

## PREVALENCE OF CIGARETTE SMOKING AMONG ADULT POPULATION IN EASTERN POLAND

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Panasiuk L, Mierzecki A, Wdowiak L, Paprzycki P, Lukas W, Godycki-Ćwirko M: Prevalence of cigarette smoking among adult population in eastern Poland. *Ann Agric Environ Med* 2010, **17**, 133–138.

**Abstract:** Cigarette smoking is the strongest modifiable factor, which shortens the life span and deteriorates the quality of life. It increases the risk of development of cancer, cardiovascular and respiratory system diseases. The objective of the study was evaluation of the prevalence of cigarette smoking among the adult population of the Lublin Region, and investigation of the relationship between nicotine use and respondents' place of residence, and other selected socio-economic factors. Data concerning the cigarette smoking habit was obtained from 3,993 people – 2,447 females and 1,546 males; 23.0% of respondents in the study were smokers – 35.6% of males and 15.1% of females. The percentage of male smokers was similar in rural and urban areas. Urban females were smokers more often than those living in rural areas. A decrease was noted in the difference which has been observed to-date between the percentage of urban and rural female smokers. The highest percentage of smokers occurred among the population aged 41–50, while the lowest – among the youngest and the oldest respondents. The percentage of smoking farmers was lower than that of respondents performing non-agricultural occupations, also among rural inhabitants. Those who were occupationally active were smokers more frequently than those not engaged in occupational activity. The lowest percentage of smokers was noted among respondents who had the highest education level, while the highest percentage was observed among those who had vocational education.

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**Key words:** cigarette smoking, place of residence, socio-economic conditioning.

### INTRODUCTION

Tobacco smoke is a mixture of approximately 6,000 various chemical compounds, the majority of which are toxic substances, over 60 of which have carcinogenic properties [2]. Smokers are at increased risk of the development of cancer concerning: the lungs, oral cavity, thorax, oesophagus, stomach, spleen, kidneys and urinary bladder [1, 19, 25, 30, 31]. It is estimated that tobacco smoke is almost

90% responsible for the development of lung cancer, which in the majority of the developed countries worldwide, including Poland, occupies the first position among the types of cancer causing death in males, and the second position among cancers causing death in females [7, 12, 26]. Everyday cigarette smoking increases so-called coronary risk, the frequency of occurrence of stroke and sudden cardiac death [9, 27, 33]. Tobacco smoking increases the frequency of occurrence of bronchial asthma and chronic obstructive

pulmonary disease (COPD) [14, 28]. Tobacco smoking, including passive smoking, by pregnant women unfavourably affects the development of the foetus [4, 34]. Despite the fact that tobacco smoking is the strongest modifiable factor shortening life span and deteriorating the quality of life, the prevalence of this habit still remains high. According to the data by the WHO, in 2007 in the world, as many as 37.0% of males and 23.0% of females were active smokers [35]. Few studies have been conducted in Poland comparing the prevalence of the cigarette smoking habit between rural and urban populations, and the results of these studies have been contradictory. Similarly, there have also been contradictory reports from other countries [13, 14, 24, 29, 36].

### OBJECTIVE

The objective of the presented study was evaluation of the prevalence of the tobacco smoking habit among adult inhabitants of the Lublin Region (eastern Poland), and comparison of the results obtained with the results of earlier investigations carried out in this and other regions of Poland. In addition, the aim of the study was to compare the prevalence of nicotine addiction among rural and urban inhabitants, and to discover whether there exists a relationship between the occurrence of this habit, gender, age, occupation performed, occupational activity and level of education.

### MATERIAL AND METHODS

The study was conducted during the period April-June 2006. The sample for the study was selected by the method of double-sampling. Among 610 primary health facilities in the Lublin Region 51 units were selected – 32 rural and 19 urban, and a group of 2% of the adult population was selected who were provided with care by an individual facility. In Poland, 97.25% of the population is registered with primary health care facilities; therefore, the selection of the sample based on patient lists from these facilities ensured that the study was representative. The study covered 3,993 patients, which constituted about 80% of the population selected.

After obtaining consent for participation in the study, patients were invited to primary health care facilities where trained staff conducted a survey concerning cigarette smoking and selected socio-economic factors: age, gender, place of residence, occupation performed, occupational activity and educational level.

The group of smokers, apart from regular smokers, also covered those who smoked occasionally, while the group of non-smokers covered both never-smokers and those who had discontinued the habit.

Analysis of the material obtained was performed by means of Statistica 8.0 package. Contingency tables were analysed with the use of Pearson's chi-square test.

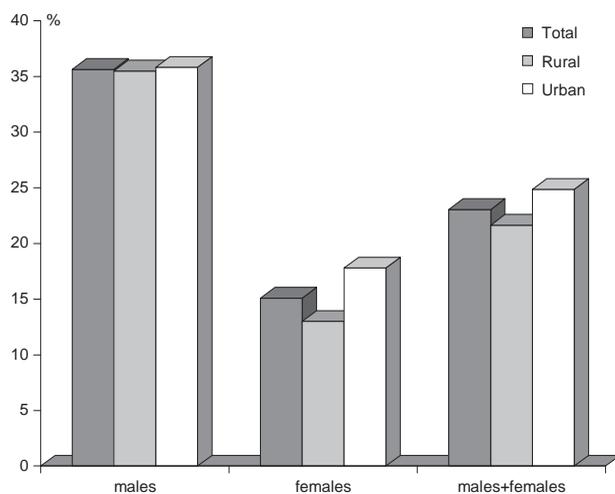
### RESULTS

Data concerning the cigarette smoking habit was obtained from 3,993 people – 2,447 females and 1,546 males. The mean age of females in the study (52.5) was higher than that of males (50). The study covered 2,250 rural and 1,743 urban inhabitants. The mean age of the rural inhabitants (51.57) was higher than that of the urban population (50.59). The mean age of rural males was slightly higher (50.05) than that of urban males (49.93). The mean age of rural females was slightly higher (52.52), compared to urban females (51.20). As many as 2,552 people performing non-agricultural occupations, and 1,117 farmers participated in the study. The mean age of the farmers examined was clearly higher (56.09), compared to people who performed non-agricultural occupations (50.32). There were 1,814 active and 2,179 non-active occupationally respondents. 27.3% of respondents possessed incomplete elementary or elementary education level, 23.6% – completed vocational schools, 35.5% – had secondary or post-secondary education and 13.6% – university education/licentiate. Mean age of patients possessing incomplete elementary or elementary education level was 63.87, and was clearly higher than among those with vocational school education (48.06), followed by secondary school/post-secondary school education (46.59) and university/licentiate education (44.36).

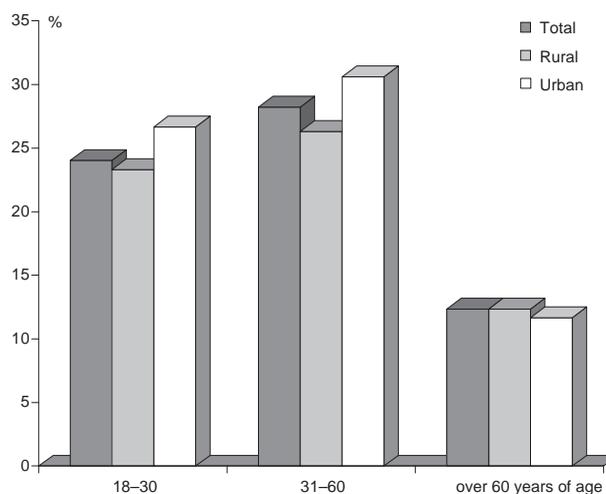
In the group examined, 23.0% of respondents were smokers, the percentage of males being twice as high as females (35.6% vs 15.1%) ( $p=0.0000$ ). A higher percentage of smokers was noted among urban than rural inhabitants (24.8% vs 21.6%). The percentage of male smokers in rural and urban areas was similar (35.5% vs 35.8%), whereas the percentage of female smokers was higher among urban than rural females (17.8 vs 13.0%).

The lowest percentage of smokers was noted among respondents aged over 60 (12.3%), while the highest – among those aged 31–60 (28.2%). The percentage of smokers among respondents aged 18–30 was 24.0% ( $p=0.0000$ ). The percentage of smokers aged over 60 was similar in rural and urban areas. The percentage of smokers aged 18–30 and 31–60 was higher among urban inhabitants. A detailed analysis by age showed that the lowest percentage of smokers was observed among respondents in the oldest age groups: 61–70 (17.7%), 71–80 (8.8%), over 80 (5.5%), and among respondents of the youngest age group 18–20 (8.1%). The highest percentage of smokers was noted among respondents aged 41–50 (31.9%) and 31–40 (27.9%).

Among urban, compared to rural inhabitants, the percentage of smokers was higher in the majority of age categories, apart from the youngest group – 18–20 (rural area – 9.8%, urban area – 6.1%) and those aged 71–80 (rural area – 9.6%, urban area – 7.6%). The percentage of smokers was considerably higher among urban inhabitants aged 41–50 (rural area – 29.0%, urban area – 35.8%) and 51–60 (rural area – 22.9%, urban area – 27.2%).



**Figure 1.** Prevalence of cigarette smoking habit with consideration of respondents' gender and place of residence.



**Figure 2.** Prevalence of cigarette smoking habit with consideration of respondents' age and place of residence.

While comparing the prevalence of the cigarette smoking habit among farmers and respondents performing non-agricultural occupations, it was noted that the percentage of smokers was lower among farmers than non-farmers (20.1 vs 23.3%). This difference was much clearer when making a comparison from the aspect of the occupation performed among rural inhabitants (farmers – 19.7%, non-farmers – 24.5% of smokers).

The highest percentage of smokers was observed among respondents who were occupationally active, compared to those non-active (28.0 vs 18.9%).

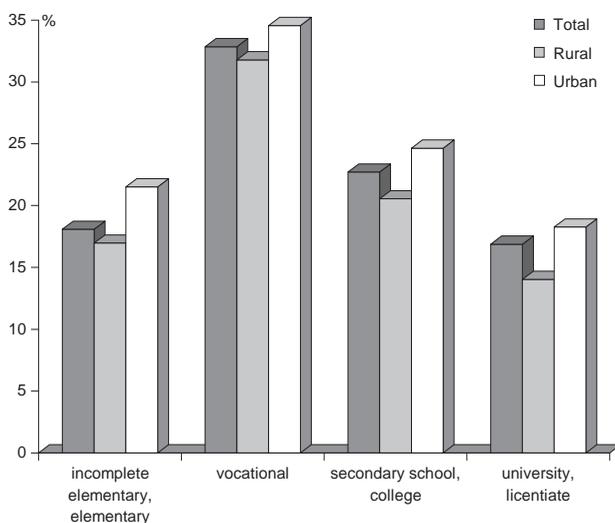
A significant relationship was observed between the respondents' level of education and prevalence of the cigarette smoking habit, both among rural and urban inhabitants ( $p=0.0000$ ). The lowest percentage of smokers was noted among those with the highest education level (16.9%), and those with the lowest level of education (18.1%). The highest percentage of smokers was found among respondents

with vocational education (32.8%). In all categories of education, the percentage of smokers was higher among urban than rural inhabitants.

## DISCUSSION

Since the 70s of the twentieth century, the percentage of smokers among the Polish population has been the highest in the world. At the beginning of the 80s, in some social and age groups, this percentage reached even 70–80% among males and 40–50% among females [23, 29]. As a result of health-promoting campaigns which have been organized since the beginning of the 90s, as well as adopted legislative solutions, State programmes, training courses for family physicians with respect to managing smokers, and a constant increase in the prices of tobacco products, significant changes took place in attitudes towards tobacco smoking [15, 17, 18, 20]. According to the Multicentre All-Polish Studies of Population Health (in Polish WOBASZ) in 2005, in Poland, 42.0% of males and 25.0% of females were smokers; in the Lublin Region – 42.0% of males and 23.0% of females [24]. Other sources for the years 2006–2007 estimated that the habit concerned 28.2–29.0% of the adult Polish population [29]. Previous studies performed in the Lublin region also indicated a higher percentage of smokers. In the study conducted in 2006, the percentage of male smokers was 45.5%; however, the selection of the sample was not of a random character [36]. Other studies carried out in the Regions of Łódź and Lublin indicated that 40% of males and 28% of females were smokers; however, the respondents were only those occupationally active, and, as confirmed also by the presented study, the percentage of smokers in this group was higher [13].

Own studies showed that the percentage of smokers (23.0%) was lower than that reported in earlier studies, and was similar to that in American society (23.5%), lower than in Italy (29.0%), but higher than in Sweden (18.0%)



**Figure 3.** Prevalence of cigarette smoking habit with consideration of respondents' education level and place of residence.

[5, 10]. The results obtained, on the one hand, confirm positive trends which have been observed in Poland since the beginning of the 90s, but on the other hand, may indicate the significant role of the economic factor because the Lublin Region belongs to the poorest regions in Poland and in the whole European Union. The percentage of smoking males was about twice as high as that of females, which is in accordance with the results of other Polish studies, and the observations by Finnish and French researchers [3, 10]. The trend noted in the United Kingdom and United States, where the percentage of smoking females is close to that of males, was not observed in our study [28].

A higher percentage of smokers among urban than rural inhabitants is consistent with observations made in the Kraków Region, and with reports from Germany, Russia, Ukraine, and Italy, which indicate that the prevalence of nicotine is greater among the urban population [6, 8, 21, 32]. However, this differs from the situation in some other countries, e.g. Canada, where the percentage of smokers is higher among the rural population [14]. The results of single studies from Poland also indicate a higher prevalence of nicotine among the rural population [16].

The epidemiological situation concerning tobacco smoking in the Lublin Region is different than that pertaining to other risk factors of cardiovascular diseases, such as obesity and abdominal obesity. Both obesity and abdominal obesity are significantly more often observed among the rural population (25.9% *vs* 19.9% and 54.0% *vs* 48.4%, respectively) which, despite a lower prevalence of nicotine, may significantly affect the epidemiological situation concerning cardiovascular system diseases [22].

No statistically significant differences were noted between the percentage of male smokers in rural than urban areas, while the percentage of urban female smokers was higher than that of rural female smokers. An analysis of the prevalence of nicotine among females carried out in the Baltic countries also showed that in all these countries (except Estonia), the habit is more prevalent among urban than rural females [11]. In the 70s of the twentieth century in Poland, the percentage of female smokers in the cities was nearly twice as high as that of rural female smokers, which resulted primarily from a low prevalence of the habit among rural female farmers [29]. The data obtained in the presented study indicate a decreasing tendency in the difference between the percentage of female smokers in urban and rural areas.

The highest percentage of smokers observed among respondent aged 31–60, both in urban and rural areas, was consistent with the results of other studies. The above-quoted Polish studies show a slightly higher percentage, compared to that obtained in own studies, of smokers aged 40–59, while the percentage of smokers aged over 59 was similar to that observed among people over 60 [16]. Earlier Polish studies confirmed that the highest percentage of smokers among the Polish population concerned people aged 31–44 [37]. The lowest percentage of smokers was noticed among the youngest respondents (18–20), which

may result from economic reasons and/or the effectiveness of prophylactic actions targeted towards this age group. The low prevalence of the habit in the oldest age group may be explained by both economic reasons and their usually poorer health situation. In the majority of age categories, a higher percentage of smokers was observed among urban than rural inhabitants. An especially great difference was noted between respondents aged 41–50.

The division of the total number respondents into farmers and non-farmers showed a lower percentage of smokers in the first group. Also in the group of rural inhabitants a higher percentage of smokers was observed among those performing non-agricultural occupations. The lowest prevalence of cigarette smoking noted among farmers probably results from a higher mean age in this occupational group; however, it may also be the effect of poorer health and economic situations.

Occupationally active respondents were smokers more often than those non-active, among both rural and urban inhabitants. Although the percentage of smokers among occupationally active rural and urban inhabitants was similar, it is noteworthy that that percentage was higher among non-active occupationally urban inhabitants. It seems that, apart from co-existing health problems, the economic reasons played a dominant role because those who were non-active occupationally, especially in rural areas, are the worst off – a large part of the group of those non-active occupationally are people at retirement age, and those with decisions made concerning invalidity group of degree of disability.

Many researchers indicate the relationship between respondents' education level and the occurrence of the cigarette smoking habit [12, 13, 16, 17]. They draw attention to the fact that patients with a lower education level more often become addicted. The results obtained confirm the relationship between the level of education and prevalence of the cigarette smoking habit. The lowest percentage of smokers was noted among those with university/licentiate education. The low prevalence of the cigarette smoking habit observed among patients with the lowest education level could be explained primarily by a considerably higher mean age in this group, and also associated with their poorer health situation and lower material standard. The percentage of smokers among people with higher education level was lower than that reported in earlier studies, which indicates the maintenance of a positive trend observed in this group in the 90s of the twentieth century. According to the results of other studies, the group which is most exposed to the hazardous effect of tobacco smoking remain those with vocational education [29].

The Lublin Region is among those where the average life span is the shortest in Poland, with the smallest increase in average life span observed during the period 1991–2004 [20]. It seems that a further decrease in the prevalence of the cigarette smoking habit may result in a significant improvement of the health situation in this area.

## CONCLUSIONS

1. The data obtained indicate that the prevalence of the cigarette smoking habit among the population of the Lublin Region is lower than that reported in former studies.

2. The percentage of smokers among urban inhabitants was higher than the rural population. This resulted mainly from a higher percentage of female smokers in urban than rural areas; while the percentages of urban and rural male smokers were similar. Although the percentage of female smokers was higher in urban than rural areas, this difference was clearly smaller than that observed several or several dozen years ago.

3. The highest percentage of smokers was noted among those aged 41–50, while this percentage was the lowest among the youngest and the oldest respondents.

4. The percentage of smoking farmers was lower than those who performed non-agricultural occupations, which was also observed among rural inhabitants.

5. People who were occupationally active were smokers more often than those who were non-active.

6. The lowest percentage of smokers was noted among respondents who possessed the highest education level, whereas the highest percentage was among those with vocational education.

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