REDUCTION IN THE PREVALENCE OF TOBACCO USE ACCOMPANYING LEGISLATIVE CHANGES IN TOBACCO POLICY IN POLAND IN THE YEARS 2010–2019

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Abstract

Objectives: Tobacco use is one of the most serious public health problems. Each year, it contributes to preventable disability and death of 8 million people worldwide. The aim of the study was to determine the change in the prevalence of tobacco and e-cigarettes use among Polish adults in the years 2010–2019 and the potential impact of legislative interventions on tobacco consumption in Poland. Material and Methods: The research was based on an analysis of secondary data obtained from a cross-sectional study as part of the public opinion monitoring in Poland. The study was carried out in 2 editions (2010 and 2019) on representative samples of approximately 1000 Polish residents >18 years of age. Results: The proportion of traditional cigarette smokers decreased from 30.4% to 26.0% in the years 2010–2019 (p < 0.05). In the male group decreased from 40.3% to 31.0% (p < 0.001); among females, the values remained at the same level (21.3%). The greatest change in the percentage of current smokers was recorded in cities with ≥500 000 inhabitants (from 30.3% to 17.1%) and <100 000 inhabitants (from 31.5% to 24.6%) (p < 0.05). The total support for the new legal regulations increased from 73.9% to 89.8% (p < 0.001). The use of e-cigarettes in 2019 declared only 1.9%. Conclusions: The percentage of adult traditional cigarette smokers decreased significantly between 2010 and 2019 (mainly among men). Among women, the percentage of cigarette smokers remained the same. The most significant declines in cigarette smoking were also observed among residents of the largest cities (≥500 000 inhabitants). During the same period, there was a further increase in the acceptance of legal restrictions on smoking cigarettes in public places. E-cigarette use among adults is a niche phenomenon in Poland, but it is much more prevalent among women than men. Int J Occup Med Environ Health. 2022;35(4):393–405

Key words: smoking cessation, Poland, tobacco, smoking, prevalence, smoke-free policy

INTRODUCTION

Tobacco use is one of the most serious public health problems. Each year, it contributes to preventable disability and death of 8 million people worldwide [1]. Data collected in the European Union (EU) shows that almost 0.7 million deaths per year are related to tobacco use [2]. Smoking contributes to over 71 600 avoidable deaths every year in Poland [3,4]. Research conducted by the European Commission in August–September 2020 shows that less than a quarter (23%) of EU respondents aged ≥15 years were current smokers of cigarettes, cigars, cigarillos or pipes [5]. A decrease in the percentage of smokers from 32% to 23% was observed in the EU countries and the United Kingdom in the years 2006–2020. One-fifth of the respondents declared themselves as ex-smokers (22%), while 55% have never smoked [5]. Significant differences in tobacco consumption have been observed between individual EU countries, with constantly rising levels of smoking prevalence in Southern Europe. More than a third of respon-
In 2016, the use of electronic cigarettes and novel tobacco products in public places was additionally prohibited [13].

**Aim of the study**
The aim of the study was to determine the change in the prevalence of tobacco and e-cigarettes use among Polish adults in the years 2010–2019 and the potential impact of legislative interventions (Tobacco Control Act [11]) on tobacco consumption in Poland.

**MATERIAL AND METHODS**
Data was collected from a questionnaire-based survey. The research was based on an analysis of secondary data obtained from a cross-sectional study carried out by the Public Opinion Research Center (Centrum Badania Opinii Społecznej – CBOS) as part of the public opinion monitoring in Poland. This method is widely available and allows to reduce the time and resources necessary to carry out the study [14,15].

The complete database used in the analyses was obtained from CBOS. The database was prepared and used only for the purpose of this research. Public Opinion Research Center is a foundation that receives grants for maintenance and realization of tasks indicated in the state budget. One of its assignments includes conducting representative surveys. The mission of CBOS is to systematically provide opinions on economic and socio-political (including health) issues for public use.

The surveys are conducted on representative samples of approx. 1000 Polish residents >18 years of age. Randomization of study sample is ensured on several stages. In the beginning, a sampling frame is selected. An individual PESEL number is used in the CBOS survey. Next, the study population is divided into subgroups from which respondents are selected. The population is divided into 6 groups (strata) based on the place of residence. The authors then decide on the number of respondents to be chosen from each stratum to maintain represen-
RESULTS

General results

In Poland, the proportion of traditional cigarette smokers decreased from 30.4% to 26.0% in the period February 2010–July 2019 (p < 0.05). At the same time, no significant differences were observed in the percentage of participants who declared smoking in the past.

Although in 2010 44.4% of respondents did not mind being around smokers, this number dropped to 41.7% in 2019 (p < 0.05). The ban on smoking traditional cigarettes in public places was originally supported by 73.9% of the respondents (44.6% expressed strong support and 29.3% declared they somewhat support the ban), and by 89.8% in 2019 (74.8% and 15.0%, respectively) (p < 0.001).

Prevalence of current smoking in socio-economic groups

In the years 2010–2019 the proportion of current traditional cigarette smokers in the male group decreased from 40.3% to 31.0% (p < 0.001) (Figure 1). No such trend was observed among women, for whom the percentages remained at the same level of 21.3% in 2019. As for the place of residence, the greatest change in the percentage of current smokers between the years 2010–2019 was recorded in cities with ≥500,000 inhabitants (a decrease of 13.2 percentage points: from 30.3% to 17.1%) or with <100,000 inhabitants (a decrease by 6.9 percentage points: from 31.5% to 24.6%) (p < 0.05). In the 2010 study, the highest percentage of smokers was found among respondents with basic vocational education – 40.4%, while in the 2019 study in those with primary/secondary education – 40.4%, and in those with higher education – 23.6% (2010) and 16.2% (2019). Differences between education level groups were statistically non-significant.

Smoking traditional cigarettes in the past

The proportion of ex-smokers among male respondents increased from 27.6% to 32.0% (p < 0.01) between the
Figure 1. Declared traditional cigarettes smoking and smoking of traditional cigarettes in the past in 2010 and 2019 based on the survey conducted on a representative sample (N = 1021 adults in February 2010 and N = 1077 in July 2019), Poland

* Statistically significant changes with respect to smoking currently.
** Statistically significant changes with respect to smoking in the past.
years 2010–2019, while changes in the numbers of female ex-smokers turned out to be statistically non-significant. However, when it comes to age groups, a significant change was observed in the group of 35–49-year-olds – the percentage of former smokers decreased from 27.7% to 19.9% (p < 0.05). A significant change was also recorded among respondents aged ≥65 years – the percentage of ex-smokers increased from 20.6% to 36.3% (p < 0.001) (Figure 1).

Analysis focused on the place of residence showed that the percentage of former tobacco users increased over the years in rural areas and in cities of 100 000–499 999 inhabitants, although this change was not statistically significant. In cities with <100 000 inhabitants, the proportion of former smokers increased from 23.3% to 30.4% (p < 0.05), while in cities with ≥500 000 inhabitants the proportion decreased from 26.8% to 18.4% (p < 0.01).

The proportion of those who declared smoking in the past within the group of respondents with primary/secondary vocational education increased by 6.4 percentage points, from 15.9% to 22.3% (p < 0.05). This phenomenon primarily concerned people >50 years of age. In the 50–64 years age group, an increase from 48.6% to 54.5% was observed and even bigger change was reported in the ≥65 years age group, where the numbers increased from 14.3% to 33.9%.

In the remaining groups classified by education level, the changes were found to be statistically non-significant. Changes in housing and living conditions of former tobacco users were also discovered to be statistically non-significant.

Change in the attitude of Poles towards the ban on smoking traditional cigarettes in public places

In the period of 2010–2019, the total support for the new legal regulations increased from 73.9% to 89.8% (with “strong support” expressed by 74.8% of respondents and therefore gaining 30.2 percentage points) (p < 0.001). A total number of 68.3% of men surveyed in the study supported the introduction of the ban, while in 2019 the number of male supporters reached 86.9% (p < 0.001). An increase from 79.0% to 92.6%, i.e., by 13.6 percentage points was also observed among female respondents (p < 0.001) (Figure 2).

In 2010, the ban on smoking traditional cigarettes in public places received the strongest support from respondents aged ≥65 years – 82.1%. In 2019, the percentage of supporters from this age groups increased to 91.0%, similarly to the numbers recorded in the 35–49 years age group. In both editions of the study, the weakest support was expressed by people aged 50–64 years (Figure 2).

The change in attitude towards the ban on smoking in public places proved to be statistically significant in all age groups: ≤34 years (p < 0.001), 35–49 years (p < 0.001), 50–64 years (p < 0.001), ≥65 years (p < 0.01).

In terms of the place of residence, the analysis of changes in the attitude towards the smoking ban in public places showed that the largest increase in support for the ban was recorded in cities with 100 000–499 999 inhabitants – from 65.9% to 92.4%, i.e., by 26.5 percentage points. The smallest increase in the approval for restrictions was observed in rural areas – from 80.0% (the group with the highest support) to 91.6% (p < 0.001) (Figure 2).

Using electronic cigarettes

In 2019, the regular use of e-cigarettes was declared by 1.9% of adult Polish residents, while 1.4% declared oc-
**Figure 2.** Support for the ban on smoking in public places based on: gender, age, place of residence, education and material conditions of the household based on the survey conducted on a representative sample (N = 1021 adults in February 2010 and N = 1077 in July 2019), Poland

* The categories in which the change was statistically significant were marked.
tially contributed to the decrease in the proportion of traditional cigarette smokers aged ≥18 from 30.4% in 2010 to 26.0% in 2019, as shown in the analysis. Although progress has been made in implementing smoke-free policies, 1 in 4 Poles still use tobacco, which may indicate targets for further legislative changes in tobacco control policy.

Similar advancements have been observed in other European countries that have previously changed their smoke-free policies. In 2004, Ireland was the first EU country to introduce a total smoking ban in all workplaces, including restaurants and pubs [16]. In 2003, the smoking prevalence in Ireland was 25.3% and it dropped to 21.5% in 2013, i.e., by 3.8 percentage points during 9 years when the new law was applying. Moreover, Ireland is observing further decline in smoking prevalence, with 17.0% of respondents declaring themselves as active smokers in 2019 [17].

In 2004, Norway also introduced a ban on smoking indoors: in restaurants, bars, and hotels. Data for Norway show a decrease of 11 percentage points, from 27% in 2003 to 15% in 2013. National statistics show that in 2020, the proportion of daily smokers was 9% [18].

In Italy, smoke-free policies have been in force since 2005. In this country, the percentage of smokers in 2004 was 26.2% [19] and also decreased – to 21.4% in 2015/2016 [20].

This analysis focuses on the changes in smoking prevalence which occurred after the implementation of new restrictions within the scope of anti-smoking policy in Poland. The enacted law was aimed at protecting the health of non-smokers in public spaces. From November 15, 2010, the smoking ban began to apply in healthcare facilities, cultural and leisure facilities, means of public transport and public transport stops, as well as in recreational areas for children and catering establishments (pubs and restaurants). The above-mentioned changes may have potentially contributed to the decrease in the proportion of traditional cigarette smokers aged ≥18 from 30.4% in 2010 to 26.0% in 2019, as shown in the analysis. Although progress has been made in implementing smoke-free policies, 1 in 4 Poles still use tobacco, which may indicate targets for further legislative changes in tobacco control policy.

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In view of the situation in other EU countries, it is necessary to maintain the current direction of changes in attitudes towards smoking among different social groups, as well as to monitor the changes that are already taking place.

Moreover, other social and economic factors, such as the place of residence or education level, are observed to influence smoking prevalence [21,22]. In the analysis, the most significant declines in smoking rates were recorded in cities with more than 500,000 inhabitants (decrease by 13.2 percentage points). In 2019, 17.1% of inhabitants of these cities used traditional tobacco when compared to 22.5% of people living in rural areas. However, this difference appeared to be statistically non-significant. The re-
Table 1. Declared use of an electronic cigarette in 2019 based on the survey conducted on a representative sample of 1077 adults, July 2019, Poland

| Variable                      | Participants (N = 1077) [%] | p    |
|-------------------------------|-----------------------------|------|
|                               | electronic cigarette        |      |
|                               | regular use (1.9%)          |      |
|                               | occasional use (1.4%)       |      |
| Gender                        |                             |      |
| male                          | 2.9                         | 2.0  | <0.05 |
| female                        | 0.9                         | 0.9  |      |
| Age                           |                             | <0.001|
| ≤34 years                     | 3.0                         | 3.7  |      |
| 35–49 years                   | 3.0                         | 0.8  |      |
| 50–64 years                   | 0.7                         | 0.4  |      |
| ≥65 years                     | 0.4                         | 0.4  |      |
| Place of residence            |                             | 0.169|
| rural areas                   | 0.9                         | 1.4  |      |
| city                          |                             |      |
| <100 000 inhabitants          | 2.0                         | 1.0  |      |
| 100 000–499 999 inhabitants   | 3.5                         | 1.2  |      |
| ≥500 000 inhabitants          | 1.3                         | 3.9  |      |
| Education                     |                             | 0.180|
| elementary/lower secondary    | 2.1                         | 3.2  |      |
| basic vocational              | 1.9                         | 0.4  |      |
| medium                        | 2.4                         | 1.2  |      |
| higher                        | 1.0                         | 1.0  |      |
| Health condition              |                             | 0.065|
| very good                     | 0.0                         | 3.0  |      |
| quite good                    | 2.3                         | 1.5  |      |
| neither good nor bad          | 1.6                         | 0.0  |      |
| quite poor                    | 2.2                         | 2.2  |      |
| very bad                      | 0.0                         | 0.0  |      |
| hard to say                   | 0.0                         | 0.0  |      |
| Material conditions           |                             | 0.515|
| bad or rather bad             | 3.4                         | 5.2  |      |
| neither good nor bad          | 1.1                         | 0.5  |      |
| rather good                   | 2.6                         | 1.6  |      |
| good                          | 1.4                         | 1.4  |      |
results obtained in the first edition of the study correspond with the results from the 2010 GATS study, which reported that 30.4% of respondents in large cities and 26.1% in rural areas smoked traditional cigarettes every day or occasionally [8]. In a study conducted in 2019, researchers from Kantar reported that 17.1% of tobacco users lived in large cities and 17.3% in rural areas [10]. Differences in the prevalence of smoking between large cities and rural areas may result from greater dissemination of information on anti-smoking policies in large cities [23].

With regard to the level of education, the authors proved that participants with lower education (primary/secondary or basic vocational) smoke tobacco more often than people with secondary and higher education, which is consistent with the results presented in similar reports. Data collected in 2010 from GATS research showed that 29.6% of people with primary education and 43.9% with vocational education used tobacco every day [24]. In the 2019 Kantar report the numbers were 22.1% and 29.7%, respectively [10]. Possible explanation for greater prevalence of smoking addiction among people with lower education may be associated with lower awareness of health risks posed by smoking. It is also important to mention educational campaigns targeting particular population groups which were carried out throughout the study period studied, as such initiatives may have also contributed to a decline in the prevalence of tobacco use.

In Poland the Chief Sanitary Inspectorate is one of the organs responsible for the implementation and coordination of educational activities in the field of behaviours and attitudes related to smoking. At the time of the smoking ban adoption, a nationwide media campaign was launched in 2010 (TV broadcast), informing about changes in the national tobacco policy, specifically including the ban on smoking in workplaces and public areas [12]. Other initiatives undertaken by the Chief Sanitary Inspectorate include annual organization of a nationwide educational campaign “World No Tobacco Day” established by the World Health Organization on May 31. This campaign is addressed to general public [25]. Activities organized on this day aim to encourage the widest possible group of recipients to quit smoking [26]. Educational attractions are carried out in cooperation with local media and their costs are covered by municipal funds for tobacco prevention activities, therefore allowing the organizers to reach a wider audience. Numerous articles, interviews, broadcasts and TV spots reinforce the impact of health-promoting initiatives and activities [27]. The talks,
These data suggests that cigarette price increase may be one of the elements potentially influencing the decline in smoking prevalence in Polish population. With this in mind, it is important to emphasise that comprehensive tobacco control policies should also address economic issues. Furthermore, a significant increase in support for the introduced ban on smoking in public places was observed in the study period, rising from 73.9% in 2010 to 89.8% in 2019 (the frequency of expressing “strong support” by respondents increased by 30.2 percentage points to 74.8%). The results of studies carried out in other EU countries which implemented anti-smoking policies earlier than Poland showed that support often increases after the introduction of smoke-free environments. In Italy, the support for anti-smoking policy has gradually increased from 83% before the 2001 ban to 93% in 2006 after the introduction of smoking ban. A similar situation was observed in Ireland, where support for a total smoking ban among Irish smokers increased in the years 2003–2005: in workplaces (43% to 67%), in restaurants (45% to 77%) and in bars/pubs (13% to 46%). A total number of 83% of Irish smokers described the anti-smoking legislation as “good” or “very good” [33].

In France, Germany and the Netherlands, a comprehensive anti-smoking policy has been shown to receive more support than partial smoking bans. More than three-quarters of Germans (77.5%) supported a ban on smoking in restaurants and bars. In the Czech Republic, support for the prohibition on smoking in restaurants increased from 65.4% in 2010 to 68.4% in 2011, while in Finland the numbers rose from 34% in 2004 to 61% in 2005. Research conducted in Norway also proved that public support for anti-smoking laws increased significantly following the introduction of laws banning smoking in bars and restaurants – from 54% in 2004 to 90% in 2011 [33]. In Poland, the Chief Sanitary Inspectorate is responsible for enforcing the anti-tobacco policy. In 2018, 99.6% (N = 260 957) of the inspected facilities complied with the requirements of the anti-smoking law [26].
The protection from exposure to secondhand smoke ensured by the law has been welcomed by both smokers and non-smokers. However, the support for the ban in different types of public places where smoking was banned is unknown. It is possible that smoking is more acceptable in places where researchers, e.g. Jankowski et al. [12] have noted greater exposure to SHS, such as catering and hospitality establishments, as well as public transport stops. With this in mind, the laws need to be improved in terms of the enforced restrictions and designation of places where smoking is still allowed.

In the group of respondents analysed in 2019, the use of e-cigarettes was a rare phenomenon. The results of the analysis are in line with data generally recorded in the EU countries. In 2014, 1.5% of the adult population were regular e-cigarette users, while in 2017 this group amounted to 1.8%. Men declared the use of e-cigarettes more often than women and the same trend was relevant to younger respondents [34]. The Special Eurobarometer 506 report also indicated that approx. 1% of the Polish population were e-cigarette users in 2020 [5]. Research also shows that e-cigarettes have been gaining more popularity among young people, i.e., between 15–19 years of age. The prevalence of e-cigarette use increased by 9 percentage points, from 2% in 2010–2011 to 11% in 2015–2016. Researchers have noticed that e-cigarettes do not replace traditional cigarettes but rather allow for the use of various products [35].

Tobacco control legislation is an important element in combating health and socio-economic consequences of smoking. It is important to remember, however, that the decline in smoking prevalence is also the result of many variables, such as increased public awareness, information and education campaigns and economic impact through increased cigarette prices.

Limitations of the research method
The analysed data comes from a survey conducted on a representative sample of Poles. This type of research increases the quality and credibility of the collected data. However, in both cases the nature of the research is based solely on questionnaires and the collected data is of a declarative nature. It means that the analyses were made only on the basis of respondents’ answers and not on the basis of observed behaviours. There is a risk that, in some cases, there may have been discrepancies between the respondents’ answers and facts.

There are still many factors that influence the prevalence of smoking in a given society. The problem of smoking remains a very broad subject and it is impossible to analyse all factors in one publication.

CONCLUSIONS
The percentage of adult traditional cigarette smokers decreased significantly between 2010 and 2019, but the change was observed mainly among men. Among women, the percentage of cigarette smokers remained the same. The most significant declines in cigarette smoking were also observed among residents of the largest cities (≥500,000 inhabitants).

During the same period, there was a further increase in the acceptance of legal restrictions on smoking cigarettes in public places.

E-cigarette use among adults is a niche phenomenon in Poland, but it is much more prevalent among women than men.

REFERENCES
1. World Health Organization [Internet]. Geneva: Tobacco; 2019 [cited 2021 Mar 18]. Available from: https://www.who.int/news-room/fact-sheets/detail/tobacco.
2. European Commission [Internet]. European Union: Special Eurobarometer 458 – Attitudes of Europeans towards Tobacco and Electronic Cigarettes; 2017 [cited 2021 Mar 19]. Available from: https://op.europa.eu/en/publication-detail/-/publication/2f01a3d1-0af2-11e8-966a-01aa75ed71a1/language-en.
3. World Health Organization (WHO). The current status of the tobacco epidemic in Poland. Copenhagen: WHO; 2009.
4. The Tobacco Atlas [Internet]. American Cancer Society [cited 2021 Mar 19]. Available from: https://files.tobaccoatlas.org/wp-content/uploads/pdf/poland-country-facts-en.pdf.
5. European Commission [Internet]. European Union: Special Eurobarometer 506 – Attitudes of Europeans towards tobacco and electronic cigarettes; 2021 [cited 2021 Mar 19]. Available from: https://op.europa.eu/en/publication-detail/-/publication/c070c04c-6788-11eb-aeb5-01a756ed71a1/language-en/format-PDF/source-192428838.
6. Kaleta D, Makowiec-Dąbrowska T, Dziakowska-Zabroszczyk E, Fronczak A. Determinants of heavy smoking: results from the Global Adult Tobacco Survey In Poland (2009–2010). Int J Occup Environ Health. 2012;25(1):66–79, https://doi.org/10.2478/s13382-012-0009-7.
7. Włodarczyk A, Raciborski F, Opoczyńska D, Samoliński B, GATS PWG. Daily tobacco smoking patterns in rural and urban areas of Poland – the results of the GATS study. Ann Agric Environ Med. 2013;20(3):588–94.
8. Ministry of Health. Globalny Sondaż dotyczący Używania Tytoniu przez Osoby Dorosłe (GATS). Polska 2009–2010. Warsaw: The Ministry, 2010. Polish.
9. Trząsalska A, Krassowska U. Kantor Public dla Głównego Inspektoratu Sanitarnego. Raport z ogólnopolskiego badania ankietowego na temat postaw wobec palenia tytoniu [Internet]. 2019 [cited 2021 Apr 28]. Available from: https://gis.gov.pl/wp-content/uploads/2018/04/Postawy-Polak%C3%B3w-do-palenia-tytoniu_Raport-Kantar-Public-dla-GIS_2019.pdf. Polish.
10. Pinkas J, Kaleta D, Zgliczyński WS, Lusawa A, Wrześniewska-Wal I, Wierzbowa W, et al. The Prevalence of Tobacco and E-Cigarette Use in Poland: A 2019 Nationwide Cross-Sectional Survey. Int J Environ Res Public Health. 2019;16(23):4820, https://doi.org/10.3390/ijerph16234820.
11. [The Act of 9 November 1995 on Health Protection against the Consequences of Tobacco and Tobacco Products]. J Laws 1996, No. 10, item 55, as amended. Polish.
12. Jankowski M, Rees V, Zgliczyński WS, Kaleta D, Gujski M, Pinkas J. Self-reported secondhand smoke exposure following the adoption of a national smoke-free policy in Poland: analysis of serial, cross-sectional, representative surveys, 2009–2019. BMJ Open. 2020;24;10(9):e039918, https://doi.org/10.1136/bmjopen-2020-039918.
13. [The Act of 22 July 2016 on amending the Act on health protection against the consequences of tobacco and tobacco products]. J Laws 2016, item 1331. Polish.
14. Smith AK, Ayanian JZ, Covinsky KE, Landon BE, McCarthy EP, Wee CC, et al. Conducting High-Value Secondary Dataset Analysis: An Introductory Guide and Resources. J Gen Intern Med. 2011;26(8):920–9, https://doi.org/10.1007/s11606-010-1621-5.
15. Cheng HG, Phillips MR. Secondary analysis of existing data: opportunities and implementation. Shanghai Arch Psychiatry. 2014;26(6):371–5, https://doi.org/10.11919/j.issn.1002-0829.214171.
16. Gorini G, Costantini AS, Paci E. Smoking prevalence in Italy after the smoking ban: Towards a comprehensive evaluation of tobacco control programs in Europe. Commentary. Prev Med. 2007;45(2-3):123–4, https://doi.org/10.1016/j.ypmed.2007.06.019.
17. UCD Geary Institute for Public Policy [Internet]. Malone P, O’Connell P. Trends in Smoking Prevalence and Tobacco Consumption. [cited 2021 Mar 12]. Available from: https://publicpolicy.ie/downloads/papers/2020/Trends_in_Smoking_Prevalence_and_Tobacco_Consumption.pdf.
18. Statistics Norway [Internet]. Oslo: Statistisk sentralbyrå, 2021 [cited 2021 March 12]. Tobacco, alcohol and other drugs. Available from: https://www.ssb.no/en/royk.
19. Gallus S, Zuccaro P, Colombo P, Apolone G, Pacifici R, Garattini S, Bosetti C, La Vecchia C. Smoking in Italy 2005–2006: effects of a comprehensive National Tobacco Regulation. Prev Med. 2007;45(2-3):198–201, https://doi.org/10.1016/j.ypmed.2007.03.009.
20. Lugo A, Zuccaro P, Pacifici R, Gorini G, Colombo P, La Vecchia C, Gallus S. Smoking in Italy in 2015-2016: prevalence, trends, roll-your-own cigarettes, and attitudes towards...
incoming regulations. Tumor. 2017;103(4):353–9, https://doi.org/10.5301/tj.5000644.

21. Palipudi KM, Gupta PC, Sinha DN, Andes LJ, Asma S, McAfee T, et al. Social Determinants of Health and Tobacco Use In Thirteen Low and Middle Income Countries: Evidence from Global Adult Tobacco Survey. PloS One. 2012;7(3):e33466.

22. Huisman M, Kunst AE, Mackenbach PE. Inequalities in the prevalence of smoking in the European Union: comparing education and income. Prev Med. 2005;40(6):756–64, https://doi.org/10.1016/j.ypmed.2004.09.022.

23. Buettner-Schmidt K, Miller DR, Maack B. Disparities in Rural Tobacco Use, Smoke-Free Policies, and Tobacco Taxes. West J Nurs Res. 2019;41(8):1184–202, https://doi.org/10.1177/0193945918828061.

24. Kaleta D, Makowiec-Dąbrowska T, Dziankowska-Zaborszczyk E, Fronczak A. Prevalence and socio-demographic correlates of daily cigarette smoking in Poland: results from the Global Adult Tobacco Survey (2009–2010). Int J Occup Med Environ Health. 2012;25(2):126–36, https://doi.org/10.2478/S13382-012-0016-8.

25. Minister of Health. The programme on reducing health consequences of tobacco smoking in Poland. Aims and Objectives for the years 2014–2018 [Internet]. Warsaw: Council of Ministers; 2013 [cited 2021 Aug 1]. Available from: https://www.gov.pl/attachment/29b8cd5f-5c85-4cc5-acc7-2c3a4e1d0a14. Polish.

26. Chief Sanitary Inspectorate. [Sanitation: a country situation in 2018] [Internet]. Warsaw: Chief Sanitary Inspectorate; 2019 [cited 2021 Aug 1]. Available from: https://gis.gov.pl/wp-content/uploads/2019/09/SSK-2018-www-1.pdf. Polish.

27. Chief Sanitary Inspectorate. Report on the implementation of the Tobacco Control Programme in Poland in 2014 [Internet]. Warsaw: Council of Ministers; 2015 [cited 2021 Aug 1]. Available from: http://orka.sejm.gov.pl/Druki8ka.nsf/0/BC809E7843EE1D78C1257F3B004C3909/%24File/191.pdf. Polish.

28. World Health Organization. WHO report on the global tobacco epidemic, 2019: Monitoring tobacco use and prevention policies [Internet]. Geneva: World Health Organization; 2017 [cited 2021 Apr 1]. Available from: https://apps.who.int/iris/bitstream/handle/10665/326043/9789241516204-eng.pdf?ua=1.

29. Zatoński W, Przewoźniak K, editors. [Development in practice. Curbing the Epidemic. Governments and the Economics of Tobacco Control]. Waszyngton D.C.: World Bank; 1999. Krakow: Wydawnictwo Medycyna Praktyczna; 2002. Polish.

30. Dessaix A, Maag A, McKenzie J, Currow DC. Factors influencing reductions in smoking among Australian adolescents. Public Health Research and Practice 2016;26(1):e2611605, https://doi.org/10.17061/phrp2611605.

31. Bader P, Boisclair D, Ferrence R. Effects of Tobacco Taxation and Pricing on Smoking Behavior in High Risk Populations: A Knowledge Synthesis. Int J Environ Res Public Health. 2011; 8(11): 4118–39.

32. Maly Rocznik Statystyczny Polski. Concise Statistical Yearbook of Poland. Warszawa: Statistics Poland; 2020.

33. European Commission [Internet]. Report on the implementation of the Council Recommendation of 30 November 2009 on Smoke-free Environments (2009/C 296/02). Brussels, 14.3.2013 SWD(2013) 56 final/2 [cited 2021 Apr 12]. Available from: https://ec.europa.eu/health/sites/health/files/tobacco/docs.smoke-free_implementation_report_en.pdf.

34. Laverty AA, Filippidis FT, Vardavas CI. Patterns, trends and determinants of e-cigarette use in 28 European Union Member States 2014–2017. Prev Med. 2018;116:13–8, https://doi.org/10.1016/j.ypmed.2018.08.028.

35. Smith DM, Gawron M, Balwicki L, Sobczak A, Matynia M, Goniewicz ML. Exclusive versus dual use of tobacco and electronic cigarettes among adolescents in Poland, 2010–2016. Addict Behav. 2019;90:341–8, https://doi.org/10.1016/j.addbeh.2018.11.035.