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Changes in the prevalence of cigarette smoking and quitting smoking determinants in adult inhabitants of rural areas in Poland between 2003 and 2012

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ABSTRACT

Objectives: We investigate trends in the prevalence of cigarette smoking among adults at all ages in two time points 9 years apart in two neighbouring rural populations and examine social and respiratory health determinants of quitting smoking.
Study design: Repeated cross-sectional study.
Methods: Two cross-sectional surveys were conducted in the same rural area of lower Silesia in Poland in 2003 and 2012. A total of 1328 (91% of adult eligible individuals) in 2003 and 1449 (92% of eligible) in 2012 adult inhabitants were surveyed, 908 people (560 villagers and 348 town inhabitants) participated in both surveys. Participants completed a questionnaire on smoking behaviour, education level and respiratory diseases.
Results: Current smoking was higher in the villages than the town, among men than women and those with a middle level of education. The prevalence of current smokers decreased over time, although this decline was much more pronounced in the town than in the villages (30.2% vs 23% and 35.5% vs 33.7%, respectively). Men were more likely to stop smoking than women both in villages and in town. The prevalence of current smokers among village women even increased between the two surveys from 27.6% to 29.3%. Respiratory diseases did not influence quitting smoking.
Conclusions: The degree of decreasing trend in smoking prevalence varied considerably within neighbouring populations. It was mainly seen in the town and among younger people. Men and those better educated were more willing to quit smoking. The discrepancies between two close rural populations indicates the need for an individual approach when designing programs of tobacco control.

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Introduction

Almost 700,000 deaths among European citizens per year are the consequence of cigarette smoking.[1] According to the European Commission, smoking costs the EU countries at least €100 billion per year and causes more health problems than alcohol, drugs, high blood pressure, excess weight or high cholesterol combined.[1] Despite the considerable successes in reducing tobacco exposure in recent years, the number of smokers in the EU is still relatively high, comprising 28% of the population.[1] Poland is one of the countries with the highest death rates due to cigarette smoking, with approximately 69,000 deaths per year, of which approximately 43,000 are premature deaths in people aged 35–69 years.[2] It is estimated that there are nine million tobacco smokers in Poland, representing 30.3% of the country's adult population.[2] These numbers were even higher in the past.[3]

Together with political, economical and sociological changes initiated in Poland in the early 1990s, social acceptance of smoking noticeably decreased. This change in attitude towards smoking was possible due to greater public awareness of health risks, numerous public campaigns against smoking and economic decisions including raising taxes on cigarettes which made them less accessible financially. All these factors have contributed to the fact that, from the 1990s, the number of smokers in Poland has markedly decreased.[2] However, in recent years there has been a slowdown in the declining trend, and in some populations the number of smokers has even increased. In the Global Adult Tobacco Survey (GATS) conducted in 2009–2010 in 16 countries, current smoking prevalence among women was the highest in Poland (24.4%)[4]. Distinct differences between Polish big cities and village inhabitants' smoking habits were also reported recently.[5]

In this article, we investigate trends in the prevalence of cigarette smoking among adults at all ages in two time points 9 years apart in two neighbouring places of residence in a rural area of south-west Poland. In addition, we examine social and respiratory health determinants of quitting smoking among individuals living in these two locations between 2003 and 2012.

Methods

Two cross-sectional surveys were conducted in the same rural area of lower Silesia in Poland in 2003 and 2012. All inhabitants aged 5 years or more were eligible. For the purpose of this article, we restricted the analyses to adults aged 18 years or more. They were inhabitants of seven small villages and two randomly selected areas of a nearby small, market town of about 4000 people.

We used exactly the same instruments in both surveys. All family members completed, with the aid of a nurse interviewer, a questionnaire on respiratory and allergic symptoms and smoking behaviour currently and in the past. We also gathered information on potential confounders or effect modifiers including sex, place of living, parental and maternal smoking and education (categorized according to the Polish three-level school system).

Participants were considered ever smokers if they reported smoking at least one cigarette per day for at least one year. Ever smokers were divided into current smokers (do you currently smoke cigarettes?) and ex-smokers (if they had stopped smoking before the survey). We also recorded the duration of smoking in years and age of smoking initiation.

Asthma and hay fever were defined as a positive answer to the question about the doctor's diagnosis of these conditions. Atopy was defined as a positive result (wheal of mean diameter 3 mm or more than the response to saline) of skin prick tests (house dust mite, cat fur, mixed grass and tree pollens, ALK-Abello, Hungerford, Berkshire, UK). We asked about chronic cough (do you usually cough during the day—or at night—in the winter?), exercise-induced symptoms (does exercise give you wheezing or whistling in the chest?), inhaler use (in the past 12 months, have you taken inhalers for breathing or for respiratory problems prescribed by doctor?) and bronchitis diagnosis ever (has a doctor ever told you that you have bronchitis?).

Ethical approval was obtained from the Ethics Committee at the Wroclaw Medical University; each participant provided signed consent.

Statistical methods

We estimated crude and adjusted prevalence odds ratios for being ever or ex-smoker using logistic regression, adjusting for age, sex, location and school education years (identified *a priori* as potential confounders). All analyses were performed with IBM SPSS Statistics 20 package.

Results

A total of 1328 (91% of adult eligible individuals) in 2003 and 1449 (92% of eligible) in 2012 adult inhabitants completed a questionnaire. The response rate was similar in villages and town (in 2003 89% in villages vs 93% in town and in 2012 89.6% vs 94.9% respectively); 908 people (560 villagers and 348 town inhabitants) participated in both surveys.

The characteristics of the village and town participants are shown in Table 1. Townspeople were slightly older than those from the villages, and older in 2012 than in 2003. Participants were more often female in both locations and in both surveys. The proportion of higher educated inhabitants was greater in the town than in the villages both in 2003 and 2012. In 2003, the prevalence of ever smokers was similar in town (53.9%) and villages (53.7%). Nine years later it slightly dropped in town to 48.4% and remained stable in villages (53.9%).

Current smoking was higher in the villages than the town (in 2003 35.8% vs 30.2% and in 2012 33.7% vs 23.0%, respectively), higher among men than women in both locations and in both years; it was also higher among those with a middle level of education than those with basic level and academic degree (Table 2). The differences between the villages and town communities with respect to current smoking were evident at all ages, and in both surveys, but particularly in

Table 1 – Characteristics of study population (adults 18 years and older).

Study population	Sobótka		Villages	
	2003	2012	2003	2012
Eligible: *n*	620	764	839	808
Surveyed: *n* (%)	579 (93.4%)	725 (94.9%)	749 (89.3%)	724 (89.6%)
Female: *n* (%)	332 (57.3%)	422 (58.2%)	413 (55.1%)	392 (54.1%)
Age in years: median (range)	45 (18–86)	50 (18–99)	42 (18–92)	46 (18–92)
18–30	24	24	23	24
31–40	36	34	36	36
41–50	46	47	45	45
51–60	54	56	54	55
>60	69	65.5	70	71
Education:				
<8 years	58 (10.1%)	38 (5.2%)	167 (22.4%)	109 (15.1%)
8–12 years	254 (44.0%)	349 (48.1%)	397 (53.2%)	378 (52.2%)
>12 years	265 (45.9%)	338 (46.6%)	182 (24.4%)	237 (32.7%)
Smoking:				
Never smoker	267 (46.1%)	374 (51.6%)	347 (46.3%)	334 (46.1%)
Ex-smoker	137 (23.7%)	184 (25.4%)	134 (17.9%)	146 (20.2%)
Current smoker	175 (30.2%)	167 (23.0%)	268 (35.8%)	244 (33.7%)

2012 for subjects in all age groups under 60 years. The median age of smoking initiation among current smokers did not differ significantly among village and town inhabitants, and it was 18 years in both locations.

The prevalence of current smokers decreased over time in both locations, although this decline was much more pronounced in the town than in the villages (Table 2). In the youngest age group (18–30 years) in town, 31% of the participants in 2003 reported being current smokers; this dropped to 20% 9 years later. In contrast, there was only a slight reduction in smoking prevalence among young villagers (36.5% in 2003 vs 31.9% in 2012). Among villagers the most pronounced decline in current smoking prevalence was in those aged 41–50 years. There was a slight increase in smoking prevalence among inhabitants in older age groups in both locations. The decline in smoking among townspeople was the most pronounced among those with the highest education level. Men were more likely to stop smoking than women both in villages and in town. The prevalence of current smokers among village women even increased between the two surveys from 27.6% to 29.3%. This was most pronounced among young women aged 18–30 years (22.0% in 2003 vs 32% in 2012) and those aged 51–60 years (32.0% vs 50.5%, respectively; not shown in the table).

The odd ratios of being a current smoker were much higher if another household member was also a smoker both in town (OR 2.33; 95% CI 1.59–3.40 in 2003 and OR 2.36; 95% CI 1.63–3.43 in 2012) and in the villages (OR 2.82; 95% CI 1.98–4.00 in 2003 and OR 2.55; 95% CI 1.81–3.60 in 2012). There was also a non-significant positive association with family smoking history. In the subgroup of 231 participants with the history of parental smoking, the odds ratios of being smoker were OR 2.54 (95% CI 0.77–6.63) for those whose father smoked, OR 1.55 (95% CI 0.38–6.27) for those whose mother smoke and OR 2.01 (95% CI 0.71–5.67) for both smoking parents in respect to the children of non-smoking parents (OR = 1.0; reference category).

Among respiratory symptoms chronic cough in winter was the strongest positively related to current smoking in both surveys (Table 3). The highest prevalence of chest wheeze after exercise was found among ex-smokers. The prevalence of doctor-diagnosed asthma and hay fever increased slightly from 2003 to 2012 among non-smokers and ex-smokers and did not change among current smokers. Atopy prevalence increased significantly, as described in a previous publication.[6] The prevalence of asthma diagnosed by the doctor was slightly higher among never and ex-smokers than current smokers in both surveys.

In the multiple regression analysis, the probability of being an ever smoker were significantly lower in women than in

Table 2 – Current smokers by place of living, year of the study and selected characteristics (adults 18 years and older who are current smokers).

Current smokers	Sobótka			Villages			*P*-values	
	2003	2012	*P*	2003	2012	*P*	a)	b)
No. of current smokers *n* (%)	175 (30.2%)	167 (23.0%)	P = 0.003	268 (35.5%)	244 (33.7%)	P = 0.402	P = 0.033	P < 0.001
Male	90 (36.4%)	71 (26.1%)	P = 0.009	154 (45.8%)	129 (38.9%)	P = 0.068	P = 0.023	P = 0.001
Female	85 (25.5%)	88 (20.9%)	P = 0.124	114 (27.6%)	115 (29.3%)	P = 0.586	P = 0.540	P = 0.005
Age group in years:								
18–30	52 (31.0%)	33 (20.0%)	P = 0.003	72 (36.5%)	63 (31.9%)	P = 0.616	P = 0.261	P < 0.001
31–40	19 (28.8%)	30 (26.3%)	P = 0.720	67 (44.1%)	49 (37.4%)	P = 0.255	P = 0.034	P = 0.064
41–50	46 (35.4%)	19 (22.1%)	P = 0.037	84 (52.8%)	39 (33.3%)	P = 0.001	P = 0.003	P = 0.080
51–60	46 (31.5%)	47 (27.3%)	P = 0.414	34 (37.8%)	71 (44.9%)	P = 0.273	P = 0.323	P = 0.001
>60	12 (17.4%)	38 (20.2%)	P = 0.613	11 (7.1%)	22 (14.0%)	P = 0.056	P = 0.023	P = 0.130
	P = 0.123	P = 0.377		P < 0.001	P < 0.001			
Education:								
<8 years	15 (25.9%)	5 (13.2%)	P = 0.134	23 (13.8%)	17 (15.6%)	P = 0.674	P = 0.034	P = 0.717
8–12 years	88 (34.6%)	102 (29.2%)	P = 0.157	187 (47.1%)	159 (42.1%)	P = 0.158	P = 0.002	P < 0.001
>12 years	72 (27.2%)	60 (17.8%)	P = 0.006	58 (31.9%)	68 (28.7%)	P = 0.482	P = 0.283	P = 0.001
	P = 0.133	P = 0.001		P < 0.001	P < 0.001			
Age in years of initiation of smoking (median, range)	18 (10–42)	18 (15–50)		18 (14–40)	18 (12–43)		P = 0.019	P = 0.137

a): chi-squared test comparing Sobotka 2003 and villages 2003.
b): chi-squared test comparing Sobotka 2012 and villages 2012.

Table 3 – Prevalence of asthma, hay fever, atopy and respiratory symptoms by study year and smoking habits.

Disease or symptom	Year	Never smokers		Ex-smokers		Current smokers	
		n (%)	*P*-value	*n* (%)	*P*-value	*n* (%)	*P*-value
Asthma diagnosed by the doctor	2003	26 (4.2%)	$P = 0.198$	12 (4.2%)	$P = 0.463$	17 (3.8%)	$P = 0.593$
	2012	41 (5.8%)		19 (5.8%)		13 (3.2%)	
Hay fever	2003	29 (4.7%)	$P = 0.011$	11 (4.1%)	$P = 0.163$	20 (4.5%)	$P = 0.940$
	2012	58 (8.2%)		22 (6.7%)		19 (4.6%)	
Atopy	2003	86 (14.4%)	$P = 0.004$	29 (11.0%)	$P = 0.007$	39 (8.9%)	$P < 0.001$
	2012	142 (20.5%)		61 (19.1%)		69 (17.5%)	
Cough in the winter	2003	136 (22.1%)	$P < 0.001$	58 (21.4%)	$P = 0.323$	139 (31.4%)	$P < 0.001$
	2012	94 (13.3%)		60 (18.2%)		85 (20.7%)	
Wheezing or whistling in the chest after exercise	2003	47 (7.7%)	$P = 0.055$	34 (12.5%)	$P = 0.135$	41 (9.3%)	$P = 0.029$
	2012	36 (5.1%)		29 (8.8%)		22 (5.4%)	
Inhalers prescribed by doctor	2003	33 (5.4%)	$P = 0.636$	13 (4.8%)	$P = 0.164$	10 (2.3%)	$P = 0.039$
	2012	34 (4.8%)		25 (7.6%)		20 (4.9%)	
Bronchitis ever	2003	242 (39.4%)	$P < 0.001$	99 (36.5%)	$P = 0.613$	155 (35.9%)	$P < 0.001$
	2012	214 (30.2%)		114 (34.5%)		121 (29.4%)	

men in both surveys and both locations (Table 4). Age-stratified analyses indicated that the probability of being an ever smoker was highest in people aged 41–60 years, both in villages and town. Those with a middle education level had significantly higher odds for ever smoking. This was stronger for villagers but was also seen in town inhabitants in 2012.

The odds of being an ex-smoker increased with age in both surveys in town and in villages (Table 4). Sex affected the likelihood of quitting smoking in both locations, although it was more pronounced in the villages. Among village women, the odds ratios of smoking cessation were lower comparing to men as a reference category: OR 0.43 (95% CI 0.29–0.63) in 2003 and OR 0.50 (95% CI 0.35–0.72) in 2012. Education level and respiratory and allergic symptom did not modify significantly the odds of being ex-smoker.

A further analysis confined to those 908 participants who had taken part in both surveys, showed that 66 (26.8%) out of 246 smokers in 2003 quitted smoking by 2012. Place of residence was the strongest factor influencing change in smoking habits. Town inhabitants had an elevated odds ratio for being an ex-smoker OR 2.37 (95% CI 1.32–4.25) compared to those living in the villages as a reference group (Table 5). Sex, education level and age were non-significantly associated with smoking cessation. For those who reported chronic, winter cough, the OR of being ex-smoker was significantly lower 0.36 (95% CI 0.15–0.85); other respiratory symptoms did not significantly influence smoking cessation.

Discussion

We found that the prevalence of current smoking was higher in villages than in the nearby small town. The decrease in the prevalence of current smoking among inhabitants of rural areas in Poland has been confirmed. This was much more pronounced in town inhabitants than in villagers, in men than in women and among people in younger age groups. These declines were also confirmed in analyses confined to those individuals who participated in both surveys. In fact, the prevalence of current smoking slightly increased among village women. Respiratory diseases, such as asthma and bronchitis, did not influence quitting smoking. From all respiratory symptoms, chronic cough was the most typical for current smokers.

Some of the limitations of these data should be considered. Reports of smoking status were based on questionnaire responses and were not verified with biochemical methods. Self- reporting of smoking status may lead to some underestimation of smoking prevalence, as it was showed in the international study comparing biochemically assessed and self-reported smoking rates, where in Poland this underestimation was at the level of 4%, and it was higher than in England and the USA.[7] On the other hand, we used exactly the same methodology in both surveys. Another weakness of the study is the lack of sociological information on factors which are known to possibly influence smoking habits, such as family income or occupation, although, to some extent, these may be reflected in education level. Moreover, relatively small sample size limits the precision of the analyses, especially those in stratified groups. On the other hand, strength of this study is its relatively high response rates and the considerable participation of exactly the same individuals in both surveys.

The results of the previous studies comparing rural and urban differences in terms of smoking yielded conflicting results. In Germany, for example, in the study using nationwide census including 181,324 subjects over 10 years old, the inhabitants of urban areas were more likely to be current smokers than those living in rural areas.[8] In the surveys from Canada and the USA, smoking prevalence tends to increase in rural settings.[9,10] In our study the prevalence of smoking differed, more evident in 2012, between two populations living in a close proximity. Tobacco use was higher among villagers than the inhabitants of a nearby small, market town. These findings are different from the results of Polish part of GATS, where the residents of urban areas smoked more frequently than inhabitants of rural areas. That study was conducted in the cities of varying size and showed that the larger the city, the higher percentage of smokers, this was particularly expressed among woman.[11]

In our survey a clear difference in the trend of smoking cessation within nine years between the villages and the

Table 4 – Odd ratios of smoking initiation in 2003 and 2012 and being ex-smoker in 2003 and 2012 [logistic regression models—OR (95% CI) of being ever smoker and being ex-smoker].

Smokers characteristics	Ever-smokers				Ex-smokers			
	Sobótka		Villages		Sobótka		Villages	
	2003	2012	2003	2012	2003	2012	2003	2012
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Females	0.49 (0.35–0.68)	0.66 (0.49–0.89)	0.28 (0.21–0.38)	0.43 (0.32–0.58)	0.69 (0.47–1.02)	0.76 (0.55–1.07)	0.43 (0.29–0.63)	0.50 (0.35–0.72)
Age in years: (adjusted for sex)								
18–30	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
31–40	1.41 (0.78–2.53)	1.24 (0.76–2.02)	1.78 (1.14–2.79)	1.51 (0.94–2.42)	2.47 (1.08–5.69)	0.87 (0.45–1.69)	1.54 (0.83–2.86)	2.97 (1.37–6.41)
41–50	3.31 (2.03–5.40)	1.66 (0.98–2.83)	2.53 (1.60–3.99)	1.66 (1.01–2.71)	5.16 (2.66–10.01)	1.81 (0.97–3.39)	1.50 (0.82–2.75)	4.59 (2.17–9.69)
51–60	3.18 (1.98–5.10)	2.39 (1.54–3.71)	2.05 (1.20–3.53)	2.89 (1.81–4.63)	5.96 (3.12–11.37)	2.16 (1.28–3.63)	2.94 (1.55–5.56)	4.74 (2.32–9.68)
>60	1.24 (0.69–2.20)	2.08 (1.35–3.19)	0.51 (0.32–0.82)	0.94 (0.60–1.48)	4.15 (1.94–8.90)	2.56 (1.54–4.26)	2.54 (1.40–4.61)	6.04 (2.96–12.32)
Education: (adjusted for age, sex)								
<8 years	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
8–12 years	1.45 (0.76–2.77)	2.54 (1.24–5.20)	3.47 (2.01–5.99)	3.46 (2.00–5.99)	1.45 (0.73–2.89)	1.56 (0.72–3.40)	1.34 (0.74–2.57)	2.16 (1.14–4.10)
>12 years	1.04 (0.52–2.08)	1.63 (0.78–3.44)	1.35 (0.72–2.54)	1.84 (1.00–3.40)	1.60 (0.74–3.43)	1.71 (0.76–3.87)	0.93 (0.43–2.02)	2.28 (1.09–4.79)
Asthma (doctor diagnosed)[a]	1.23 (0.54–2.81)	0.64 (0.31–1.32)	0.93 (0.42–2.05)	0.73 (0.38–1.42)	0.61 (0.21–1.73)	0.90 (0.40–2.05)	1.32 (0.53–3.28)	1.18 (0.54–2.54)
Hay fever[a]	1.26 (0.64–2.48)	1.37 (0.76–2.48)	0.88 (0.35–2.20)	0.36 (0.19–0.70)	0.69 (0.27–1.75)	1.78 (0.95–3.36)	1.54 (0.54–4.40)	0.52 (0.19–1.39)
Atopy[a]	0.68 (0.43–1.08)	0.88 (0.60–1.30)	0.60 (0.33–1.10)	0.93 (0.62–1.38)	0.98 (0.56–1.71)	1.04 (0.66–1.65)	1.11 (0.51–2.39)	1.37 (0.83–2.24)
Cough in the winter[a]	1.15 (0.77–1.72)	1.33 (0.89–1.98)	1.67 (1.16–2.39)	1.91 (1.24–2.96)	0.47 (0.28–0.78)	1.20 (0.77–1.87)	0.88 (0.56–1.39)	0.75 (0.44–1.28)
Wheezing or whistling in the chest after exercise[a]	1.44 (0.73–2.82)	1.15 (0.60–2.17)	1.63 (0.98–2.72)	1.45 (0.76–2.77)	0.70 (0.32–1.51)	1.51 (0.78–2.93)	1.90 (1.09–3.29)	1.51 (0.74–3.09)
Inhalers prescribed by doctor[a]	0.51 (0.23–1.16)	1.56 (0.77–3.15)	0.79 (0.36–1.74)	1.08 (0.56–2.07)	0.61 (0.22–1.70)	1.88 (0.94–3.76)	1.73 (0.70–4.25)	0.95 (0.42–2.13)
Bronchitis ever[a]	1.01 (0.72–1.42)	0.95 (0.70–1.29)	0.88 (0.63–1.22)	1.44 (1.02–2.04)	0.88 (0.59–1.32)	0.97 (0.68–1.39)	1.08 (0.71–1.65)	1.45 (0.96–2.19)

OR, odds ratio; CI, confidence interval.
[a] Adjusted for sex, age and education.

Table 5 – Odd ratios of being ex-smoker in 2012 among those who smoked in 2003 and participated in both surveys (logistic regression models—OR (95% CI) of being ex-smoker).

Ex-smokers characteristics	OR (95% CI)
Females	0.84 (0.48–1.48)
Age in years (adjusted for sex and location)	
18–30	1 (ref.)
31–40	0.47 (0.13–1.69)
41–50	1.21 (0.39–3.75)
51–60	0.68 (0.22–2.05)
>60	0.69 (0.21–2.32)
Town	2.37 (1.32–4.25)
Education (adjusted for age, sex and location)	
<8 years	1 (ref.)
8–12 years	2.02 (0.47–8.74)
>12 years	3.20 (0.71–14.51)
Asthma (doctor diagnosed)[a]	2.10 (0.46–9.62)
Hay fever[a]	2.15 (0.72–6.45)
Atopy[a]	1.13 (0.51–2.51)
Cough in the winter[a]	0.36 (0.15–0.85)
Wheezing or whistling in the chest after exercise[a]	1.26 (0.42–3.77)
Inhalers prescribed by doctor[a]	1.39 (0.40–4.77)
Bronchitis ever[a]	1.08 (0.58–2.02)

OR, odds ratio; CI, confidence interval.
[a] Adjusted for sex, age and education.

town was found. A decline in smoking prevalence was clearly seen in the town (Sobotka). Current smoking declined the most among well educated and younger people. This was in line with trends observed in many European countries,[12,13] which supports the view that anti-tobacco consumption initiatives may have been more effective among high educated and younger people. In the GATS study in Poland, the most frequent reason for the decision of giving up smoking, given by former smokers, was that they realized that smoking is harmful.[14] In the same time in our study, the prevalence of current smoking decreased only slightly in villages and among village women even increased. This was in stark contrast with the trend in the neighbouring small town. The way of life and source of income of rural residents in this area has changed distinctly in recent years. After joining the European Union in 2004 it became uneconomic for many small farmers living in our villages to continue farming and they had to look for other sources of income. Many became unemployed, and it is likely that life became more stressful for them. It was shown previously that stressful events may increase the proportions of current smokers.[15] The prevalence of smoking among village people has increased among those with the lowest level of education and among individuals over 50 years of age. We can speculate that those people could have more difficulties in finding themselves in these new circumstances and/or they may be less sensitive to governmental and social anti-tobacco strategies and programs. On the other hand, economical reasons may also have an influence on the decision about continuing or quitting smoking. Cigarettes became less affordable as the result of tax and price increase. In GATS study, the higher price of cigarettes was the main motivation to stop smoking for 13% of Polish ex-smokers.[14]

In our study, the decline in smoking prevalence was more pronounced among men than women. The similar trend has been reported elsewhere.[16] Sex disparities in smoking prevalence, although still exist, seemed to align, especially in high-income countries, but this process has started also in middle-income countries like Poland. Poland is among the countries with particularly high rate of smoking women.[4] In major cities the smoking prevalence among women has becomes equivalent to that among men.[14] According to a WHO report on smoking in Poland the percentage of women who smoke daily in rural areas has increased 2.5-fold over the past 30 years.[2] Our findings of increased prevalence of smoking women in the villages also confirm this trend. Higher social acceptance of smoking among rural women and their emancipation contribute to this growth.

In the family context, not surprisingly and in line with observations from elsewhere,[17,18] the risk of being a smoker in our study was higher among those living in the household with other smokers and whose parents were smokers. This shows that higher acceptance of such behaviour in the family may influence the decision to start smoking in younger people.

The prevalence of asthma, atopy and hay fever did not differ significantly between current, ex- and never smokers in our study. Among respiratory symptoms chronic winter cough was the most frequent among current smokers compared to ex- and never smokers and the prevalence of this symptom decreased between 2003 and 2012. The similar trend was seen in a Swedish study on respiratory symptoms and their relations to smoking.[19] Among all respiratory symptoms chronic cough was the only factor which increased the risk of continuing, not quitting smoking in the group of those inhabitants who participated in our both surveys.

In conclusion, despite the considerable progress in tobacco control in Poland that has been made in recent years, there are still many challenges to be addressed. Our findings confirmed the decreasing trend in smoking prevalence, but the degree of this decline varied considerably within rural neighbouring populations. It was mainly seen in the town and among younger people. The reduction in smoking prevalence among village inhabitants between the two surveys was very weak and not present among village women. Men, and those better educated, were more willing to quit smoking, but the presence of respiratory symptoms did not influence significantly smoking cessation. The discrepancies in smoking behaviour between two close rural populations indicate the need for an individual approach when designing programs of tobacco control.

Author statements

Ethical approval

Ethics Committee at the Wroclaw Medical University.

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Competing interests

None declared.

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