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IMPACTS OF TOBACCO USE AND EXPOSURE TO TOBACCO SMOKE ON HEALTH, SOCIETY, ECONOMY, AND ENVIRONMENT

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Abstract: Smoking represents a significant global public health challenge and is the primary preventable cause of disease and death. This problem is accentuated by the fact that a substantial 80% of adult smokers worldwide come from low- or middle-income countries. The aim of this paper is twofold: first, to highlight the health impacts associated with tobacco use, and second, to delineate the indirect damage caused to the environment during the life cycle of tobacco products - from production and distribution to consumption and waste generation. The reluctance of some countries to take decisive action, together with intense pressure from tobacco corporations, is hindering progress towards reducing the number of adult smokers and curbing tobacco use among minors. State interventions, supported by strict laws, are necessary to enforce the ban on indoor smoking, the ban on the sale of tobacco to minors, and the establishment of permanent interstate cooperation in the fight against cigarette smuggling. Educational initiatives aimed at raising awareness of the dangers of smoking and tobacco consumption are key to fostering a smoke-free culture. A strong media campaign, supported by state measures, could contribute to faster and more comprehensive targeting of target groups, especially younger age categories.

Keywords: tobacco smoke, passive smoking, nicotine, prevention, education
Field: Medical Sciences and Health

1. INTRODUCTION

Cigarettes are the most widely used tobacco product in most countries globally and stand as the primary preventable cause of death. Tobacco companies allocate substantial resources to advertise their products. Despite their denial of targeting young people through advertising, the reality differs: 90% of smokers initiate smoking before turning 18 (Center for Disease Control and Prevention, 2018).

There is virtually no region unaffected by secondhand smoke exposure. Annually, passive smoking contributes to 600,000 deaths, including 165,000 children. Scientific literature confirms that passive smoking in adults correlates with elevated rates of cardiovascular diseases, asthma, allergies, atopic and other dermatitis, dementia, and various cancers. Young individuals are especially vulnerable to passive smoking; children with smoking parents are exposed to nicotine levels equivalent to smoking between 60 and 150 cigarettes in a year (Rojanić Palavra et al., 2013).

In 2022, Brazil led global tobacco exports with 553 million kilograms of unprocessed tobacco, followed by India (260) and China (221) (Statista, 2023a). British American Tobacco topped the industry with sales of 34.06 billion US dollars in 2022, with Philip Morris International in second place at 31.80 billion dollars. Despite its iconic American cigarette brand, Philip Morris International refrains from selling cigarettes in the United States, operating its international segments as independent entities (Statista, 2023b).

Tobacco smoke from cigarettes contains over 7,000 different chemical compounds, with more than 250 being harmful to health, such as hydrogen cyanide, carbon monoxide, and ammonia, while over 70 are carcinogenic. Out of the 1.1 billion adult smokers globally, a staggering 80% hail from low- or middle-income countries. The prevalence of tobacco use worldwide is on the decline: in 2000, 27% of the population smoked tobacco, a figure reduced to 20% by 2016 (BBC, 2019).

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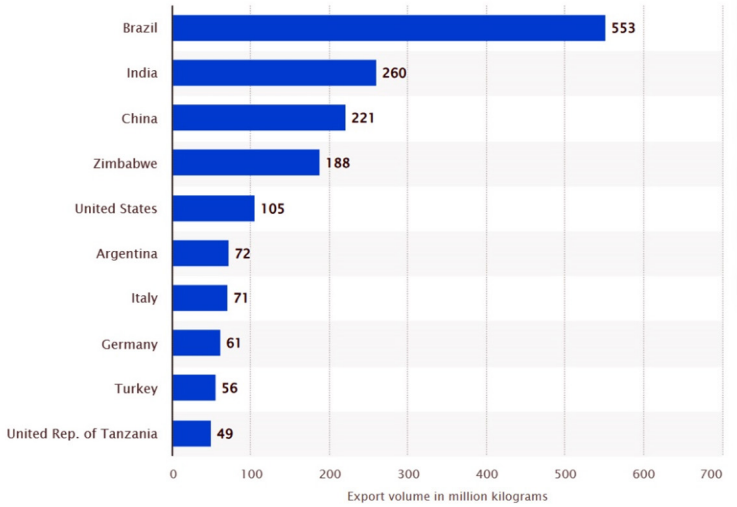
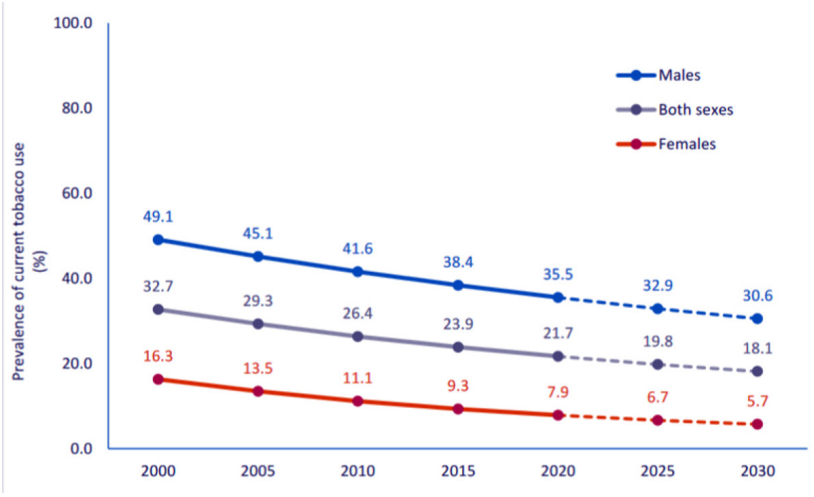
Figure 1. GlobalExport volume of unmanufactured tobacco worldwide in 2022, by leading country



Source: Statista, 2023

In 2000, 16.3% of women used some form of tobacco. Projections indicate a 6.7% decrease by 2025 and a continuing trend, reaching 5.7% by 2030. Data reveals that this reduction among women was achieved by 2021. Conversely, the number of men using tobacco in 2000 was three times higher than that of women, a gap expected to widen to slightly over five times by 2030 (WHO, 2024).

Figure 2. Global trends in prevalence of tobacco use among aged 15 years and older, by sex, 2000-2030
(estimates to 2020, projections to 2030)



Source: World Health Organization, 2024

The World Health Organization (WHO) adopted the Framework Convention on Tobacco Control in 2003 as the first evidence-based agreement negotiated under the auspices of the WHO. The framework aims to "protect present and future generations from the devastating health, social, environmental, and economic consequences of tobacco consumption and exposure to tobacco smoke by creating a framework for tobacco control measures that the parties will apply on a national, regional, and international level to impact the population's health" (Ministarstvo zdravlja RS, 2011).

In the Republic of Croatia, approximately 14,000 people die each year due to smoking, with about 95% of lung cancer deaths occurring in smokers. One-third of Croatians smoke, with half of them consuming an average of 15 to 24 cigarettes daily (Zavod za javno zdravlje Dubrovačko-neretvanske županije, 2023a).

Research on tobacco use prevalence in Montenegro's population reveals a high rate, with 35.4% of adults aged 15 to 64 actively smoking. Additionally, 17.1% have smoked in the past but quit, while 47.6% are nonsmokers. The highest prevalence of adult smokers is in the 45 to 54 age group, at 45% (Ljaljević

et al., 2019).

In Bosnia and Herzegovina, nearly one million out of 3.5 million people use tobacco products, with a smoking prevalence of 35.5% among those older than 15 years. Approximately 9,000 people die annually from smoking-related causes, including a thousand passive smokers (Katić, 2022).

Nearly half of North Macedonia's population smokes (48.4%), averaging 20 cigarettes per day. Men smoke more than women, with a ratio of 57.9% versus 39%, and smoking rates increase with age, peaking between 45 and 54 years. Comparatively, European countries exhibit lower smoking prevalence, such as Bulgaria and Greece at 27%, and Sweden at 8.7%. Data show that about 90% of roll-your-own tobacco smokers bought the product on the open market, without a label or health warning about the harm of tobacco. (DW, 2020).

2. SMOKING AS THE LEADING RISK FACTOR OF ILLNESS AND DEATH

Numerous studies have established the harmfulness of smoking and tobacco smoke, as well as the cause-and-effect relationship in morbidity and mortality from cardiovascular, cerebrovascular, malignant, and respiratory system diseases. Diseases affecting the oral cavity, larynx, trachea, bronchi, lungs, esophagus, stomach, spleen, bladder, breast, uterus, and harmful effects on fetal development are identified as typical smoking-related illnesses (Mayer, 2017).

Smoking significantly raises the risk of coronary heart disease and stroke by 2-4 times compared to non-smokers, increases the risk of lung cancer by 23 times for men and 13 times for women, raises the risk of death from chronic obstructive pulmonary disease by 12-13 times, and makes smokers aged 30 five times more likely to experience a heart attack by age 40 compared to non-smokers of the same age (Zavod za javno zdravlje Dubrovačko-neretvanske županije, 2023b).

Smoking is associated with a quarter of all malignant disease cases worldwide. Adequate implementation of scientifically proven tobacco control measures could prevent an estimated 1.6 million cases of lung cancer in Europe. In this regard, the European action plan against cancer aims for a 5% reduction in tobacco consumption by 2040, a substantial improvement from the current rate of 25% (Kilibarda et al., 2021).

The American Lung Association asserts that smoking is the root cause of the ten most common diseases, with lung cancer being the primary cause of death. Cigarette smoking stands as the leading risk factor for this disease in 90% of cases, with a 26.6% survival rate after five years. Chronic obstructive pulmonary disease (COPD) results in disability and death, ranking as the sixth leading cause of death in the US, with 85% to 90% of cases tied to smoking. Smoking also triggers asthma attacks, reduces blood flow to the heart, and heightens the risk of heart disease. A reduction in smoking corresponds to fewer heart problems and strokes, the fifth leading causes of death and disability in adults. Moreover, smoking complicates pregnancy and increases the risk of various diseases like type 2 diabetes, colon, cervix, liver, stomach, and pancreatic cancers, while lowering the survival rate of prostate cancer patients (American Lung Association, 2024).

Tobacco smoke comprises numerous chemical compounds in gas form and tiny suspended droplets. The mixture's composition depends on the conditions of creation and the smoker's behavior, resulting in two types of tobacco smoke: primary and secondary. Primary smoke exits the lit cigarette's end as the smoker inhales, with the tobacco burning at temperatures up to 950°C. In contrast, side smoke forms between puffs at lower temperatures (600 to 800°C) and emanates from the cigarette's smoldering tip. Side smoke contains more toxic compounds than primary smoke, such as twice the amount of nicotine, 15 times more formaldehyde, and 147 times more ammonia (WHO, 2017).

The benefits of quitting smoking are numerous: it reduces the risk of premature death regardless of the age at which a person quits, with the maximum advantage seen if quitting occurs before age 35. After quitting, cardiovascular mortality progressively decreases, and the progression of chronic obstructive lung diseases slows down. In pregnant women, quitting reduces the risk of low birth weight and premature birth. Additionally, quitting smoking improves the sense of taste and smell, freshens breath, improves circulation, eliminates coughing, regulates heartbeat, and overall enhances health (Šukalo, 2024).

In the professional community, opinions on heated tobacco products (HTP) are divided. HTP products heat rather than burn tobacco, reducing harmful substances. Proponents of HTP emphasize their potential to reduce smoking prevalence and exposure to toxic substances generated during tobacco combustion, which can lead to diseases (Costanzo and Baker, 2020).

While global tobacco use prevalence declined between 1990 and 2019, similar progress has not been made for chewing tobacco. In 2019, 273.9 million people aged 15 and above used chewing tobacco, primarily in the South Asian region. Addressing the health effects of chewing tobacco requires stronger

regulations and policies targeting its use, especially in regions with high prevalence (GBD, 2019).

3. MEASURES IN THE CONTROL OF TOBACCO PRODUCTS IN THE REPUBLIC OF SERBIA

Serbia stands alone in this region of Europe as the only country where the Law on the Protection of the Population from Exposure to Tobacco Smoke hasn't effectively curbed indoor smoking, leaving more than two-thirds of the population, who do not smoke, unprotected. This is due to a lack of political will, which has led to relaxed smoking bans in hospitality establishments. Smoking is permitted in special rooms in establishments with a total usable area exceeding 80m² and not part of another smoke-free zone. Hospitality venues under 80m² can choose to allow or prohibit smoking in designated areas (Official Gazette of RS, 30/2010).

Despite the annual celebration of "National No Tobacco Day" on January 31 in Serbia, results have fallen short of expectations. Currently, 31.9% of residents aged over 15 smoke, with the highest number of smokers in the 45-54 age group at 41.3% (Institute of Public Health of Vojvodina, 2024). According to a population health survey in Serbia, 14.4% of high school students aged 15-19 smoke, and 3.3% use electronic cigarettes or similar devices either daily or occasionally (Statistical Office of the Republic of Serbia, 2021).

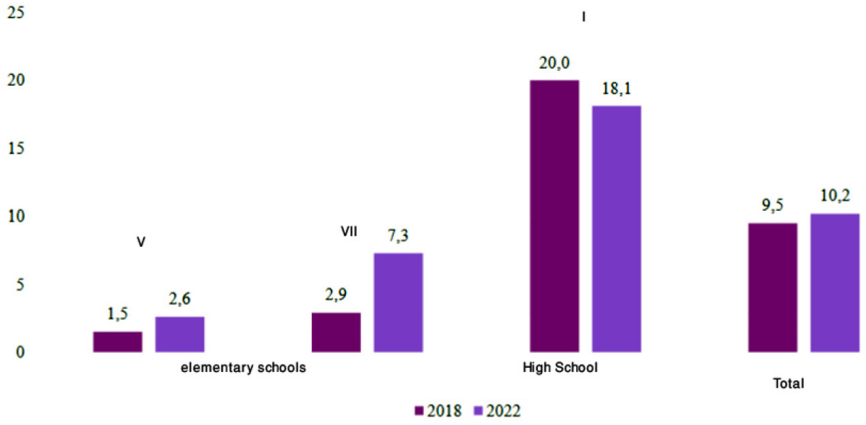
Table 1. Frequency of smoking of tobacco products (daily or occasionally) by sex and age

	Smoking 15+	Smoking 15-19	Smoking 20+	Smoking 18-64
Females, %	30,1	12,9	31,1	35,1
Male, %	33,9	16,1	35,0	38,8
Serbia, %	31,9	14,4	32,9	36,9

Source: Statistical Office of the Republic of Serbia, 2021

Among fifth and seventh-grade elementary school students in 2022, compared to 2018, the percentage of those who tried cigarettes increased. However, among first-grade high school students, this percentage decreased from 28.3% to 24.6%

Graph 1. Percentage of smokers, according to class and year of research, 2018 and 2022, Serbia



Source: Kilibarda, 2024.

Quitting smoking can be achieved in several ways: (Institute of Public health of Vojvodina, 2024)

I. Behavioral methods: self-training and counseling with individual access, group access and telephone or internet;

II. Pharmacological methods: nicotine replacement therapy and non-nicotine drugs (bupropion and cytisine);

III. Combined methods

4. CONCLUSION

Smoking represents one of the most widespread public health problems globally, with the solution lying in ongoing preventive efforts that yield both health and economic benefits. Zero tolerance is advocated for controlling tobacco product use indoors, alongside increased funding for campaigns aimed at reducing the number of smokers, particularly among the younger population. Strategic measures to regulate tobacco product use, enhancing protection from tobacco smoke, should include an outright ban on smoking in workplaces and public spaces, prohibition of tobacco company advertising and sponsorship, and mandatory graphic health warnings on all tobacco product packaging. Continuous education and information dissemination should also play a role in raising awareness about the consequences of smoking, promoting a smoke-free lifestyle as a healthier and higher-quality way of living.

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