

# Doctor's enquiry: an opportunity for promoting smoking cessation—findings from Global Adult Tobacco Surveys in Europe

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**Background:** Evidence suggests that advice from motivated physicians to their smoking patients is effective in promoting smoking cessation. Yet, detection rate of smokers is often low and, the proportion of smokers receiving special advice to quit varies. This study aimed to detect how frequently European physicians enquire about their patients' smoking status, and to compare and contrast how (if any) smokers benefit from physicians' enquiry and/or advice about smoking cessation. **Methods:** The study was based on secondary analysis of data from six European countries that conducted Global Adult Tobacco Survey, namely, Greece, Poland, Romania, Russia, Turkey and Ukraine. **Results:** Out of Global Adult Tobacco Survey participants who were smoking 12 months preceding the survey and had 'at least one visit to a physician' before the survey, half were asked by their physicians about their smoking status and only 37.7% got a brief advice from their physicians to quit smoking. Remarkably, 25% of current smokers did not get any advice from their physicians to quit even when the smoking status was enquired. The adjusted odds ratio was found as 1.55 (95% confidence interval=1.29–1.87) for the association between physician's enquiry about smoking status of a patient and his/her attempt to quit smoking. **Conclusion:** Even a simple enquiry of the physician about smoking status of a patient could be effective in smoking cessation, yet, enquiry and advice rates are still far below expected. Regardless of the reason for admission, each contact with a patient should be used as an opportunity to combat smoking-related health risks.

## Introduction

Tobacco use can lead to tobacco/nicotine dependence and serious health problems. Quitting smoking greatly reduces the risk of developing smoking-related diseases. However, tobacco dependence is a cluster of behavioral, cognitive and physiological phenomena, and quitting tobacco is not easy. Quitting smoking is motivated by a number of dynamics. Among all, health professionals' role is critical in promoting smoking cessation and this key role becomes stronger, when they 'routinely' ask and talk about smoking history with their patients.<sup>1</sup> Such advice may be brief or part of more intensive interventions. A Cochrane review on physician advice on smoking cessation, 17 randomized controlled trials were identified and data were pooled to investigate the efficacy of a brief advice vs. no advice. The findings demonstrated a statistically significant increase in quit rates, with a relative risk of 1.66 and 95% confidence interval (CI) of 1.42–1.9. When the intensity of advice was higher, quit rates increased by an additional 20–65%, among unselected and high-risk patients, respectively.<sup>2</sup>

In general, physicians' advice produces a 1–3% increase in adult cessation rates.<sup>3,4</sup> From a public health perspective, even if the effectiveness of facilitating smoking cessation by physicians is small, provided large numbers of physicians could offer advice, the net effect on reducing smoking rates could be substantial.<sup>5</sup> Unfortunately, detection rate of smokers by many physicians and the proportion of smokers who routinely receive advice from their physicians to quit are both low.<sup>6,7</sup> Several investigators have attempted to encourage physicians to routinely identify smokers and to provide smoking cessation advice.<sup>8–12</sup> 'Any' visit to a hospital/physician's office for a health-related concern, including

those seeking regular check-ups should be considered as 'a crucial opportunity' with regard to secondary/tertiary prevention of smoking individuals from smoking-related morbidity and mortality.

This study aimed to detect how frequently European physicians enquire about their patients' smoking status in real life settings, to reveal how often they give an advice to their smoker patients to quit smoking, and to compare and contrast how (if any) European smokers benefit from physicians' enquiry and/or advice about smoking cessation.

This study was based on secondary analysis of Global Adult Tobacco Use Survey (GATS) data pooled from all six European countries, where a similar, standardized, comparable tobacco use survey over a period of 3 years, between 2009 and 2013.

## Materials and methods

### Study design

The study was based on secondary data analysis using GATS data, open to public at website of Centers for Disease Control and Prevention's Global Tobacco Surveillance System Data (accessed on 22 February 2016). This study is based on GATS data from Greece (2013), Poland (2009), Romania (2011), Russia (2009), Turkey (2012) and Ukraine (2010).

### Study participants

GATS series are conducted as cross-sectional studies, representative of relevant adult populations, aged 15 years or over. GATS has been carried out in many countries for many years worldwide, and the standardized questionnaires in use enable comparisons across countries for many tobacco-related issues, including cessation.<sup>13</sup>

Sample sizes need to be adequate to prevalence rates for total adult population of selected countries. Thus, numbers of participants approached were different for Greece ( $n=4359$ ), Poland ( $n=7840$ ), Romania ( $n=4517$ ), Russia ( $n=11\,406$ ), Turkey ( $n=9851$ ) and Ukraine ( $n=8158$ ), summing up to a total of 46 131 participants. The details of the survey protocols, questionnaires and manuals can be accessed elsewhere.<sup>14</sup>

This study is restricted to GATS participants who reported smoking 12 months before the survey and were either 'current smokers' or 'quitter attempters' (i.e. those who had at least one quit attempt since then) at the time of the survey. Quit attempters were further grouped in this study as 'those who had a quit attempt over the past 12 months and were not smoking at the time of the survey' and 'those who had at least one quit attempt over the past 12 months but re-started and were smoking at the time of the survey'. The total study population for analyses were 15 507 individuals (1716, 2564, 1101, 4981, 2583, 2562 from Greece, Poland, Romania, Russia, Turkey and Ukraine, respectively).

GATS is basically designed to calculate smoking prevalence and relevant risk factors in societies. Calculation of quit rates, nor relevant risk factors, is not of primary concern in GATS. Thus, questions in the GATS core questionnaire were evaluated carefully and re-coded for the purposes of the study. Based on GATS codebooks and questionnaires on web: study participants who said *yes* to the question *D01. During the past 12 months, have you tried to stop smoking?* and who said '<12 months' to the question *B13a. How long has it been since you stopped smoking?* were used in this study as 'quitter attempters'.

The questions used for 'a physician visit' were questions B14 and D04: *Have you visited a doctor or other health care provider in the past 12 months?* For 'doctor's advice to quit smoking', we used GATS questions B17 and D07, i.e. *During any visit to a doctor or health care provider in the past 12 months, were you advised to quit smoking tobacco?* (GATS Codebooks for each country)

### Statistical analysis

Statistical analysis included frequency and percent distributions;  $\chi^2$  test was used for statistical comparison of categorical groups. Multivariable logistic regression analysis was used to model the dependent variable, i.e. 'at least one quit attempt over the 12 months preceding the GATS interview'. The most explanatory model was reached using 'enter' command, to adjust for all potential confounders simultaneously. Potential confounders were restricted to those enquired in the core GAT surveys. Two multivariable logistic regression models were compared and contrasted in analyses to study effectiveness of physician's enquiry of smoking status of a patient and physician's advice to smokers for quitting. These two models were named in the study as: (i) The Study Model: included variables for country, place of residence, gender, age, educational attainment, occupational status, presence of any anti-smoking rules at home, knowledge on health hazards of active smoking, knowledge on health hazards of passive smoking, time between wake-up and the first smoking experience and physician's enquiry about smoking (Supplementary table S1) and (ii) The Full Model: added one additional variable to the Study Model, i.e. physician's advice to quit smoking. The size of potential associations with 'a quit attempt' (yes vs. no) and 'any visit to a physician over the preceding 12 months' (yes vs. no), 'doctor's enquiry on cigarette smoking status of the patient' (yes vs. no) and 'doctor's advice on stopping smoking' (yes vs. no) were assessed by adjusted odds ratios and relevant 95% CIs. In all analyses, weights were used as inverses of sampling fractions (as reported by each country) to get robust estimates, adjusting for the sampling scheme. SPSS ver. 23.0 statistical software package Complex Samples module was used for analysis (IBM corp.).

### Ethical issues

As the datasets are open access to public,<sup>14</sup> further institutional ethical permission was not required. The study was exempt from our Institutional Review Board. No individual identifiers were used at any analytical step.

### Results

Data used in the study were based on a total of 15 507 adults, randomly selected from 6 countries, to represent corresponding populations aged 15 years or over, and were restricted to those who were reportedly smoking cigarettes 12 months preceding the GATS interview.

Distribution of basic sociodemographic characteristics of the population is presented in table 1. Study participants were mainly males (69.8%), urban residents (73.6%) and about 65% were actively working at the time of the interview.

In the study, two questions were used to evaluate whether there are any specific anti-smoking rules in residential environment or at work (for active workers). Prevalence of no-smoking rules in residential or occupational settings varied significantly by the country of origin; some participants did not even have a concept of 'rules' about smoking, where smoking behavior in the house was described as 'allowed' or not 'allowed'. About 30% of the overall study population reported that smoking was 'not allowed' at home. The majority of active workers was reportedly working indoors, thus, indoor regulations for smoking were further evaluated (table 1).

Table 2 presents the distribution of answers to the GATS question *the timing of the first smoking after wake-up*, which was used in this study as a surrogate measure for addiction tendency of the smokers. In this study, smokers who started smoking within the first 5 min of waking up were considered as having higher risk of addiction; with a prevalence ranging between 16% (in Turkey and Greece) and 26% (in Romania).

Besides direct effect of smoking on health of smokers, passive smoking is an established health hazard for smokers and non-smokers, alike.<sup>15</sup> Thus, we analyzed distribution of the answers to the GATS question *does breathing other people's smoke cause serious illness in non-smokers?* It is noteworthy that the majority (not lower than 70%) of the all participants said 'yes' to this question.

Prevalence of quit attempters varied by country of residency, ranging from 18.9% (in Greece) to 46.0% (Turkey) (table 3). Of quit attempters, the majority re-started smoking. Initiation of re-smoking was defined in the study as starting smoking again after the first quit attempt, i.e. in 12 months, at the most. Rate for initiation of re-smoking ranged between 82.5% (in Poland) and 90.2% (in Romania). It is important to note that GATS data were not useful to identify for how long the attempters did not smoke after the quit attempt.

Of all study participants who visited a physician for any reason over the 12 months preceding the survey, 50.7% (95% CI=48.9–52.4%) had been reportedly asked by the physician about their smoking status. Of all, 37.7% (95% CI=36.1–39.4%) got any advice from the physician to quit smoking; corresponding to 74.6% (95% CI=72.5–76.6%) of those enquired about their smoking status (table 4). The odds of having at least one quit attempt over the past 12 months preceding the GATS interview was 1.63 times (95% CI=1.48–1.79) among those who visited any doctor for any reason over the last 12 months compared with their counterparts who did not report any doctor visit. Similarly, among those who visited a physician, 'doctor's enquiry regarding individual's smoking status' was found to be positively associated with quit trial over the past 12 months, with an OR of 1.38 (95% CI=1.18–1.60). Among those with a visit to a physician, again, the odds ratio for quit trial was 1.31 (95% CI=1.14–1.50) comparing those

**Table 1** Distribution of basic socio-demographic characteristics of the target population (those smoking cigarettes  $\geq 12$  months prior to the GATS interview)

Variable	Crude <i>n</i>	Weighted %	Variable	Crude <i>n</i>	Weighted %
<b>Age groups (years)</b>			<b>Gender—Male</b>	11 302	69.8
15–24	1890	18.4	<b>Smoking inside home</b>		
25–34	3660	24.4	Allowed	5564	31.5
35–44	3497	21.6	Some exceptions	4186	29.6
45–54	3334	19.5	Never allowed	4772	32.4
55–64	2044	10.7	No rules	969	6.4
$\geq 65$	1082	5.4	Don't know	11	0.1
<b>Educational attainment</b>			<b>Indoor smoking at work</b>		
No formal schooling	281	1.4	Allowed anywhere	1056	10.1
Primary school graduate	2281	12.0	Allowed in some areas	3763	47.1
Secondary school graduate	1796	9.6	Not allowed	3173	36.0
High school graduate	8116	50.9	There is no policy	591	6.2
University graduate	2708	24.5	Don't know	29	0.4
Post-graduate education	307	1.5	<b>Residency</b>		
			Urban	8759	73.6

**Table 2** Distribution of a selected index for tobacco addiction and knowledge on hazards of passive smoking by country of residency

	Turkey		Greece		Romania		Poland		Ukraine		Russia		Total	
	<i>n</i>	% <sup>a</sup>	<i>n</i>	% <sup>a</sup>	<i>n</i>	% <sup>a</sup>	<i>n</i>	% <sup>a</sup>	<i>n</i>	% <sup>a</sup>	<i>n</i>	% <sup>a</sup>	<i>n</i>	% <sup>a</sup>
<b>Timing of the first smoke after wake-up (in minutes)</b>														
$\leq 5$	316	16.4	271	16.1	244	26.2	488	22.8	488	22.3	1078	22.0	2885	21.2
6–30	550	25.7	891	56.1	415	43.3	831	37.0	893	39.2	1648	36.9	5228	36.5
31–60	564	26.2	310	18.5	170	17.5	468	21.6	476	23.0	869	22.2	2857	22.5
$>60$	683	31.8	138	9.3	129	13.1	384	18.3	290	15.2	672	18.7	2296	19.7
Refused	–	–	–	–	–	–	8	0.3	8	0.4	5	0.2	21	0.2
<b>Does breathing other people's smoke cause serious illness in non-smokers</b>														
Yes	2447	94.8	1351	78.2	994	90.9	1781	69.5	1971	78.2	3567	70.9	12 111	77.1
No	109	4.4	194	11.5	88	7.5	392	14.8	266	10.3	957	20.2	2006	14.6
Not know	27	0.8	167	10.2	19	1.6	390	15.7	325	11.5	455	8.9	1383	8.3
Refused	–	–	4	0.1	–	–	1	0.0	–	–	2	0.0	7	0.0

a: Crude numbers and weighted percentages are presented.

**Table 3** Weighted percentages of participants reporting at least one quit attempt over the 12 months preceding the survey and distribution of subgroups of quitters by country of residency

	Turkey %	Greece %	Romania %	Poland %	Ukraine %	Russia %	Total %
Quit attempters	46.0	18.9	37.8	35.1	40.5	32.1	35.7
Quit, not smoking	13.1 <sup>a</sup>	16.1 <sup>a</sup>	9.8 <sup>a</sup>	17.5 <sup>a</sup>	16.6 <sup>a</sup>	11.2 <sup>a</sup>	13.1 <sup>a</sup>
Quit, re-started	86.9 <sup>a</sup>	83.9 <sup>a</sup>	90.2 <sup>a</sup>	82.5 <sup>a</sup>	83.4 <sup>a</sup>	88.8 <sup>a</sup>	86.9 <sup>a</sup>

a: Percentage out of quit attempters.

reporting that the doctor advised them 'to stop smoking' with their counterparts getting no advice.

Lastly, potential associations individuals' attempt to quit smoking were studied using multivariable logistic modeling (Supplementary table S1). Among GATS participants who were smoking 12 months preceding the survey, with a visit to a health care provider in 12 months for 'any reason' those who were asked by the physician about their smoking status had an odds of 1.55 (95% CI = 1.29–1.87) times the odds among their counterparts whose physicians did not ask about their smoking status (adjusting for country of origin, age, gender, educational attainment, current occupational status, presence of any rules against smoking in home, knowledge on harmful effects of smoking on health, knowledge on harmful effects of passive smoking on health, time for first smoke after getting up from bed).

Presence of any brief advice by the physician slightly decreased the effect of physician's enquiry on quit attempt of the smoker (OR = 1.49, 95% CI = 1.11–2.01), yet, the association remained statistically significant. In the full model (data not shown) the odds of quit attempt increased only 1.06 (95% CI = 0.81–1.39), when the physician gave a brief advice to the smoker, controlling for physician's enquiry on smoking status of the patients and other covariates. McFadden's Pseudo  $R^2$  value was 0.061 for both the full and study models, suggesting that patient sociodemographic characteristics plus contact to a physician did not explain the major fraction of variability in the odds of quit attempt among smokers.<sup>16</sup>

It is noteworthy that individuals who were aware of the harmful effects of both active- and passive smoking were significantly more likely to try to quit smoking ( $P \leq 0.01$ ). As expected, tendency to

**Table 4** Relationship between any attempt to quit smoking and presence/characteristics of any visit to a physician over the last 12 months prior to the survey

	Any quit attempts during 12 months preceding the survey?		
	Yes % (95% CI) <sup>a</sup>	No % (95% CI) <sup>a</sup>	Odds ratio (95% CI) <sup>a</sup>
<b>Any visit to a doctor</b>			
Yes (n=7174)	41.4 (39.7–43.1)	58.6 (56.9–60.3)	1.63 (1.48–1.79) <sup>1</sup>
No (n=8303)	30.2 (28.7–31.8)	69.8 (68.2–71.3)	1.00
<b>Did the physician asked about your smoking status</b>			
Yes (n=4003)	45.1 (42.8–47.6)	54.8 (52.4–57.2)	1.38 (1.18–1.60) <sup>1</sup>
No (n=3163)	37.5 (35.0–40.0)	62.5 (60.0–65.0)	1.00
<b>Did physician advise smoking cessation?</b>			
Yes (n=3117)	45.4 (42.9–48.0)	54.6 (52.0–57.1)	1.31 (1.14–1.50) <sup>1</sup>
No (n=4050)	38.9 (36.8–41.1)	61.1 (59.9–63.2)	1.00

a: Unweighted frequencies; weighted percentages/odds ratios and relevant confidence intervals are presented.

1: p-value < 0.05.

addiction was negatively associated with quit attempt, controlling for all other covariates in the model ( $P = 0.02$ ).

## Discussion

Despite all efforts to decrease smoking rates across Europe, GATS series in Europe (2009–13) revealed that current smoking rates were fairly high in all six countries: with prevalence rates of 26.7, 27.1, 28.9, 30.3, 38.2 and 39.1% in Romania, Turkey, Ukraine, Poland, Greece and Russia, respectively.

Physicians' role on smoking cessation has been found as efficacious in several randomized controlled trials,<sup>2</sup> and was confirmed with observational studies. Zhang *et al.* worked with 3437 smokers and asked the influence of Canadian health workers in quitting smoking. Making a quit attempt and long-term quitting (>6 months) increased by receiving advice by health professionals.<sup>17</sup> Clawson *et al.* showed that doctors play crucial role in adolescents' smoking patterns. Doctors' interventions provided good benefits for young African American people in terms of less intention to smoke, higher quit rates and less relapse.<sup>18</sup>

Despite conclusive evidence on physician's positive effect on smoking cessation, literature suggests that advice on smoking may still not be offered systematically, even at settings where provision of lifestyle advice within the medical consultation is promoted as a matter of routine.<sup>19,20</sup>

### Reflection on main findings

It was remarking in our study that only about half of the smokers had been asked by their physicians about their smoking status. Both undergraduate curricula and in-service training programs of physicians should emphasize the importance of getting information on health-related risk factors during routine medical history taking.

Our findings confirmed physicians' invaluable role in quitting smoking, and revealed that any visit to a physician might be used as an advantage to approach a smoker, to motivate him/her to quit smoking. Physicians should be motivated for fulfilling their significant role in quitting services as part of global tobacco control activities. Potential barriers to their performance (e.g. lack of knowledge about cessation treatment, insufficient reimbursement services) should be eliminated.<sup>21</sup>

Our *a priori* expectation was to see a positive dose–response effect on quit attempt, in parallel to 'exposure' to the physician. Given that GATS data did not provide any information on the content of the quit advice given by the physician, we could not further study why getting an advice from physician to quit smoking did not make a significant gain over 'asking for smoking status' of the participants. This may, at least be partially, explained by study participants' recall bias or under-reporting of physician's inquiry on smoking.

It is noteworthy that a variety of factors may modify/confound the association between quit attempt of a smoker and his/her exposure to a physician, or at least the size of such an effect. It is possible that contact with a physician might have had direct/indirect effect on quit attempts. Smokers who visit a doctor compared with those who do not may have poorer health, which may also be a motivation to quit. In studying effectiveness of various interventions for smoking cessation, it will be valuable to collect information on (physical, social, cultural and political) environmental factors, individual characteristics, availability/accessibility/acceptability of health care services, etc.

Lastly, variation in years of GAT surveys across countries might have also confounded the associations studied. Date of the survey was tested in models as a significant predictor of quit attempt, but was not significant, when controlled for country. A cohort effect could have been studied more efficiently, had we included repeated GAT surveys in these countries, yet, not all of the countries included in the study had repeated survey data.

### Limitations of this study

Secondary nature of the data analyzed and retrospective nature of the original GATS interviews led to some intrinsic limitations in interpretation of the study findings. We were not able to investigate the temporality between the dates of doctor visit and the quit attempt. Both questions were asked for 'the last 12 months preceding the GATS interview'; it is possible that some of the attempts might have preceded the doctor visit during this 12-month period. This issue needs to be confirmed in future cohort studies.

Another potential bias is linked to our inability to further investigate 'why the participant visited a physician'. The questionnaire inquired on 'all admissions, regardless of the reason'. It is more likely that participants with chronic diseases/poor health status might have visited a physician more than their healthier counterparts, and patients with poor health might have been asked more frequently for their smoking history and advised more by their doctors to quit smoking, compared with their counterparts without chronic diseases. In parallel, these patients were more likely to quit, when they were advised so by their doctors. Similarly, individuals who quitted/attempted to quit smoking could have recalled their visit to a doctor/the doctor's advice on quitting much better than their counterparts. Such a reporting bias might have led to an over-estimation of the true effect size (if any) for the association between doctor visit/doctor's advice and quit smoking, with a non-differential bias away from the null.

Lastly, limitations of self-report, including recall bias, to provide valid information on exposure and/or outcome, together with potential confounding due to variables that were not studied as

part of the GAT survey, cannot be ruled out in this study. Future studies are clearly warranted for in-depth analysis of the reasons for admission to a health care facility, physicians' motive in asking smoking history of the patient and the content of the physician's advice for smoking cessation (if any).

### Strengths and assets of this study

This study is novel in studying study hypotheses in a large, heterogeneous, yet comparable, population-based database and revealed 'effectiveness' of physician enquiry and advice on quit attempts among smokers. The size of the study population, representativeness of the sample, use of standardized questions enabled some hypothesis testing, and also provided valuable insights with regard to improving the GATS questionnaires.

GAT surveys are primarily designed to get prevalence estimates for smoking (cigarettes and/or other tobacco products) and not pursue to test specific hypotheses. This study is one of the pioneer studies, that used pooled data to test hypotheses beyond the original goal of GAT surveys and the authors hope to motivate international researchers to plan/conduct/analyze results of international prevalence surveys to enable risk analysis and/or analysis of country-specific, across-countries preventive interventional activities. We would like to motivate future GATS researchers to add a couple of more questions on potential confounders to enable some further hypothesis testing as part of these prevalence surveys. Such an effort will definitely increase the efficiency of prevalence surveys and rationalize the high cost of such surveys for one-time prevalence estimations.

### Supplementary data

Supplementary data are available at *EURPUB* online.

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### Key points

- This study is based on secondary data analysis of GATS data, and provides clues on frequency of quit attempts among smokers and physician's role on these in selected WHO European Region countries.
- Our findings confirmed the effectiveness of physician's enquiry about smoking status (besides a brief advice) on smoking cessation, as part of routine health services.
- There is still a need to increase the frequency with which smokers are identified and offered advice and support by physicians.

- Our findings also highlight the need for more detailed studies to understand the differences in quit rates and related factors across countries.

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