



The Effect of Alcohol Consumption on Demographics, Population Health and Social Wellbeing in Poland

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Abstract

Alcohol consumption in Poland has almost doubled between 2002 and 2018 from 6.5 to 11.7 litres of alcohol per adult inhabitant. Such rises have resulted in an epidemic of alcohol-related diseases which have thereby become one of the main factors affecting average life expectancy; this actually rose during 2013–2017 but then fell in 2018. A study undertaken on 52 OECD countries, (Organisation for Economic Co-operation and Development), projected a 1.6 year decrease in life expectancy in Poland due to alcohol-related disease and injury by 2050. Health-related alcohol abuse is influenced by alcohol's widespread availability and relatively low price, and the ineffectual enforcement of legal regulations for the sale of alcohol to minors. An increased availability of alcohol also fuels demand for alcoholic beverages, which in turn increases the risk of numerous injuries, accidents, aggressive behaviour, domestic violence and criminal or suicidal tendencies. An increased burden is now being placed on the state health care system due to the absence of an appropriate national policy regarding the harmful effects of drinking alcohol. Such policies should therefore be re-targeted on decreasing the availability of alcohol in order reduce harmful drinking behaviour that adversely and directly impact on health and society.

Key words: *alcohol consumption, demography, population health, social well-being, mortality*

Introduction

Statistics show that consumption of alcoholic drinks has varied over the last dozen years in Poland depending on the socio-economic climate prevailing during this time. An almost twofold increase in consumption was observed over 2002–2018 for every adult inhabitant, which has resulted in Poland being one of the league leaders in the total volume of alcohol consumed in Europe [1, 2].

This has led to an outbreak of alcohol-related diseases and injuries that are one of the principal factors for declining life expectancy in Poland [3–5]. An OECD on 52 countries has estimated that average life expectancy in Poland will fall by 1.6 years in 2050 [2]. The amount of alcohol drunk is not the only determinant of harm to health and social interaction; the structured ways and patterns that alcohol is drunk also need to be considered. Indeed, the WHO has defined the following aspects that lead to harmful alcohol consumption: the amount of alcohol drunk, frequency of drinking, grades of drinking patterns (occasional, regular, heavy episodic drinking [HED]) and social context, particularly if adversely affecting life in society [6].

Study Aim

To investigate and discuss the effect of alcohol in Poland on its demographics, population health and society.

Current knowledge

Alcohol drinking patterns in Poland

Alcohol consumption has been estimated at 3.7 litres of pure alcohol per person per year prior to the outbreak of World War I [7]. During the inter-war period, alcohol consumption in Poland did not exceed the limits of 2 litres of pure alcohol per capita. There was a clear downward trend observed at these times up until 1933 which was the culmination point of the grave economic

crises of the 1930s. As the national economy became steadily more stable in 1935–1939, a slight increase in alcohol consumption of beverages was noted followed by a clear upward trend during World War II [7]. After the war, economic and social changes in the population were accompanied by increasing demands for all kinds of manufactured products, mainly industrial, including those of the alcohol-spirits manufacturing industry. Alcohol consumption continued to rise further after World War II [3], where a rate of 2.5 litres of pure alcohol per inhabitant was seen in 1947; however, rates were found to be constant between 1954 and 1957, hovering around 3.1–3.2 litres, and then slowing down at the turn of 1957/1958. In 1958, alcohol consumption stood at 3.7 litres, which remained unchanged until 1964 when it rose to 3.9 litres [7, 8]; this resulted from anti-alcohol government policies, such as reducing the number of alcohol retailers and placing restrictions on times of sale as implemented by local government under 1959 legislation, which also importantly introduced an alcohol pricing policy. A successive rise in alcohol consumption was observed, which reached 9.2 litres per adult inhabitant in 1978, despite there being a slowdown between 1970 and 1974 due to increased alcohol prices. At the beginning of the 1980s, rates decreased to 8.4 litres of pure alcohol and continued to fall to 6.3 litres in 1984 which was related to the rationing of alcoholic beverages at that time. Annual alcohol consumption rates increased to 7.5 litres in 1985, but then fluctuated at 6–7 litres per capita during 1985–2002; this being at a moderate European level [9, 10]. After 2002, excise duty on spirits was reduced by 30% and advertising of alcoholic drinks was permitted; indeed, TV adverts on beer had in fact been allowed since 2001 [11]. An almost twofold jump was recorded from 6.5 litres in 2002 to 10 litres in per capita in 2017 arising from the widespread availability and the relatively low price of alcoholic drinks [1, 2]. The latest report from the Organization for Economic Cooperation and Development (OECD) showed that in 2018 the average consumption of pure alcohol per adult inhabitant was 11.3 litres; however, this was higher in Poland at 11.7 litres of pure alcohol [2], being equivalent to more than 2.4 bottles of wine or 4.5 litres of beer per week per person over the age of 15 years. Nevertheless, the average volume of alcohol consumption per capita is

underestimated because of the unofficially recorded alcohol consumption of home-produced products, leading to a higher figure of consumption estimated to actually oscillate around 15 litres.

An increase of 0.23 litres was however noted by the Polish Central Statistical Office in 2019, thereby achieving an all-time record [10], mainly due to the sale of vodka in small 100 ml and 200 ml bottles, commonly known as 'monkeys'. According to a Synergion study, such 'monkeys' were daily bought by 3 million Poles in 2019 [12], but this fell by one third in the first half of 2021 when the so-called 'sugar-tax' was introduced to encourage the choosing of healthy foodstuff products and beverages. Nonetheless, this doesn't mean that alcoholic drinks were not selected. Indeed, larger bottles of alcohol were purchased to compensate, since they were not liable to this additional taxation (Figure 1).

Adult attitudes shape how adolescents become introduced to alcohol. Studies have shown that parents, as well as adolescent peers, mostly determine a teenager's decision on drinking and whether they do so before the age of 18 years. A clear association has been found with the lifestyle of the parents [13]. An OECD report from 2019 shows that over 60% of teenagers aged over 15 years drink alcohol in Poland, and one in five reported actually being drunk twice. Moreover, one in five teenagers under 15 years get drunk at least once a month [2]. A ESPAD survey in 2019 showed that 11% of students aged 15–16 and 19% of students aged 17–18 had been drunk at least once in the 30 day period prior to the study, to such an extent that they couldn't walk straight, had slurred speech and suffered from memory loss of previous events [14]. The term 'binge drinking' is hereby referred to as consuming on any one occasion over 5 or more drinks (each equivalent to 70 g of ethanol) for men and 4 or more for women, whilst the term 'being drunk' refers to when such binge drinking is repeated [15, 16]. An early start to drinking alcohol inhibits the normal development of the body. Furthermore, heavy and frequent drinking during adolescence adversely affects the growth and integrity of certain brain structures. Alcohol use during adolescence is associated with accelerated decreases in grey matter and attenuated increases in white matter volume, and aberrant neural activity during

executive functioning, attentional control, and reward sensitivity tasks, when compared to non-drinking adolescents [17]. The most frequently consumed adolescent drinks are: beer – 74%, vodka – 62% and wine – 43% [2].

The toxic effect of alcohol differs with respect to gender, as it manifests itself differently among women drinkers than among men. In 1993, the level of alcohol consumption differed most strongly in terms of gender. Men drank over five times more than women. Over time, we perceive another disturbing phenomenon. Since then, CBOS studies have worryingly shown that the highest rate of drinking was found in women aged 25–34 years (93%), whilst the lowest was for those women aged 65 years and over, at 63%. Furthermore, studies showed that men aged 45–54 years predominately drink alcohol most often at a rate of 99%, but less frequently when older (>83% when aged over 65 years). At younger ages below 35 years, rates of drinking are similar for both males and females; however, there is a significant gender difference in the oldest age group of 20%. Today's 18–24 year-olds differ significantly from their peers of 10 years ago. At that time, 98% of such males drank alcohol, whilst this fell to 90% in 2019. Women's rates for this age group however rose to 89% (a 10% increase) [18]. ESPAD studies have shown that differences between boys and girls drinking have become blurred over the last eight years. Girls had demonstrated slightly higher rates of drinking than boys during the last 30 days prior to the studies; this being also observed in other Polish studies [2]. An OECD report for 2018 showed that Polish women drink 5.6 litres of pure alcohol per capita annually, whilst men drink 18.4 litres [9]. Women are physiologically more susceptible to the harmful effects of alcohol than men, which is associated with a greater amount of adipose tissue and less fluid in their bodies resulting in higher concentrations of alcohol in the blood. Moreover, the female body contains approximately 70–80% less alcohol dehydrogenase compared to men, which is an enzyme responsible for metabolising ethanol [19]. Even though women drink considerably less spirits than men, the number of women and girls excessively consuming alcohol has been increasing in recent years with levels approaching those in men. Studies have suggested that women, more so than men, experience cerebral dysfunction, (including anxiety and depressive mood disorders),

hormonal dysfunction, fractures and injuries caused by road accidents and acts of violence. Drinking alcohol during pregnancy is especially dangerous with estimated rates varying between 25% and even 50%. Such behaviour is detrimental to foetal development, frequently causing premature births and spontaneous abortions. The most serious complication is the so-called Foetal Alcohol Syndrome (FAS), which is manifested by slower in-uterine growth and growth after birth, craniofacial defects (e.g. flat face, divergent strabismus, lack of a labrum, thin upper lip), and mental retardation [20].

Alcohol preferences depend on socio-demographic factors. Men mostly drink beer (56%), whilst women mostly drink wine (45%). Interestingly, high-grade alcohol, such as cognac or whiskey, is most frequently chosen by 11% of both men and women. Beer definitely outclasses other beverages in the youngest group of respondents (18–24 years olds), with rates of 63%, whereas the following age group (25–34 years) chose beer much less frequently (39%), then followed by wine (31%). Around every one in three respondents aged over 45 years declared that beer was their favoured drink; moreover, vodka consumption was also increasing, by more than one in five (22%) for respondents aged 55–64 years and more than one in four (26%) of those aged over 65 years [18].

The effect of drinking alcohol on Polish demographics

Life expectancy has decreased in part due to the rapid increase in the consumption of alcoholic beverages. After the end of World War II, life expectancy for both sexes was gradually increasing, which at the beginning of the 20th century had stood only at 40 years. Between 1960 and 1990, life expectancy improved slightly, especially for men; in the 1990s, it became 66.2 years for men and 75.2 years for women. It then improved further by 4 years for men and 3 years for women. However, the 21st century witnessed the first decline in premature mortality amongst young people and middle-aged adults in 2003, which coincided with a sharp increase in alcohol consumption in Poland. Average life expectancy in Poland increased by about 5% in women and 7% in men during 1991–2002, followed by 0.1% yearly increases during

2003–2007. It then increased by 0.3% in women and 0.6% in men throughout 2008–2013 and further increased during 2013–2017. However, in 2018 the average life expectancy fell in Poland [5, 19]. It can be presumed that this was due to the nearly twofold increase in alcohol consumption recorded in 2002–2019. In 2019, average life expectancy for men was 81.8 years and 74.1 years for women (Figure 2). Studies undertaken in 52 OECD countries demonstrate that life expectancy by 2050 will drop by 0.9 years, where the biggest drops are forecast in the countries of Central and Eastern Europe [2]; life expectancy in Poland will become reduced by 1.6 years due to disease and injuries caused by alcohol consumption. These estimates are based on women having one drink a day and 1.5 drinks for men.

The effect of drinking alcohol on health and social wellbeing in Poland

The body's biological susceptibility to alcohol can be influenced by genetic factors, health, gender and age. American studies on genetic mechanisms found that this susceptibility may be influenced by changes in some of the genes responsible for coding the enzymes involved in alcohol metabolism and in those genes that shape the brain's responses that are responsible for encoding receptors in neurons [20]. The adverse impact of excessive alcohol consumption, leading to addiction, is a hereditary, genetically determined trait [21].

The effect of alcohol on the human body depends on the dose, intensity, type of alcohol consumed and inter-individual variability [22–24]. Numerous pathological changes are caused by the toxic effects of ethyl alcohol and its metabolites, particularly acetaldehyde. The body's absorption of alcohol already begins in the mouth. Alcohol then reaches the stomach, duodenum and intestines, and from there the cerebral cortex which is responsible for processing signals governing human behaviour. By such ways, changes to the digestive system occur when directly exposed to alcohol, such as chronic inflammation of the mucous membranes, mouth, oesophagus, stomach, duodenum, pancreas and liver, as well as disrupted intestinal peristalsis. Such changes lead to the development of neoplastic disease, including in the oesophagus, mouth, pharynx, colon and rectum [21, 25].

The first effects of alcohol that become apparent are however neurotoxic which are noticeable within the peripheral and central nervous system (CNS). Initially, degeneration occurs in the frontal and temporal lobes, and further increases in alcohol intoxication lead to disruptions to the centres responsible for visual-motor coordination in the cerebral cortex. Ultimately, the functions of the cerebellum may become damaged causing problems in maintaining the body's balance [26]. The risk of dementia is increased by heavy alcohol consumption as demonstrated by a study on 30 million hospitalised patients in France. Over 50% of all diagnosed dementia in patients under the age of 65 was due to alcohol abuse. Other studies show a close relationship between alcohol, the risk of dementia, and the presence of apolipoprotein E4 (APOE E4). This gene is associated with an increased risk of Alzheimer's disease in people aged over 65 years [27].

The prevalence of alcoholism per a given population increases or decreases according to increases or decreases in alcohol consumption by that population. The rapid increase in drunkenness caused a sudden deterioration in public health during the first half of the nineteenth century and thus restrictions were placed on vodka production [8]. The liver is the body's most vulnerable organ to alcohol due to its detoxification function, achieved by enzymatic processes whereby the main transformations of alcohol take place. The first stage of the pathology is alcoholic liver disease, which then leads onto the following: steatosis, inflammation, fibrosis, cirrhosis and cancer. There was a sharp increase in the consumption of alcohol in Poland during 2003–2017, which has contributed, *inter alia*, to an increase in mortality due to alcoholic cirrhosis by 630% in women and 260% in men [3]. Long-term and intensive alcohol consumption is associated with the development of cardiovascular diseases, such as hypertension, arrhythmia, alcoholic cardiomyopathy, (a degenerative change in myocardial fibres), steatosis, and cardiac enlargement [28–30]. Strokes deserve special attention, being the second most common cause of death in the world among adults and the fourth most common cause of disease burden. Heavy alcohol use is also associated with an increased risk of ischaemic and haemorrhagic stroke. It is estimated that as countries around the world become richer, alcohol consumption will

increase, and thus the number of deaths from stroke will continue to rise. Without efforts to increase effective alcohol control measures, the number of deaths from stroke, especially in economically developing countries, will increase by 1.3 million, reaching 7.8 million by 2030 [31, 32].

Chronic alcohol abuse leads to mental malfunctioning, causing stress-induced emotional disturbances, insomnia, depression, and anxiety. The result of the above may be such diseases as: Korsakoff's psychosis or Wernicke-Korsakoff's syndrome, alcoholic dementia, alcoholic delirium, alcoholic hallucinosis, alcoholic epilepsy [33].

The WHO has defined a strategy to reduce harmful alcohol consumption, setting priority areas for global action in order to deal with the ever-increasing burden of alcohol-related disease [34]. The health consequences of alcohol abuse are influenced by its widespread availability, relatively low price, advertising campaigns for promoting alcohol consumption, especially beer, and ineffective enforcement of legal regulations on the sale of alcohol to minors. Increasing the availability of alcohol leads to a greater demand for alcoholic drinks, which in turn increases the risk of numerous injuries occurring, of accidents, aggression, domestic violence as well as criminal or even suicidal behaviour. A causal relationship has been demonstrated in a large body of literature between drinking alcohol and all types of inadvertent trauma and suicide attempts. Alcohol increases the risk of problems in the family and society, which accounts for 40–60% of deaths and injuries, which has been intensely observed in Poland [35].

Conclusions

The burden placed upon the state health care system due to the harmful consequences of drinking alcohol stems from the lack of having an appropriate national policy on alcohol. Such policies should thus be re-focused on reducing the availability of alcohol, so as to limit hazardous and harmful drinking, which is a direct cause of ill-health and societal problems.

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Figure 1. Average annual consumption of alcoholic beverages per capita in liters per 100% alcohol

Source: State Agency for Solving Alcohol Problems [www.parpa.pl/index.php/badania-i-informacje-statystyczne/statystyki].

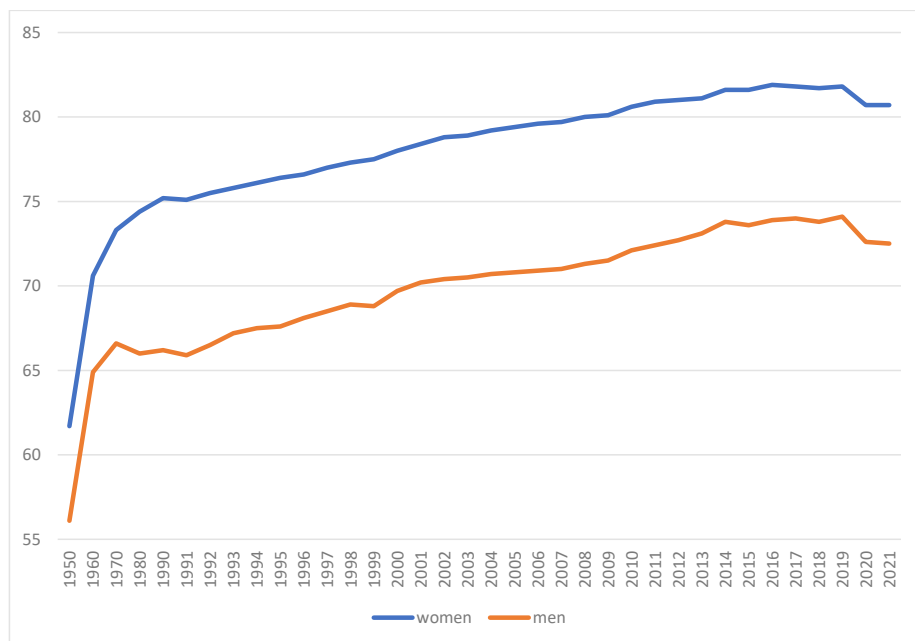


Figure 2. Life expectancy of women and men in 1950–2021

Source: [<https://stat.gov.pl/obszary-tematyczne/ludnosc/trwanie-zycia>].