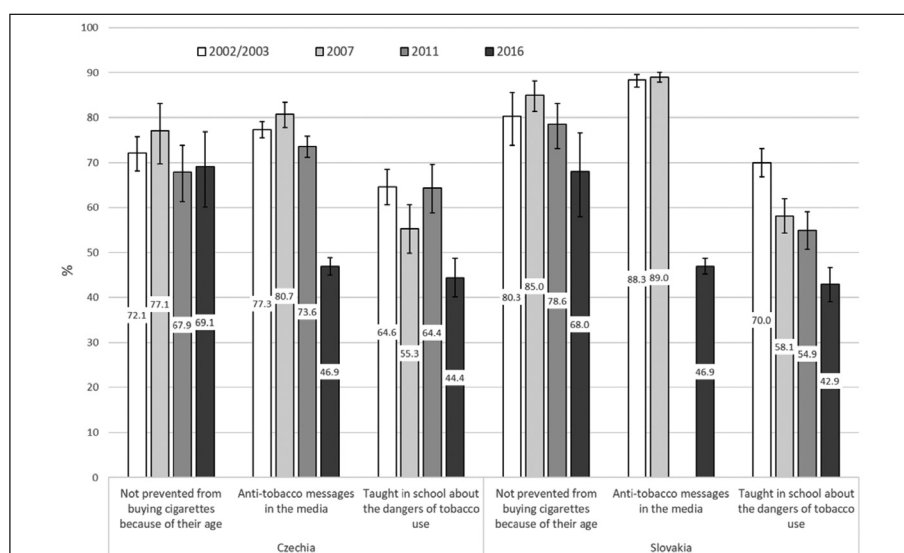


Fig. 3. Indicators of tobacco control activities in Czechia and Slovakia.

Percentage of 13–15 years old current smokers reporting not being prevented from buying cigarettes in the past 30 days because of their age; percentage of 13–15 years old respondents reporting to see or hear any anti-tobacco messages in the media in the past 30 days^a; percentage of 13–15 years old respondents reporting to be taught about the dangers of tobacco use in class during the past 12 months.

^aReports to see or hear any anti-tobacco messages in the media were not monitored in GYTS Slovakia 2011.

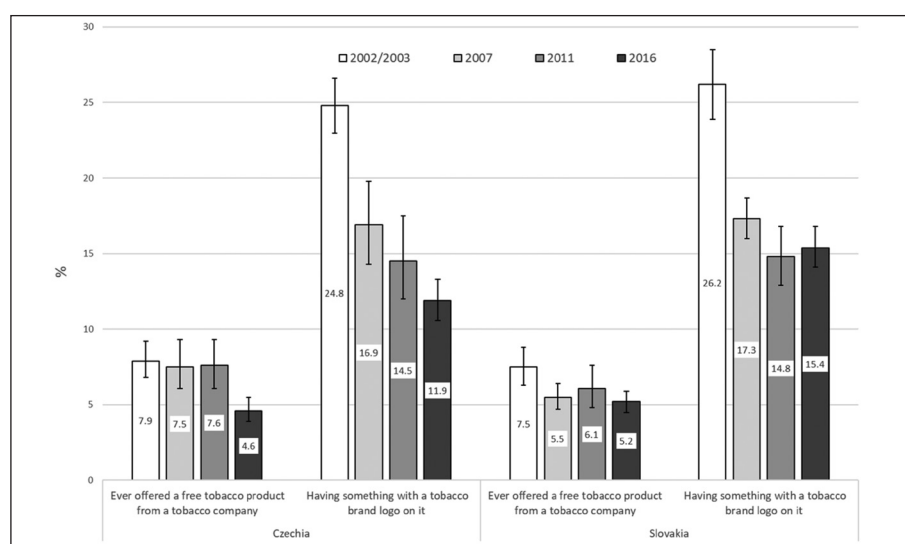


Fig. 4. Pro-tobacco activities in Czechia and Slovakia.

Percentage of 13–15-years old respondents reporting being ever offered a free tobacco product from a tobacco company; percentage of 13–15 years old respondents reporting to have something with a tobacco product brand logo on it.

Prevalence of tobacco use has remained almost unchanged in Czechia until 2011. However, later on it declined from about one third to about one fifth in 2016, in both boys and girls. On the other hand, the decline in Slovakia was not remarkable and did not reach statistical significance.

Prevalence of current cigarette smoking declined in Czechia between 2011 and 2016 from about one third of respondents to less than one fifth. In Slovakia, the decline from 2003 to 2016 reached a significant difference only in boys (from 23.2% to 15.5%) (Fig. 1). No remarkable gender differences were present through the studied period in Czechia and Slovakia.

In Czechia, current use of tobacco products other than cigarettes remarkably increased in 2011 reaching about one quarter of boys and girls and decreased in 2016 to original levels. In Slovakia, the increase in 2011 was not so sharp and reached a

significant difference only in girls (Fig. 2). Boys dominated above girls in 2002 and 2016 in Czechia, and in 2007 in Slovakia.

Question on water pipe use alone was included into the GYTS questionnaire in 2007 in Slovakia and in 2011 in Czechia. In 2007, the prevalence of current use in Slovakia was relatively low with predominance of boys (6.4% vs. 3.0%), and sharply increased in 2011 (13.8% in boys and 10.5% in girls). In 2016, it dropped significantly in boys (8.4%) while in girls remained two times higher than in 2007 (3.0% vs. 6.5%). In Czechia, the prevalence of current use in 2011 was remarkably higher than in Slovakia (22.0% in boys and 21.4% in girls), and sharply decreased in 2016 to levels similar to Slovakia (8.7% in boys and 8.0% in girls).

Electronic cigarette use indicators were included into the GYTS questionnaire firstly in 2016 and the prevalence of current use did not reach one tenth of respondents holding only

insignificant differences either between countries or between boys and girls.

Anti-tobacco activities in Czechia and Slovakia are presented in Figure 3. About 7 in 10 of current smokers in Czechia reported not prevented from buying cigarettes because of their age within last month with no apparent changes within the given time period. In Slovakia, the proportion was similar like that of Czechia. However, some decline in 2016 can be seen, causing a significant difference between 2007 and 2016 (from 85.0% to 69.8%). Anti-tobacco media messages were reported within 2002 and 2011 by three in four respondents in Czechia and almost 9 in 10 respondents in Slovakia. However, these values considerably declined in 2016 to almost identical level (46.9%) in both Czechia and Slovakia. In Czechia, more than half of respondents reported to be taught about the dangers of tobacco during the last years from 2002 to 2011. However, in 2016 the percentage significantly dropped to 44.4%. In Slovakia, the percentage gradually declined from 70.0% in 2003 to 42.9% in 2016.

Percentage of respondents being offered free tobacco products from a tobacco company was lower than 10 (Fig. 4) and significantly declined in both Czechia (from 7.9% in 2002 to 4.6% in 2016) and Slovakia (from 7.5% 2003 to 5.2% in 2016) Percentage of students reporting to have something with a tobacco brand logo on it declined in Czechia gradually from 24.8% in 2002 to 11.9% in 2016. The fall was particularly remarkable between 2002 and 2007. In Slovakia, the development was similar with a significant decrease between 2003 and 2007 (from 26.2% to 17.3%). The further changes were insignificant (Fig. 4).

DISCUSSION

The results clearly indicate a remarkable change of the epidemiological situation. Overall tobacco use declined particularly in Czechia between 2011 and 2016. Development of cigarette smoking was similar, however, the prevalence rate dropped even more sharply and in 2016 the values became very similar in both countries. On the other hand, development of situation regarding the use of tobacco products other than cigarettes was different. In Czechia, the prevalence after gradual increase until 2011 suddenly dropped in 2016 to original levels seen in 2002. In Slovakia, the development showed similar pattern, however, increase in 2011 was mild, causing significant changes only in boys.

The different development of cigarette smoking and use of other tobacco products resulted in disappearance of traditionally seen overwhelming predominance of cigarettes (9). In 2002/2003 cigarette smoking strongly dominated and shared the overwhelming proportion of overall tobacco use. However, in 2016, the ratio between these two forms of tobacco smoke changed in favour of other tobacco products in both Czechia and Slovakia. In boys, the percentage of other tobacco use become almost the same as cigarette smoking. These findings indicate that cigarettes are more and more extruded by other forms of tobacco. It corresponds with an emergence of water pipe use in Europe as a main representative of new forms of tobacco (11, 12).

Our results also confirm that electronic cigarettes as a relatively new phenomenon have been very well established in Central and Eastern Europe (13, 14), similarly as in Western Europe and USA (McCarthy 2015). In the light of our findings, the concerns

regarding adolescents' use of electronic cigarettes and new exotic forms of tobacco as possible gateways for nicotine addiction (15, 16) gain importance. Taking into consideration low perception of risk among adolescents regarding these products (17, 18), public health measures should therefore focus their attention on them besides traditional forms of tobacco. However, current GYTS data on electronic cigarettes do not allow analyse changes across time. On the other hand, we will pay attention to this issue in the next surveys to obtain more complex data making possible deeper analyses, particularly focused on initiation (either first e-cigarettes users or those switching from cigarettes) and dual use of e-cigarettes and other products.

Recently published articles indicate comprehensive tobacco control measures as a main determinant of tobacco use decline observed within last couple of years in European countries (19, 20). During the studied time the tobacco control activities, such as anti-smoking messages in media and school curricular programmes, remarkably attenuated in Czechia and Slovakia. Similarly, frequency of sale promotion activity of tobacco industry (being offered free cigarettes and having items with a tobacco brand logo) decreased, as well. On the other hand, high availability to buy cigarettes has remained almost unchanged. However, smoking prevalence in general public within given time (WHO Global Report on Trends in Prevalence of Tobacco Smoking 2015) remained almost unchanged. Therefore, the observed changes in tobacco use in adolescents can be explained convincingly either by more effective preventive measures or decline of smoking as a whole. One of the possible explanations can be a gradually changing behaviour of smokers, regardless of the legislation. We should look for the reason in overall changes of social environment occurring during the given time period further reflecting in adolescents' attitude and behaviour (20). Considering potential determinants co-occurring at the same time, widespread use of social media emerging during last couple of years draws an attention. Several authors pointed out behavioural changes associated with screen-based activities (21) mostly in terms of increased risk of insufficient physical activity and obesity (22, 23). However, a link between use of mobile information technologies and tobacco has not been well understood until now, however, possible interconnections lie in changed character of social interactions. They have moved from common spending of spare time outside home to online communication. Some of the Health Behaviour in School-aged Children (HBSC) study results indicating a decline of number of adolescents going out with their friends after 2002 (4) suggest such view. However, recent findings do not support it and rather point to links between social media use and risk behaviour (24). Therefore, the co-occurrence of widespread use of social media and decline of tobacco use can be hardly explained by direct causal association. Thus, another possible effect should be taken into account. Internet communication, generally, unprecedentedly enhances information exchange across nations and cultures. Considering this, global factors, rather than local ones, determine behaviour of adolescents including tobacco use. The development of epidemiological situation in Czechia and Slovakia supports this view. Originally seen differences between Czechia and Slovakia disappeared, i.e., a specific character of tobacco use in these Central European countries seen in the 2000s (25, 26) has been changing getting similar to Western Europe and North America.

Decreased proportion of young people in Central Europe supporting ban on tobacco seen between 2008 and 2014 suggest the idea of losing topicality of smoking as a social issue, similarly as in other high-income countries (27).

Considering possible limitations of the findings it should be mentioned that the results are based on self-reports; thus, the data can to some extent vary from the actual situation. However, reliability studies focused on similar tobacco-related questions have shown good test-retest results (28). We can consider standardized uniform methods of sampling data collection used in each survey as the strong points of the study making the findings representative and reflecting actual changes in the society.

Smokeless tobacco products have not been included into the GYTS questionnaire since these forms are very rare in adolescents in Central Europe and do not present a public health issue. However, considering changing social environment, they would be included into the questionnaire in the next surveys.

CONCLUSION

Summarizing, tobacco use is on decline in Czechia and Slovakia. Untraditional forms of tobacco (particularly water pipes) and electronic cigarettes partially established in the countries are leading to loss of hegemony of cigarettes as a traditional overwhelming form of tobacco use. Moreover, differences across countries have been disappearing leading to uniform character of tobacco use across Europe. Tobacco control interventions only partially explain the process. Therefore, the main determinant of it lies in overall change of adolescents' attitudes and behaviour. One of the possible causes of the changes is the massive use of mobile internet technologies and integration of social media into daily life of adolescents. Their globalising character possibly accelerated development of tobacco use epidemiology in adolescents resulting in a decrease of public interest in it, thus turning into a situation seen in most of high-income countries.

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Conflict of Interests

None declared

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