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# Evaluation of the Estonian Green Paper on Alcohol Policy

# Abstract

The *Green Paper on Alcohol Policy* has been Estonia's strategy document for addressing alcohol-related harms since 2013. Its objectives include: reducing alcohol consumption and curbing harmful drinking patterns; preventing underage drinking; minimizing alcohol-related crime, social problems and health damage; and developing treatment and rehabilitation services for alcohol dependence.

This technical report evaluates the public health impact of the *Green Paper* and associated policies, providing evidence-based insights for future alcohol control efforts in Estonia. The evaluation analyses alcohol consumption and related harms in Estonia from 2000 to 2023, focusing on periods before and after the implementation of the *Green Paper's* recommendations.

Following the *Green Paper's* adoption (2013–2019), adult per capita alcohol consumption in Estonia decreased notably. Key indicators, such as age-standardized all-cause mortality and life expectancy at birth, demonstrated positive trends until the onset of the coronavirus disease pandemic. Evaluation of specific indicators revealed mixed outcomes: while there was a notable reduction in alcohol consumption and intoxication among minors, the target of reducing the annual population alcohol consumption to under 8 L per capita was not achieved. Although policy implementation coincided with decreases in alcohol-attributable injuries and mortality rates, it is challenging to attribute these improvements solely to the *Green Paper*.

## Keywords

ALCOHOL DRINKING – prevention and control

ALCOHOL – adverse effects

ESTONIA

HEALTH POLICY

RISK FACTORS

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# Evaluation of the Estonian Green Paper on Alcohol Policy

# Contents

Acknowledgements	iv
Abbreviations	v
Executive summary	vi
<b>1. Context and aims of the study</b>	<b>1</b>
1.1. Brief overview of the development of Estonian alcohol control policy	2
1.2. Alcohol consumption and the burden of mortality and disease in Estonia	2
1.2.1. Trends in age-standardized alcohol-attributable disease burden between 2010 and 2019	2
1.2.2. Alcohol-attributable disease and mortality burden in 2019	3
1.3. Alcohol consumption patterns and alcohol consumption as a public health problem in Estonia	5
1.4. Aim and scope of the study	8
1.5. Analytical approach, data and methods	10
<b>2. Results</b>	<b>12</b>
2.1. Impacts on the level of alcohol consumption	13
2.1.1. APC	13
2.1.2. Indicators of alcohol consumption by minors	15
2.2. Impacts on alcohol availability	17
2.3. Impacts on mortality and life expectancy	19
2.3.1. All-cause mortality and life expectancy	19
2.3.2. Alcohol-attributable injuries and fatalities following injury: measuring a formal indicator of the <i>Green Paper</i>	20
2.4. Alcohol-attributable morbidity, treatment and costs in Estonia	21
2.5. Social harm associated with alcohol use	23
2.5.1. Traffic indicators	23
2.5.2. Crime indicators	25
2.6. Statistical evaluation of single policy measures in Estonia: taxation	26
2.6.1. Level of alcohol consumption	26
2.6.2. Mortality indicators	26
2.6.3. Changes in excise taxes for alcohol and cross-border trade	27
2.6.4. Tax revenues	27
2.7. Public perception of and expert opinion on alcohol control policies and the impact of the <i>Green Paper</i>	28
2.7.1. Public perception	28
2.7.2. Experts' perspectives	29
<b>3. Policy considerations</b>	<b>31</b>
<b>Annexes</b>	<b>34</b>
Annex 1. Supplementary figures and tables	35
Annex 2. Mapping the Green Paper's proposed measures to the WHO Global Strategy to reduce harmful alcohol use	41
Annex 3. Alcohol policy expert survey: methodology and key findings	46
<b>References</b>	<b>52</b>

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# Abbreviations

<b>AAF</b>	alcohol-attributable fraction
<b>APC</b>	alcohol per capita consumption
<b>GAM</b>	generalized additive model
<b>COVID-19</b>	coronavirus disease
<b>CI</b>	confidence interval
<b>DALY</b>	disability-adjusted life-year
<b>EU</b>	European Union
<b>HBSC</b>	Health Behaviour in School-aged Children (study)
<b>ICD-10</b>	International Classification of Disease, tenth revision

# Executive summary

The *Green Paper on Alcohol Policy* (in this document abbreviated to *Green Paper*), the national alcohol policy strategy document addressing alcohol-attributable harms, has been the framework for Estonian alcohol control policy since 2013. The national alcohol policy objectives stated within the *Green Paper* are to:

- ▶ reduce total alcohol consumption;
- ▶ reduce harmful consumption;
- ▶ prevent alcohol consumption by minors;
- ▶ ensure a safe environment and reduce alcohol-related crime, social problems and health damage; and
- ▶ develop treatment and rehabilitation services for motivated people with alcohol dependence.

The overall aim of this study is to assess the public health impact of the *Green Paper* and the resulting policies, as evidence-based input is needed for both the review of the effectiveness of current measures and for further policy development aimed at reducing alcohol-attributable harms in Estonia. The evaluation that was carried out as part of this study will present an analytical overview of alcohol consumption and alcohol-attributable harms in Estonia between 2000 and 2023, examine the outcomes of predefined indicators, evaluate the overall public health impact of selected policy measures and provide data-driven policy considerations for the improvement of alcohol control policies in Estonia.

Using diverse sets of data on alcohol policy and population health, this evaluation focuses on the time period between 2000 and 2023 (depending on the available data), and distinguishes between several significant periods before and after the implementation of the *Green Paper's* recommendations in 2013. To contextualize these results, comparisons with neighbouring Baltic countries and Poland are provided, along with perspectives from both Estonian experts on alcohol use and members of the public.

The level of alcohol consumption among the Estonian population, measured as alcohol per capita consumption (APC) in persons aged 15 years or older (in litres of pure alcohol), was significantly lower between 2013 and 2019 compared with before 2013 (that is, during the core period after the adoption of the *Green Paper*). Both key indicators for attributable harm – age-standardized all-cause mortality and life expectancy at birth – demonstrated steady decreases and increases, respectively, until the coronavirus disease (COVID-19) pandemic began.

However, these indicators had already begun to change prior to the adoption of the *Green Paper*. The effects of a substantial taxation decrease and of the COVID-19 pandemic on both alcohol consumption and health indicators in Estonia have been clearly evident, leading to an abrupt halt in the increase in life expectancy, the polarization of drinking patterns and marked increases in 100% alcohol-attributable mortality.

Table ES1 gives an overview of all key indicators during the core period of the *Green Paper* (2013–2019) compared with the period directly before its adoption, and with the period from the onset of the COVID-19 pandemic.

**Table ES1.** Alcohol-related outcome indicators during the core period after the *Green Paper's* adoption

Indicator	Description of change	Section of the report
Level of alcohol consumption	Significantly decreased from the period prior to adoption, as well as in comparison with trends in Latvia and Poland; change in trends, so causal interpretation is likely. However, the decrease did not reach the official target of the <i>Green Paper</i> of 8 L per capita. <sup>a</sup>	2.1
Alcohol consumption of minors: use, intoxication and age of initiation	Use and intoxication decreased significantly in comparison with the period prior to adoption. However, alcohol indicators of minors improved in almost all European Union countries in this period of time.	2.1
Availability	Most availability indicators remained unchanged, but density of sales outlets increased.	2.2
All-cause mortality	Significantly decreased, but there had been a secular trend before, so this decrease cannot be causally attributed to the <i>Green Paper</i> . All-cause mortality increased with the onset of the COVID-19 pandemic.	2.3
Life expectancy	Significantly increased, but there had been a secular trend before, so this increase cannot be causally attributed to the <i>Green Paper</i> . Life expectancy decreased during the COVID-19 pandemic.	2.3
Injury and injury fatalities	Significantly decreased during the core period after the <i>Green Paper's</i> adoption, but there had been a secular downward trend before, so this decrease cannot be causally attributed to the <i>Green Paper</i> .	2.3
Traffic	The alcohol-attributable fraction (AAFs) for the number of people involved in traffic accidents and for traffic injuries decreased significantly. The AAF for traffic fatalities did not change significantly. AAFs increased during the COVID-19 pandemic.	2.4
Crime	Significant decrease in crime, but a secular trend cannot be excluded. Crime continued to decrease during the COVID-19 pandemic.	2.5

Notes: AAF: alcohol-attributable fraction.

Highlighted indicators refer to the formal target indicators specified by the *Green Paper*.

<sup>a</sup> While it is customary to measure the population level of consumption in the adult population only (defined as age 15 years and older) in order to have some control over changes in the age distributions of populations, the *Green Paper's* objectives were formulated for the whole population without any age restriction. The customary definition is used in this paper, but, in the sections where the attainment of the formal objectives of the *Green Paper* are measured, no age restriction is used.

Thus, in terms of the explicit outcome indicators set for Estonian national alcohol policy in the *Green Paper*, the following conclusions can be made.

1. Despite substantial gains in the core period following the *Green Paper's* adoption, the numeric objective of a decrease in the annual population alcohol consumption to below 8 L per capita (without age restriction; see footnote 1 above) was not reached. Although a decline in alcohol consumption per capita can be observed in the period following the *Green Paper's* adoption, which had a start point of 10.0 L per capita in 2013, the lowest consumption level reached was 8.4 L per capita in 2018.
2. The core period following the *Green Paper's* adoption was associated with a marked decrease in alcohol use and intoxication of minors, and, overall, the age of initiation of alcohol consumption increased. However, similar patterns can be found in most countries in the European Union and the trend may have started before the recommendations of the *Green Paper* were implemented, so the contribution of the measures outlined in the *Green Paper* is not clear.
3. While alcohol-attributable injury indicators were lower during the core period following the *Green Paper's* adoption, this can be regarded to be a continuation of the earlier secular trend. Thus, the contribution of the *Green Paper* to this trend cannot be clearly delineated.

As the *Green Paper* is essentially a strategy document outlining the overall aims and direction for a national alcohol policy, the public health effects of the *Green Paper* can be expected to arise from its distinct policy actions. By distinguishing between substantial taxation increases (that is, taxation increases that resulted in the reduction of the affordability of alcoholic beverages) and availability restrictions (that is, relative decreases in off-premises purchasing hours by more than 20%), three distinct events can be seen to have occurred between 2013 and 2019: excise rate changes in the years 2016, 2017 and 2018. These events were associated with an average decrease in APC consumption of 0.83 L of pure alcohol in the same year that the alcohol control policies were implemented. The results from comparative interrupted time-series analyses of both all-cause and 100% alcohol-attributable mortality revealed that substantial taxation and alcohol availability changes, between the years 2000 and 2020, resulted in the reduction of male age-standardized all-cause mortality by 2.3%, and of male 100% alcohol-attributable mortality by 7.6% in the year after implementation of the policy. The effect was modelled on a monthly basis, starting in the month that the policy was first implemented. However, the corresponding reduction in female all-cause mortality of 1.1% was not statistically significant, while female 100% alcohol-attributable mortality decreased by 10.8%. The effects correspond with an average of 89 male deaths averted from all causes (the number for females is not given, because the effect was not statistically significant), and 43 100% alcohol-attributable deaths averted (29 males and 14 females) in the years after the implementation of the above-described policy changes.

Despite these successes, expert and public opinion regarding the impact of Estonian alcohol control policy is mixed. Experts evaluated the purposefulness of the *Green Paper's* initiatives relatively highly, but lower ratings were given to the implementation and outcomes of these measures, resulting in a mediocre mean score for Estonian alcohol policy. Lack of political will and inadequate leadership were the most often-mentioned obstacles in the implementation of alcohol policy. Data from public opinion polls collected between 2012 and 2022 indicate that support for strict alcohol control measures declined during the period in which the *Green Paper* was published and directly after its adoption.

Based on the evidence-based literature and empirical results of this study, the following policy considerations are proposed to reduce alcohol consumption and related harms in Estonia. National legislative, executive and public health authorities should consider:

- ▶ increasing alcohol excise taxation to reduce the affordability of alcoholic beverages and reduce consumption and attributable harms;
- ▶ increasing the capacity of the treatment and care system for alcohol-attributable problems and alcohol use disorders;
- ▶ implementing further availability restrictions, such as limitations on the density of sales outlets, further limiting purchasing hours (for example, limit sale hours on Sundays), prohibiting the sale of alcohol in gas stations, restricting hours for on-premises drinking, establishing a licensing system and banning internet sales of alcohol; and
- ▶ continuing to routinely closely monitor and evaluate all alcohol policy interventions.

# 1. Context and aims of the study

## 1.1. Brief overview of the development of Estonian alcohol control policy

Estonia, the northernmost Baltic country with a population of 1.32 million people, regained independence in 1991. The radical reforms of the early 1990s and societal transformations from a state-run planned economy to a free-market democracy were accompanied by a deterioration of population health, with life expectancy at birth declining from 69.6 years in 1991 to 66.5 years in 1994. Although alcohol use contributed substantially to the underlying increase in mortality (1–3), the field of alcohol control was guided by free-market principles with few to no restrictions on advertising or on the availability of alcohol (4).

Although the first steps towards a consistent alcohol control policy were made at the end of the 1990s with the passing of the Advertising Act (5) and the Alcohol Act (6), a more systematic approach to alcohol policy appeared in the 2000s. These changes were partly driven by regulatory requirements associated with joining the European Union (EU) in 2004, but the public health aspects of alcohol control were also increasingly being recognized (7). The latter is exemplified by the adoption of the *National Health Plan 2009–2020* (8) and the implementation of a large-scale prevention programme called Measures to support healthy choices (9). The positive change towards more regulated alcohol policy was demonstrated in a comparative analysis of alcohol legislation in European countries (10), which placed Estonia (along with Latvia, Lithuania and Poland) in the middle of the field in the ranking of the intensity of their alcohol control policies in the mid-2000s.

The *Green Paper on Alcohol Policy* (11) (henceforth the *Green Paper*), drafted in 2012 and approved by the Estonian government in 2014, presented the first coherent strategy for national alcohol policy. It defined the overall purpose of the alcohol policy from a societal perspective and emphasized the public health aspects relating to alcohol-attributable harms. According to the *Green Paper*, the aim of alcohol policy was to reduce its social, economic and health damage; to ensure a supportive environment for children and adolescents; and to change the living environment to make it safer for all people. For this, a comprehensive policy with measures covering the 10 areas indicated in WHO's *Global Strategy to Reduce the Harmful Use of Alcohol* (12) were seen as being paramount in reducing alcohol consumption and harm. Although the prevention of alcohol-attributable harms has been covered in several later national public health guidelines (13,14), the *Green Paper* has been the overarching roadmap for alcohol control policy for nearly a decade. More detailed overviews on Estonian alcohol policy can be found in *Estonian alcohol control legislation in 1990–2020: a narrative review* (4,15,16).

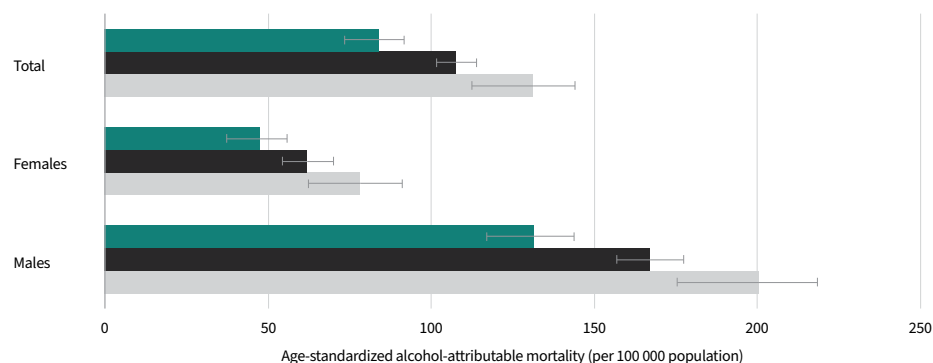
## 1.2. Alcohol consumption and the burden of mortality and disease in Estonia

### 1.2.1. Trends in age-standardized alcohol-attributable disease burden between 2010 and 2019

Fig. 1 and Fig. 2 give an overview of trends in the age-standardized rates of the two main alcohol-attributable disease burden indicators: mortality and disability-adjusted life-years (DALYs) lost. Age-standardization was done based on the WHO standard (17). There has been a clear downward trend for both indicators.

**Fig. 1.** Trends in age-standardized alcohol-attributable mortality rate per 100 000 population, with 95% confidence intervals in Estonia between 2010 and 2019

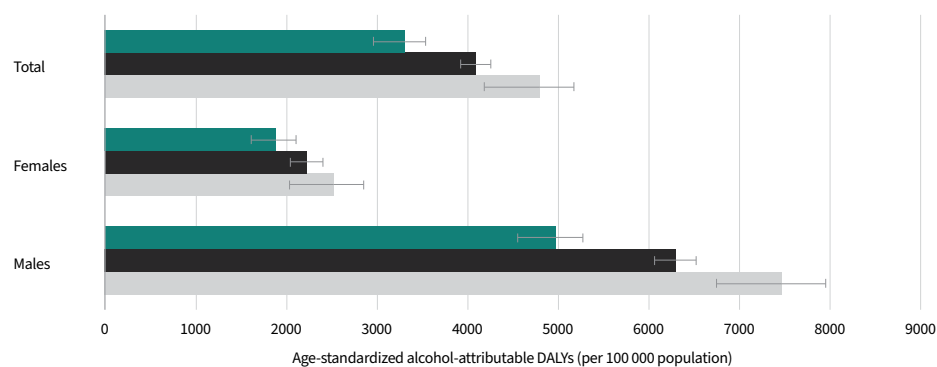
■ 2019  
■ 2015  
■ 2010



Source: (18).

**Fig. 2.** Trends in age-standardized DALYs lost per 100 000 population, with 95% confidence intervals, in Estonia between 2010 and 2019

■ 2019  
■ 2015  
■ 2010



Source: (18).

Specifically, the age-standardized alcohol-attributable mortality rate decreased by 36%, and to a greater extent for females (39%) than for males (34%). Most of this decline was driven by overall declines in all-cause mortality (for details, see Section 2.1), but it should be mentioned that alcohol-attributable mortality decreased slightly faster than mortality attributable to other causes. Thus, in 2010, one in every five deaths (underlying alcohol-attributable fraction (AAF): 19.7%; 95% confidence interval (CI): 17.2–21.8%) in Estonia was attributable to alcohol consumption, whereas a decade later, every one in almost every seven deaths was alcohol-attributable (AAF: 15.2%; 95% CI: 13.2–17.0%).

The burden of disease, measured in DALYs lost, shows similar trends (see Fig. 2). The overall decline in the rate of age-standardized DALYs lost was 31%, and was slightly higher for males (34%) than for females (25%). In addition, AAFs of DALYs lost declined from 18.4% (95% CI: 16.75–19.8%) to 14.8% (95% CI: 13.2%–16.0%).

### 1.2.2. Alcohol-attributable disease and mortality burden in 2019

Based on the latest comparative risk assessment conducted by WHO (18), Estonia experiences considerable alcohol-attributable harms. Thus, for the year 2019, the last year for which data are available, 2310<sup>1</sup> deaths (95% CI: 2000–2580; female deaths: 1030, 95% CI: 870–1200; male deaths: 1280, 95% CI: 1090–1420) could have been avoided in a scenario without any alcohol consumption. This represents 15% of all deaths (95% CI: 13–17%; female deaths: 13%, 95% CI: 11–15%; male deaths: 18%, 95% CI: 15–20%). In other words, almost every sixth male death and almost every eighth female death would have been averted in such a scenario.

<sup>1</sup> The number of deaths was rounded to the next 10.

In terms of burden of disease as measured in DALYs lost, 64 300<sup>2</sup> DALYs (95% CI: 57 100–69 500; 15% of all DALYs lost, 95% CI: 13–16%) were lost overall in 2019. Sex-specific numbers were 22 200 (95% CI: 19 800–24 600) DALYs lost for females and 41 100 DALYs lost (95% CI: 36 800–45 500) for males. This means that more than every fifth male DALY lost and more than every tenth female DALY lost could have been avoided in a scenario without alcohol consumption. Table 1 and Table 2 give an overview of the major causes of death and disease burden, as based on data from WHO (18).

Examining the distribution of causes of death (Table 1), there is a high number of alcohol-attributable deaths caused by cardiovascular diseases, which is typical for countries with a drinking culture that has a high proportion of heavy episodic drinking occasions (for further discussion, see (19–23)). When including non-fatal events, alcohol use disorders become a major category as well (Table 2).

**Table 1.** Total and alcohol-attributable deaths for major causes of death in Estonia in 2019.

Cause	Number of deaths (total)	Number of alcohol-attributable deaths	Age-standardized alcohol-attributable deaths (per 100 000 people), n (95% CI)	Deaths attributable to alcohol among all deaths, % (95% CI)
<b>All causes</b>	15 186	2312 (2004–2579)	83.9 (73.4–91.8)	15.2 (13.2–17.0)
<b>Communicable diseases</b>	544	121 (92–143)	3.7 (2.8–4.4)	22.2 (16.8–26.3)
Tuberculosis	16	4 (2–6)	0.2 (0.1–0.2)	25.7 (13.6–35.5)
STDs excluding HIV	1	<0.5	0.0 (0.0–0.0)	1.5 (0.3–3.7)
HIV-AIDS	40	3 (1–4)	0.2 (0.1–0.3)	6.8 (3.4–10.1)
Lower respiratory infections	349	114 (86–135)	3.3 (2.5–4.0)	32.7 (24.7–38.7)
<b>Noncommunicable diseases</b>	14 001	1849 (1581–2085)	61.8 (54.0–68.5)	13.2 (11.3–14.9)
Cancer	3869	263 (220–300)	9.7 (8.1–11.0)	6.8 (5.7–7.7)
Diabetes mellitus	146	-4 (-8 to 1)	-0.1 (-0.2 to 0.1)	-2.5 (-5.4 to 1.0)
Alcohol use disorders	148	148 (148–148)	7.7 (7.7–7.7)	100.0 (100.0–100.0)
Epilepsy	45	13 (9–16)	0.7 (0.5–0.8)	28.1 (19.4–35.7)
Cardiovascular diseases	7727	1228 (998–1437)	33.4 (26.0–38.5)	15.9 (12.9–18.6)
Digestive diseases	649	200 (164–231)	10.4 (8.5–12.0)	30.9 (25.2–35.6)
<b>Injuries</b>	641	342 (301–369)	18.4 (16.2–19.8)	53.4 (47.0–57.6)
Unintentional injuries	415	206 (180–223)	10.1 (8.8–10.8)	49.5 (43.4–53.6)
Intentional injuries	226	137 (117–149)	8.4 (7.2–9.1)	60.4 (52.0–65.9)

Note: STDs: sexually transmitted diseases.

Source: (18).

<sup>2</sup> The number of DALYs lost was rounded to the next 100.

**Table 2.** Total and alcohol-attributable DALYs lost by major causes of disease burden in 2019, in Estonia.

Cause	Number of DALYs lost (total)	Number of alcohol-attributable DALYs lost	Age-standardized alcohol-attributable DALYs lost (per 100 000 people), n (95% CI)	DALYs attributable to alcohol among all DALYs lost, % (95% CI)
<b>All causes</b>	433 659	64 295 (57 122–69 507)	3306.5 (2960.5–3539.5)	14.8 (13.2–16.0)
<b>Communicable diseases</b>	19 319	2158 (1607–2566)	93.5 (68.0–111.6)	11.2 (8.3–13.3)
Tuberculosis	506	162 (106–204)	9.11 (6.09–11.3)	32.0 (21.0–40.3)
STDs excluding HIV	193	6 (3–10)	0.4 (0.2–0.7)	3.1 (1.3–5.1)
HIV–AIDS	2096	143 (70–212)	10.4 (5.0–15.3)	6.8 (3.3–10.1)
Lower respiratory infections	5855	1847 (1398–2203)	73.6 (54.6–88.4)	31.5 (23.9–37.6)
<b>Noncommunicable diseases</b>	372 887	40 333 (35 814–44 021)	1843.7 (1662.1–1989.5)	10.8 (9.6–11.8)
Cancer	78 248	5907 (4934–6701)	251.9 (209.2–286.3)	7.5 (6.3–8.6)
Diabetes mellitus	10 821	-297 (-622 to 104)	-11.8 (-26.3 to 6.9)	-2.7 (-5.8–1.0)
Alcohol use disorders	8373	8373 (8373–8373)	504.4 (504.4–504.4)	100.0 (100.0–100.0)
Epilepsy	3163	801 (559–1005)	50.5 (35.01–63.5)	25.3 (17.7–31.8)
Cardiovascular diseases	116 858	18 803 (15 579–21 537)	667.2 (558.3–755.9)	16.1 (13.3–18.4)
Digestive diseases	21 843	6746 (5520–7735)	381.6 (312.5–436.8)	30.9 (25.3–35.4)
<b>Injuries</b>	41 452	21 804 (19 342–23 350)	1369.3 (1213.65–1465.6)	52.6 (46.7–56.3)
Unintentional injuries	31 865	15 924 (14 055–17 151)	939.7 (830.6–1009.4)	50.0 (44.1–53.8)
Intentional injuries	9587	5880 (5093–6354)	429.6 (370.1–465.5)	61.3 (53.1–66.3)

Note: STD: sexually transmitted diseases.

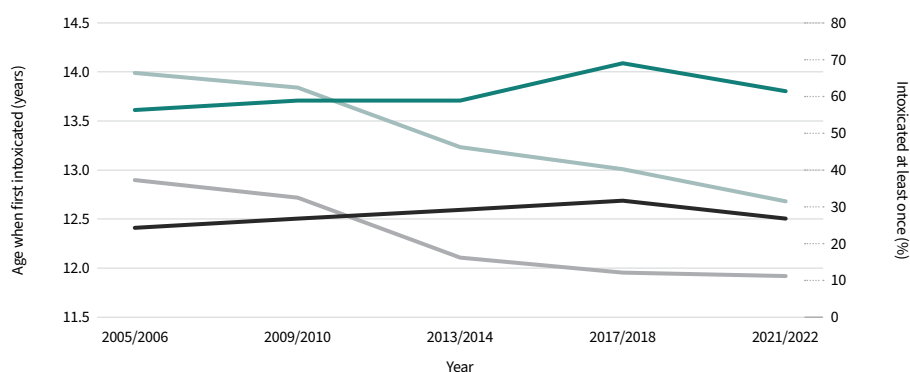
Source: (18).

### 1.3. Alcohol consumption patterns and alcohol consumption as a public health problem in Estonia

Long-term trends in alcohol consumption patterns among adolescents and adults can be identified from repeated cross-sectional surveys (24–26). Some general trends are provided in this section, and statistical testing with respect to different time periods before and after the adoption of the *Green Paper* is described in Section 2.1.

According to data from the Health Behaviour in School-aged Children (HBSC) study on 11-, 13- and 15-year-old Estonian school children, 65.9% of children surveyed had never consumed alcohol in 2022, a considerable change compared to 50.4% of children in 2013–2014 and 60.3% of children in 2017–2018. In addition, the proportion of children who had consumed alcohol on three or more days over their lifetime declined from 30.5% (boys 31.4%, girls 29.6%) in 2013–2014 to 18.4% (boys 17.9%, girls 19.0%) in 2021–2022 (25). The mean age of being intoxicated for the first time increased for both 13- and 15-year-olds between 2005–2006 and 2017–2018 (Fig. 3), but a slight change in the trend is visible for both age groups in the data collected in 2021–2022. However, the prevalence of both 13- and 15-year-olds who have been intoxicated at least once have declined consistently since 2005–2006.

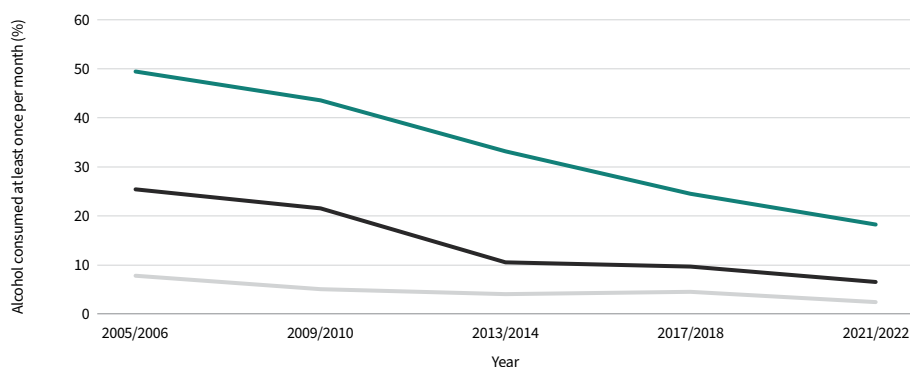
**Fig. 3.**  
Average age when intoxicated by alcohol for the first time and prevalence of being intoxicated at least once among 13- and 15-year-old children, between 2005–2006 and 2021–2022



Source: (25).

Consumption of alcohol at least once per month was reported by 2.2% of 11-year-olds, 6.3% of 13-year-olds, and 18.0% of 15-year-olds in 2021–2022 (Fig. 4). Compared with earlier data, a decline in alcohol consumption among children and adolescents is evident.

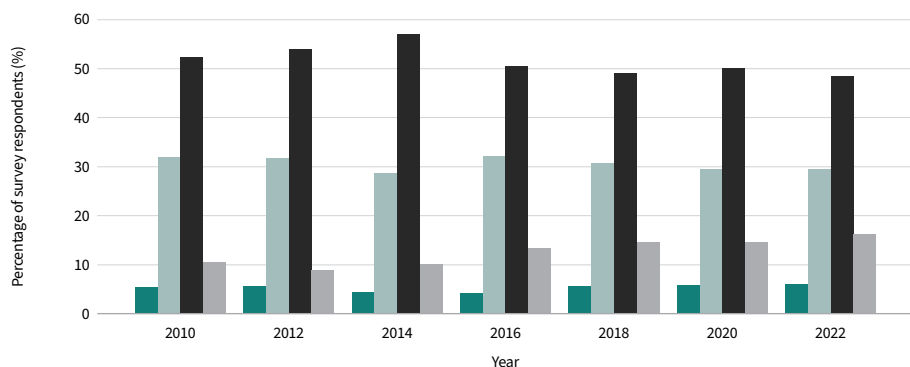
**Fig. 4.**  
Prevalence of 11-, 13- and 15-year-old children reporting that they consumed alcohol at least once per month, between 2004–2005 and 2021–2022



Source: (25).

Among adults, the latest published data from the survey *Health Behaviour among Estonian Adult Population for 2022* (27) indicates that 19.1% of the Estonian population aged 16–64 years (men 28.0%, women 12.6%) consumed alcohol more than once a week during the 12 months prior to the survey being conducted. Consumption of six or more units of alcohol at least once per week was reported by 10.8% of respondents (men 20.6%, women 3.6%), a statistically significant decline compared with the 14.2% of respondents reported in 2014 as part of the same survey (27). Data show that, during the period 2010–2022 (Fig. 5), the frequency of alcohol consumption in Estonia has remained relatively stable, while the proportion of abstainers increased from 10.4% in 2010 to 16.2% in 2022.

**Fig. 5.**  
Frequency of alcohol consumption during the previous 12 months among survey respondents aged 16–64 years in Estonia between 2010 and 2022



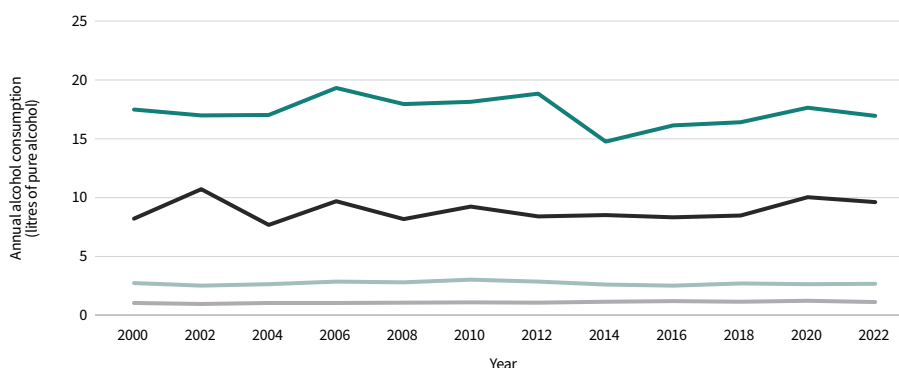
Source: (27).

Self-reported alcohol consumption in the seven days before survey completion indicated that 27.4% of men and 12.2% of women had high-risk consumption levels (>140 g pure alcohol per week for men, >70 g for women) (27). If the weekly mean consumption levels were to be extrapolated to annual alcohol consumption by alcohol consumption level (Fig. 6), the annual consumption level would reach 16.9 L among high-risk alcohol-consuming men and to 9.6 L among high-risk consuming women in 2022. In the same year self-reported high-risk consumers constituted 19.9% of the adult population, but they constituted 71.7% of the total volume of alcohol consumed by 16–64-year-olds.

**Fig. 6.**

Estimated annual alcohol consumption during the previous 12 months among people aged 16–64 years in Estonia, between 2000 and 2022

- Males with high-risk consumption (≥ 140 g pure alcohol per week)
- Males with low-risk consumption (< 140 g pure alcohol per week)
- Females with high-risk consumption (≥ 70 g pure alcohol per week)
- Females with low-risk consumption (< 70 g pure alcohol per week)



Source: (27).

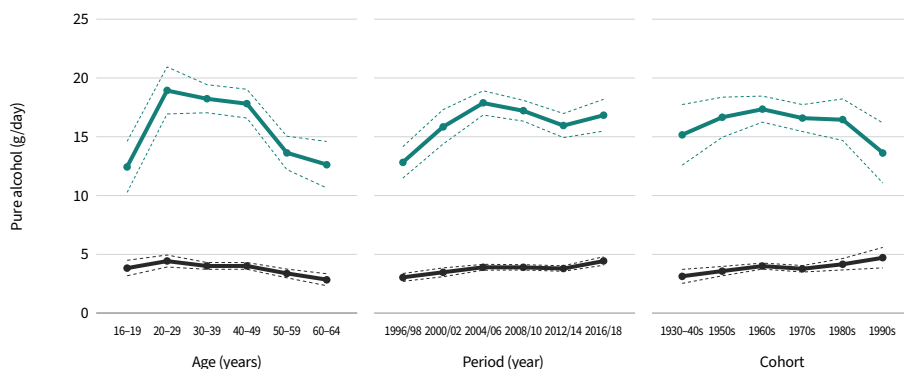
In interpreting these data, the reader should be aware that the data presented here are based on self-reports. Overall, self-reported alcohol consumption from surveys underestimates true alcohol consumption as evidenced from sales (26,27) for three main reasons: the sampling frames leave out some of the highest consumers (such as institutionalized groups); the methodology of surveys cannot capture the full variety of drinking patterns; and there are response biases (28,29). However, despite these weaknesses, surveys can accurately describe trends and enable differences to be measured between groups of drinkers (such as in Fig. 6).

An earlier study by Baburin and colleagues (30) analyzed the age/period/cohort effects of alcohol consumption in Estonia using nationally representative survey data collected between 1996 and 2018 (Fig. 7). In this study, the total alcohol consumption among men peaked between the ages of 20 years and 29 years, after which daily amounts declined. Among women, alcohol consumption was also higher in younger age groups, but the age variation was more subtle.

**Fig. 7.**

Estimated mean daily alcohol consumption for males and females in Estonia according to age, period and cohort

- Males
- Females



Source: (30).

Period effects indicated that, for both men and women, average alcohol consumption increased significantly over the study period: from 11.5 g in 1996–1998 to 15.2 g in 2016–2018 for men, and for from 2.9 g to 4.3 g for women, respectively. However, cohort effects went in the opposite direction by sex. Among men, consumption was highest for those born in the 1960s and lower in subsequent cohorts, especially among those born in the 1990s and 2000s. For women, daily alcohol use was highest in the youngest cohort (born in 1990s and 2000s) compared with the other cohorts.

As reducing the consumption of alcohol by minors was one of the specific objectives of the *Green Paper*, data relating to this issue will be dealt with specifically in the evaluation section (Section 2.2.).

## 1.4. Aim and scope of the study

The *Green Paper* (11) defined the overall purpose of Estonian alcohol policy as reducing the social, economic and health damage caused by alcohol consumption, and ensuring a supportive and safe environment for all people. Its stated objectives were to:

- ▶ reduce the level of total alcohol consumption;
- ▶ reduce harmful consumption;
- ▶ prevent alcohol consumption by minors;
- ▶ ensure a safe environment and reduce alcohol-related crime, social problems and health damage; and
- ▶ develop treatment and rehabilitation services for motivated people with alcohol dependence.

Box 1 provides an overview of the main topics covered by the *Green Paper* (for details, see Annex 1 Table A1.1, and Annex 2 for a mapping of the areas of the *Green Paper* against the 10 areas of action of the WHO’s *Global Strategy to Reduce the Harmful Use of Alcohol* in (12)). The document contains adapted evidence-based suggestions from the WHO’s *Global Strategy to Reduce the Harmful Use of Alcohol* (12) and the priority areas from the *European Action Plan to Reduce the Harmful Use of Alcohol 2012–2020* (31). The compilation of evidence was localized using a multiple-stakeholder approach, and the resulting document has informed policy decisions in Estonia for over 10 years.

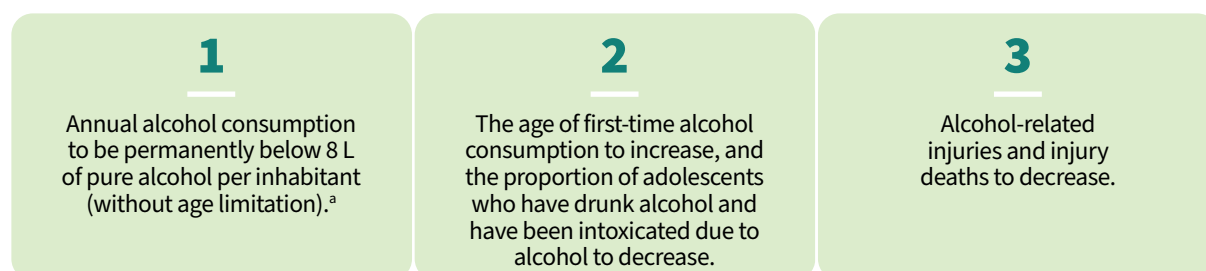
**Box 1.** Main topics covered by the *Green Paper*



Source: (11).

The *Green Paper* has played a central role in the development of Estonian alcohol policy but neither the specific indicators (see Box 2), nor the overall effectiveness and public health impact of the *Green Paper* and its resulting policies, have been systematically assessed.

**Box 2.** Indicators presented in the *Green Paper* to evaluate the attainment of alcohol policy objectives



<sup>a</sup> It is important to note that this indicator is not WHO's customary indicator, which measures population level of consumption in the adult population only (defined as 15 years and older).

Source: (11).

The evaluation of existing measures in terms of their appropriateness and effectiveness is also a prerequisite for further policy development to reduce the alcohol-attributable harms for society. Thus, the objectives of this evaluation are to:

- ▶ provide an analytical overview of the level of alcohol use and attributable harms from 2000 to 2022–2023,<sup>3</sup> and identify whether the period following the *Green Paper*'s adoption can be distinguished by lower levels of population consumption and attributable harm;
- ▶ specifically report on the indicators suggested within the framework of the *Green Paper*;
- ▶ evaluate the impact of select single policy measures implemented within the *Green Paper* framework, both regarding alcohol-attributable harms and from a wider societal perspective; and
- ▶ provide evidence-based and data-driven considerations for the improvement of alcohol control policies in Estonia.

As green papers are essentially strategy documents that outline the overall aims and direction for a certain policy area, the tasks and activities in green papers are indicative by nature, and generally do not include specific action plans. In addition, some of the recommendations posed in green papers can only be realized into policy action – and thus actual change in practice – by legislative acts. Therefore, the analysis in this evaluation focuses on Estonian alcohol policy action (defined by legislative changes and resulting activities) motivated either directly or indirectly by the *Green Paper*. A further consideration is the measurability of the outcome for these activities; based on the qualitative analysis of activities proposed by the *Green Paper*, only a limited set of activities (see Annex 1, Table A1.1) qualified for the analysis. Finally, activities proposed by the *Green Paper* are evaluated with respect to their impact on population health during 2013 and beyond. Thus, measures that may have high internal significance (for example, facilitating cooperation between different stakeholders related to mitigating alcohol-attributable harms), but that have a non-measurable direct impact on population health, remain beyond the scope of this evaluation.

Key metrics for the analysis are changes in excise tax, and the limitation of alcohol availability and advertising (that is, activities relating the so-called best buys of alcohol control policies) (32–34). For this, a search of all policy legislation for the Baltic countries and Poland was conducted as a first step (Estonia: (4); Latvia: (35); Lithuania: (36); and Poland: (37)). Alcohol control policies were then classified via nominal groups to identify the

3 This will depend on which indicator was available at the time at which this review was written.

policies with the highest population impact on consumption and mortality (37,38). Overall, increases in excise taxation of alcoholic beverages, and availability restrictions that reduced off-premises purchasing hours by more than 20%, were identified as having the most immediate effects. Table 3 shows the alcohol control measures in Estonia that were classified in this category.

**Table 3.** Potentially impactful single alcohol control policy interventions identified for Estonia (37)<sup>a</sup>

Date	Change in alcohol policy
1 January 2008	Excise tax increase of 10% for all alcoholic beverages
1 July 2008	Excise tax increase of 20% for all alcoholic beverages
14 July 2008	National ban on alcohol beverage sales between 22:00 and 10:00
1 January 2010	Excise tax increase of 10% for all alcoholic beverages
<b>1 February 2016</b>	<b>Excise tax increase of 15% for all alcoholic beverages</b>
<b>1 February–1 July 2017</b>	<b>Excise tax increase of 10% for all types of beverages in February, and additionally in July of 70% for beer and 45% for wines or fermented beverages with alcohol content ≤ 6%</b>
<b>1 February 2018</b>	<b>Excise tax increase of 5–20% for all alcoholic beverages</b>
<b>1 July 2019</b>	<b>Excise tax reduced by 25% for beer, wine or fermented beverages with alcohol content ≤ 6%, and strong alcohol</b>

<sup>a</sup> Measures enacted within the *Green Paper* period are in bold.

## 1.5. Analytical approach, data and methods

While lengthy discussions had taken place regarding alcohol control policies in Estonia before the final version of the *Green Paper* was released and policies outlined within it were implemented (39), the official start date for the policies put forward in the *Green Paper* was in early 2013, and the paper itself was only formally approved by the government in 2014 (11). Accordingly, this study distinguishes between the years prior to 2013 and those from 2013 onwards. A second breakpoint is set for the year 2020, due to the significant impacts of an excise tax reduction in July 2019 (see Table 3) and the onset of the COVID-19 pandemic on alcohol consumption and related harms (general: (18); see also below and (40,41)).

Furthermore, to describe trends, data between the years 2000 and 2023 are compared to that of neighbouring Baltic countries and Poland (when available) (see (42) for the underlying reasoning). In addition to broadly dividing the time period considered into years prior to 2013 and the years 2013 and after, the timing of the global economic recession that began in 2008 is also taken into consideration. In all Baltic countries, the 2008 global recession was associated with decreases in alcohol consumption (for trends since 2000, see (43)) and cigarette smoking (44), and consequently with an increase in life expectancy (see Fig. 13 below). Recession is defined as negative growth as measured as gross domestic product (45), and for Estonia it lasted from August 2008 to December 2009 (when modelling yearly data, the recession was modelled only for 2009).

Finally, the COVID-19 pandemic is considered, which had a dramatic negative impact on life expectancy in the Baltic countries, particularly in Lithuania (46). Increases in wholly alcohol-attributable deaths during the pandemic played an important role in this decrease (47). Both 2020 and 2021 are included in the yearly data for this period.

Overall, three distinct periods are identified:

- ▶ the years before 2013, i.e. before the implementation of the *Green Paper*;
- ▶ the core period following the *Green Paper*'s adoption (that is, 2013 until 2019);
- ▶ the time of the COVID-19 pandemic, during which the *Green Paper* was technically still relevant but had lost impact; the COVID-19 pandemic has also been shown to have had impacts on alcohol consumption (18,41,48–52) and harm (47).

The analytical components of this report include several key elements. First, the three periods are statistically compared to identify differences in alcohol indicators, based on the hypothesis that the implementation of the *Green Paper* would lead to a reduction in consumption and harm. It was also hypothesized that during the third period, these indicators would reverse due to the impacts of COVID-19 and the loosening of alcohol policies, such as the decrease in taxation in mid-2019. However, the analysis did not stop at assessing differences in indicator levels. Additionally, the possibility of a secular trend was examined by comparing differences between the three periods with respect to differenced values. Finally, to further substantiate causality, Estonian indicators were compared with those of neighboring countries, including Finland, Latvia, Lithuania, and Poland.

This procedure is adapted from the method of Shadish et al. (53), based on the original works of Cook, Campbell and Stanley (54–56). It applies mainly to yearly data, when the time-series being considered are too short for the application of proper time-series methodology (57,58).

Where monthly data are available, interrupted time-series analyses are conducted that offer more control, particularly if control series from other countries are available (57). Evaluation is based on diverse sets of data. For mortality and morbidity, comparative data collected within the Baltic Alcohol Control Project (42) are used, with updated mortality data for 2020–2022 for Estonia provided by the National Institute for Health Development. In addition, several open-source data sets from the Organisation for Economic Co-operation and Development, WHO, Statistics Estonia and the National Institute for Health Development are used for the analysis. The evaluation is complemented by document reviews and data extraction from relevant grey literature (for example, legislative acts, alcohol yearbooks, reports, etc.) and the specific measures of the *Green Paper* are mapped against the *WHO Global Strategy to reduce harmful alcohol use* (Annex 2). An expert survey was conducted to gain novel insights into the perceived effects of current alcohol policy in Estonia and its potential future directions (for methodology and the summary of findings, see Annex 3).

## 2. Results

A blurred image of a glass filled with a liquid, overlaid with a teal gradient. The glass is the central focus, with the liquid inside appearing as a soft, out-of-focus shape. The background is also blurred, creating a sense of depth. The teal gradient is applied across the entire image, with a darker shade on the left side and a lighter shade on the right side.

## 2.1. Impacts on the level of alcohol consumption

### 2.1.1. APC

#### Summary

The core period following the adoption of the *Green Paper* (2013–2019) was associated with a decrease in APC, both in comparison with the period before its adoption (2000–2012), and when compared with Latvia or Poland. Consumption started to increase again starting in 2019 after a tax decrease mid-2019 and with the onset of the COVID-19 pandemic.

While the core period following the adoption of the *Green Paper* (2013–2019) was associated with a decrease in APC, the target level of 8 L per capita was never reached.

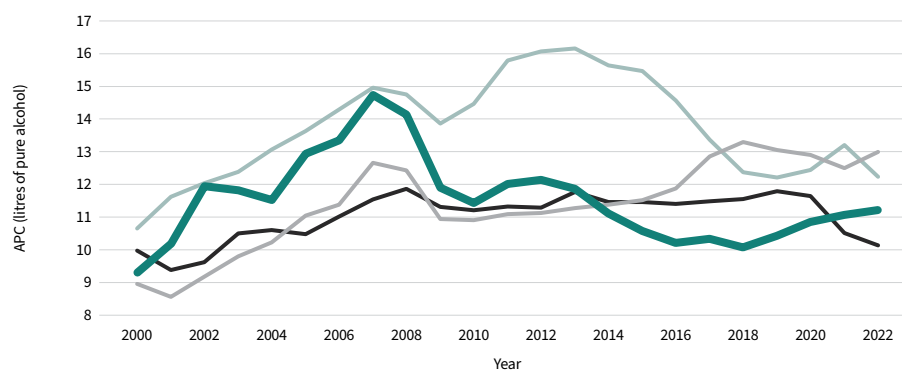
Most alcohol policies are designed to affect levels of alcohol consumption and patterns of drinking. The best measure for the level of consumption is APC, which denotes the average alcohol consumption for people aged 15 years and older in a population, expressed as litres of pure alcohol (ethanol; (59)). This is also the indicator used for measuring progress on alcohol control policy in international treaties, such as the United Nations' Sustainable Development Goals (60) (SDG 3.5.2) or the *NCD Global Monitoring Framework* (61).

Various sources were used to assess trends in APC consumption. Alcohol sales data from the Estonian Institute of Economic Research (62) and the Centre for Disease Prevention and Control in Latvia (63) were used to assess recorded consumption in these countries. These sales data were closely matched with WHO's data for recorded alcohol sales. Unrecorded consumption was based on WHO data (64), with the proportion assumed to be constant over the last three years. For Lithuania, data on recorded APC without excluding tourist/duty-free consumption since 2010 was used from Statistics Lithuania (65) for methodological consistency. Unrecorded alcohol was indirectly estimated (see (66) for general considerations), and values for 2019 onwards are based on new estimates of Štelemėkas and colleagues (67). For Poland, official APC data were provided by Statistics Poland and published by the National Centre for Prevention of Addictions (68), including recorded consumption data for wine, beer, spirits and total per capita consumption. The official government estimates for Poland are identical to WHO estimates (64,69). For the years 2021 and 2022, the proportion between recorded consumption and total consumption was assumed to remain consistent with the year 2020.

When examining the APC trends since 2000 (see Fig. 8) – in the three different time periods: prior to the *Green Paper* (excluding the recession, which was associated with a marked drop in alcohol consumption in all Baltic countries), after the *Green Paper* was published, and during–following the COVID-19 pandemic – a number of yearly changes emerge (as summarized in Table 4).

**Fig. 8.**  
APC of pure alcohol in the three Baltic countries and Poland between 2000 and 2022

■ Estonia  
■ Poland  
■ Lithuania  
■ Latvia



Source: (62–69).

**Table 4.** Mean change in adult APC from the previous year

Time period	Raw APC, <sup>a</sup> mean (SD)	Difference in APC from previous year, <sup>a</sup> mean (SD)	Difference in APC from previous year (%), mean (SD)
Before the <i>Green Paper</i> was finalized (2001–2012, excluding 2009)	12.39 (1.33)	0.47 (0.84)	4.4 (7.4)
After the <i>Green Paper</i> was finalized (2013–2019)	10.63 (0.64)	-0.25 (0.39)	-2.1 (3.5)
COVID-19 period (2020–2022)	11.02 (0.19)	0.27 (0.15)	2.5 (1.5)

Note: SD: standard deviation. / <sup>a</sup>In litres of pure alcohol.

Sources: (62–69).

The APC difference data (that is, the changes in APC from one year to the next) were used to remove autocorrelations between data points (57). Both the absolute and percentage differences from previous years were significantly lower during the period after the adoption of the *Green Paper* ( $F(1,18)=5.22$ ,  $P=0.035$ ;  $F(1,18)=5.02$ ;  $P=0.038$  respectively). In other words, in the time period between the adoption of the *Green Paper* and the beginning of the COVID-19 pandemic, alcohol consumption had substantially and significantly declined in Estonia. This can also be seen in the comparison with Latvia and Poland. However, based on a much higher level of APC in 2012, Lithuania showed greater decreases in APC over this period (see Fig. 8) (42,43). The marked decrease can be explained by the partial implementation of all three so-called best buys (32,70); for alcohol control policy (that is, increase of taxation, reduction in availability, and complete ban on marketing and advertisement).

Another way to quantify the impact of the *Green Paper* on alcohol consumption, is to use interrupted time-series analysis methodology to compare what would have happened without the implementation of the *Green Paper* in 2013, by continuing the secular trend with the actual trend. Predicted sales were calculated based on the generalized additive model (GAM) applied to the subset of data before 2013 (62) In the GAM, the overall alcohol consumption depends linearly on the smoothed spline function of years.

This can be seen in Fig. 9, which shows that adult alcohol per capita sales<sup>4</sup> had a downward trend until around 2018. After this year, per capita sales began to increase again.

<sup>4</sup> Please note that this indicator is based on alcohol per capita sales, where per capita was calculated using the adult population (those aged 15 years or older). This includes sales to tourists, and excludes consumption or purchases made by Estonians outside of Estonia. It also excludes purchases or home production of unregistered alcohol.

**Fig. 9.**  
Actual and predicted sales of alcoholic beverages in Estonia 2002–2022 in litres of pure alcohol per capita (15+ years old)



Source: (62).

While the *Green Paper* was clearly associated with a reduction in the level of consumption, and there are good reasons to assume causality (for criteria, see Section 1.4. above), the formal reduction target of 8 L per capita (not restricted to adults) was never reached. The lowest per capita consumption within the assessed observation period was 8.39 L in 2018 (71).

### 2.1.2. Indicators of alcohol consumption by minors

#### Summary

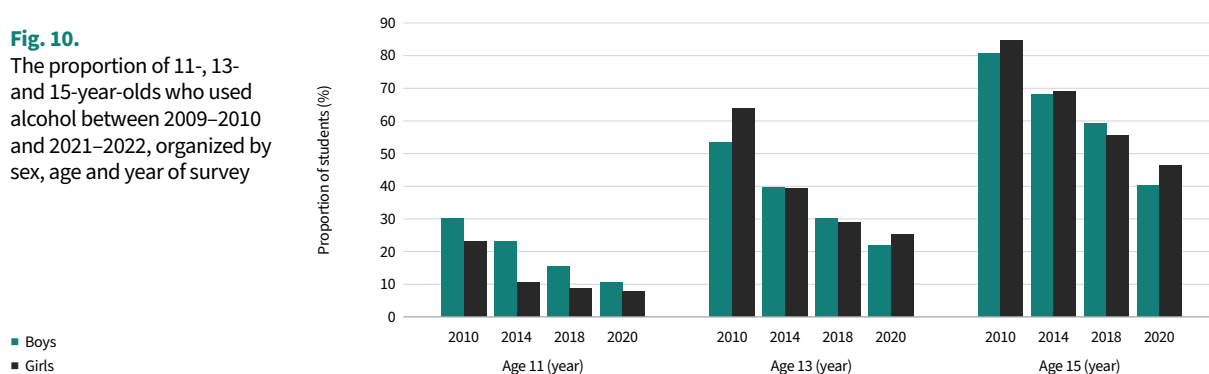
The period following the adoption of the *Green Paper* (2013–2019) was associated with decreases in intoxication of and alcohol use by minors, as well as an increase in the overall year of alcohol initiation. However, these trends could be found in most EU countries, so whether or not the *Green Paper* had a causal impact is not clear. In Estonia, these trends continued into 2022.

Alcohol consumption by minors has been a key indicator for the success of the *Green Paper*, which predicted that, after its implementation, the age of first-time alcohol use would increase, and the proportion of minors who used alcohol and had been intoxicated at least once in their lifetime would decrease (11).

Fig. 10 gives an overview of the percentages of 11-, 13- and 15-year olds who used alcohol – organized by sex, age and year of survey – based on the previous four above-described HBSC studies, (25). The data show two significant impacts on the prevalence of alcohol use (Table 5):

- ▶ the year in which the survey data were collected (2009–2010, 2013–2014, 2017–2018 and 2021–2022 show a continuously decreasing trend; and
- ▶ the age of the respondents (increasing trend with age).

**Fig. 10.** The proportion of 11-, 13- and 15-year-olds who used alcohol between 2009–2010 and 2021–2022, organized by sex, age and year of survey



Source: (25).

Sex had no significant impact. Respective to the baseline, alcohol use in the years after the implementation of the *Green Paper* was significantly lower than baseline (2009–2010).

A similar pattern can be seen for the number of lifetime events of intoxication, except that sex becomes significant: the prevalence of at least one lifetime intoxication event was greater for boys than for girls (Table 5).

**Table 5.** Changes in alcohol use indicators among minors in Estonia (2009–2010, 2021–2022); results from logistic regression analysis

Influencing factor	Alcohol use prevalence		Prevalence of lifetime intoxication	
	Odds ratio	95% CI	Odds ratio	95% CI
<b>Year of survey</b>				
2009–2010	1	Reference	1	Reference
2013–2014	0.48	0.44–0.54	0.44	0.39–0.49
2017–2018	0.31	0.28–0.34	0.34	0.31–0.38
2021–2022	0.22	0.20–0.24	0.29	0.26–0.32
<b>Age</b>	1.80	1.76–1.85	5.20	2.74–9.87
<b>Age squared</b>	Not significant: not included in final model		0.97	0.95–0.99
<b>Sex</b>				
Female	1	Reference	1	Reference
Male	1.03	0.96–1.10	1.12	1.03–1.21

Source: (25)

However, this pattern of results cannot be causally attributed to the *Green Paper*. First, as indicated above, this is a long-term trend (72, 73), which was not significantly altered over the period following the adoption of the *Green Paper*, and which continued into 2021–2022. Secondly, the same overall downward trends could be found in almost all EU countries, irrespective of alcohol control policies, albeit with some variations in the strengths of the trends (72, 73).

## 2.2. Impacts on alcohol availability

### Summary

The core period following the adoption of the *Green Paper* (2013–2019) was associated with an increase in the availability of alcohol due to a 40% increase in the number of registered sales points and no changes to the hours during which sales of alcohol are permitted. This precluded the country from further decreasing APC during this period.

Regulating the physical availability of alcohol has been identified as one of the so-called best buys of WHO to reduce alcohol-attributable harm (33,34). Babor and colleagues (74) highlight the following best practices to regulate physical availability:

- ▶ limiting hours and places of sale
- ▶ public welfare-oriented alcohol monopoly
- ▶ minimum purchase-age laws.

Estonia markedly restricted the physical availability of alcoholic beverages by limiting alcohol-purchasing hours nationally in 2008 by prohibiting off-premises sales between 22:00 and 10:00 (2), leading to reductions in APC and all-cause and 100% alcohol-attributable mortality (see (42) for an overview). In the *Green Paper* – published a few years later – the physical availability of alcohol was only minimally addressed.

Exceptions to this included a mention of a partial point-of-sale display ban (July 2019) and a toughening of penalties for those making alcohol available to minors (see Annex 1, Table A1.1). Amendments to the Alcohol Act imposed a partial point-of-sale display ban, stating that alcoholic beverages should not be visible from outside the sale premises. Within the sales premises, alcoholic beverages must be placed separately from other goods and should not be visible from the rest of the sales premises area (75).

An earlier evaluation on the effectiveness of this display ban (76) found that, 2.5 months after the implementation of visibility restrictions, 39% of retail stores included in the survey sample had reorganized their alcohol sale areas, with on average 15% decreases in alcohol display areas and visibility. According to these results, the visibility restrictions also reduced the amount of time purchasers spent looking at alcoholic beverages and thereby reduced the number of impulse purchases.

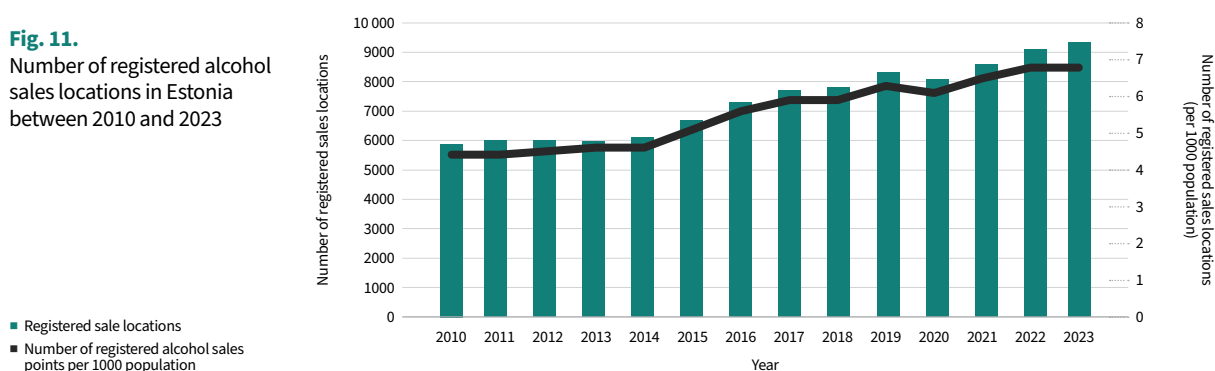
Results from previous mystery shopping studies (77) indicated that personal identification is asked for in less than one half of purchase transactions. Identification was requested in 45% of retail store alcohol test purchase transactions in 2016, compared with 35% in 2012. Since 2016, the rate of identification requesting has remained more or less unchanged (44% in 2019 and 49% in 2022), suggesting that it is still very easy for minors to obtain alcohol in Estonia.

Although the onset of the COVID-19 pandemic resulted in temporary restrictions on the hours of on-site alcohol sales (with no sales permitted between 22:00 and 10:00 during March–May 2020, and between 00:00 and 10:00 during the period October 2020 to January 2021) (4), the hours during which alcoholic beverages can be sold did not change during this period.

Otherwise, there have been no legislative changes to limit the supply of alcohol. In contrast, with the exception of 2020, the number of registered alcohol sales locations has increased constantly since 2014 (+56%; with a 40% increase during the core period of 2013–2019) (see Fig. 11). However, there are certain difficulties in assessing these trends as based on data from the governmental Register of Economic Activities (69). Although alcohol sales locations as such are registered by this entity, the registry does not actively monitor their actual economic activity. Thus, it is possible that retail or catering establishments that are not operating are still present in the registry, which could lead to overestimation (78).

As of 2023, there are on average 6.8 alcohol sales points per 1000 inhabitants in Estonia, a considerable increase compared with the average of 4.5 alcohol sales points in 2010–2014. Also, the spatial density of alcohol sales locations has increased from 1.4 per 10 km<sup>2</sup> in 2014 to 2.1 locations per 10 km<sup>2</sup> in 2023. This trend is similar for both alcohol retail sales points and catering establishments (bars, cafes, restaurants etc.).

**Fig. 11.**  
Number of registered alcohol sales locations in Estonia between 2010 and 2023



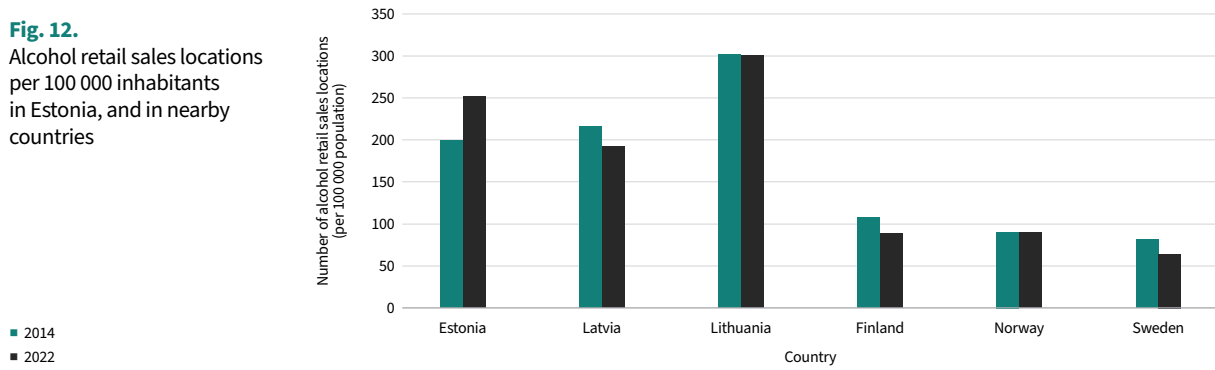
Source: (71,79).

The physical availability of alcohol in Estonia is in stark contrast to the Nordic countries (Fig. 12), where the number of alcohol retail stores have declined between 2014 and 2022. The nearly fourfold difference in alcohol retail sales locations per 100 000 inhabitants compared with Sweden and threefold difference with Finland and Norway is due to different market regulations in Nordic countries under retail monopolies (74). Estonia is, however, also the only Baltic country in which the number of alcohol retail stores has increased since 2018.

Based on population survey data reported in annual alcohol yearbooks (71,79), on average 86.1% of respondents in 2000–2023 stated that their closest alcohol point of sale was located in their dwelling-house or in the neighbouring building. Thus, while some of the sales points were established to facilitate cross-border shopping (13), the impact is clearly measurable for all Estonians (for detailed numbers, see Annex 1, Table A1.2).

In summary, the scale of the physical availability of alcohol is highly problematic for enacting meaningful alcohol policy in Estonia, especially since its availability has been linked to heavy episodic drinking and attributable consequences such as cardiovascular disease, injury and violence ((74); for a demonstration in a Baltic country, see (80)).

**Fig. 12.** Alcohol retail sales locations per 100 000 inhabitants in Estonia, and in nearby countries



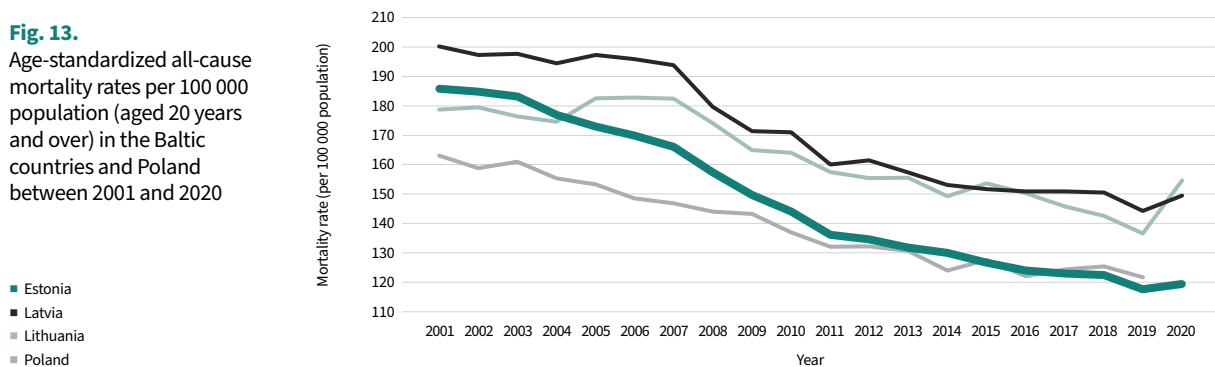
Source: (71,79,81,82).

## 2.3. Impacts on mortality and life expectancy

### 2.3.1. All-cause mortality and life expectancy

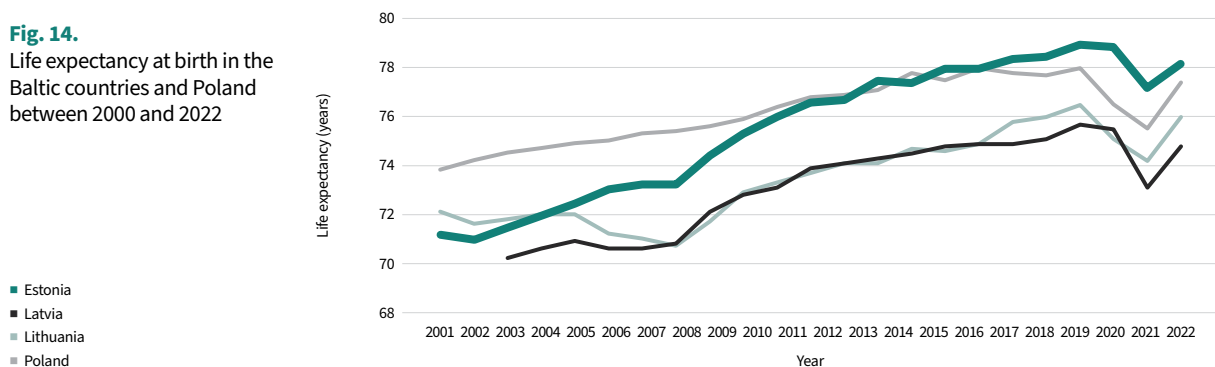
Age-standardized all-cause mortality rates (Fig. 13) and life expectancy at birth (Fig. 14), the two main indicators of health during the two decades being evaluated, showed steady decreases and increases, respectively, until the onset of the COVID-19 pandemic.

**Fig. 13.** Age-standardized all-cause mortality rates per 100 000 population (aged 20 years and over) in the Baltic countries and Poland between 2001 and 2020



Source: (83).

**Fig. 14.** Life expectancy at birth in the Baltic countries and Poland between 2000 and 2022



Source: (83).

This visual impression was complemented by statistical analyses, which revealed no significant trend in the slope of all-cause mortality during the period between 1 January 2013 and 31 December 2020 in Estonia (tested again over differenced data;  $F(1,18) < 1$  for females, males and total,  $P =$  not significant). Details on age-standardized mortality by sex for all four countries can be found in Annex 1, Fig. A1.2 (females) and Annex 1, Fig. A1.2 (males). The age-standardized mortality rates for Estonia underlying the statistical test can be found in Annex 1, Fig. A1.3. For statistical analyses within Estonia, the data were age-standardized against the Estonian population in 2020 (84).

To date,<sup>5</sup> Estonia has had the highest life expectancy at birth of the Baltic countries and Poland ((83); see Fig. 13). However, there were substantial decreases in all four countries during the COVID-19 pandemic, particularly during 2021 in Estonia, a time during which many other countries in the EU saw increases in life expectancy (85,86). In 2022, based on preliminary data, all four countries began to show increases in life expectancy (83).

Regarding life expectancy in Estonia, it must be noted that the difference between females and males is much higher than the EU average (83). This phenomenon is true for all three Baltic countries and Poland; in 2017, when a special examination of sex differences in life expectancy in the EU was undertaken, these four countries had the highest gender gaps of all countries in the EU (87). This gap has been shown to be impacted by the level of alcohol consumption and drinking patterns (88–90). For instance, Trias-Llimos and Janssen estimated that, in 2012, the gap would have been 1.8 years (95% CI: 1.2–2.3 years) smaller if the impact of alcohol consumption was excluded (88).

### 2.3.2. Alcohol-attributable injuries and fatalities following injury: measuring a formal indicator of the *Green Paper*

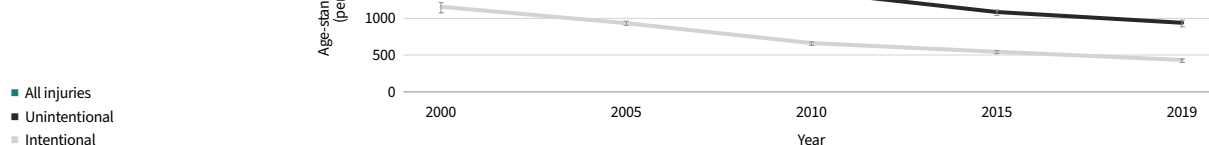
#### Summary

The core period following the adoption of the *Green Paper* (2013–2019) was not associated with any significant decrease in injuries or injury-attributable fatality indicators over and above the secular trends. Thus, while both the rates of age-standardized mortality and DALYs lost decreased substantially during these periods, these changes were not more pronounced than the respective changes in the years before the adoption of the *Green Paper*.

Alcohol-attributable injuries is one of the indicators by which the success of the *Green Paper* was to be measured. It is clear that the age-standardized rates of injuries have decreased since the year 2000, both in terms of fatalities and DALYs lost, the latter including the non-fatal proportion (Fig. 15 and Fig. 16; (18)). However, while alcohol-attributable injury indicators were lower during the core period following the adoption of the *Green Paper*, this could be part of a secular trend, which was especially evident between 2005 and 2010. Thus, the contribution of the *Green Paper* to these trends cannot be clearly delineated.

<sup>5</sup> As of March 2024, 2022 is the latest year available with comparable data.

**Fig. 15.**  
Age-standardized disease burden due to injuries (DALYs lost per 100 000 population and 95% CIs) in Estonia between 2000 and 2019



Source: (91).

**Fig. 16.**  
Age-standardized mortality due to injury per 100 000 population (and 95% CIs) in Estonia between 2000 and 2019



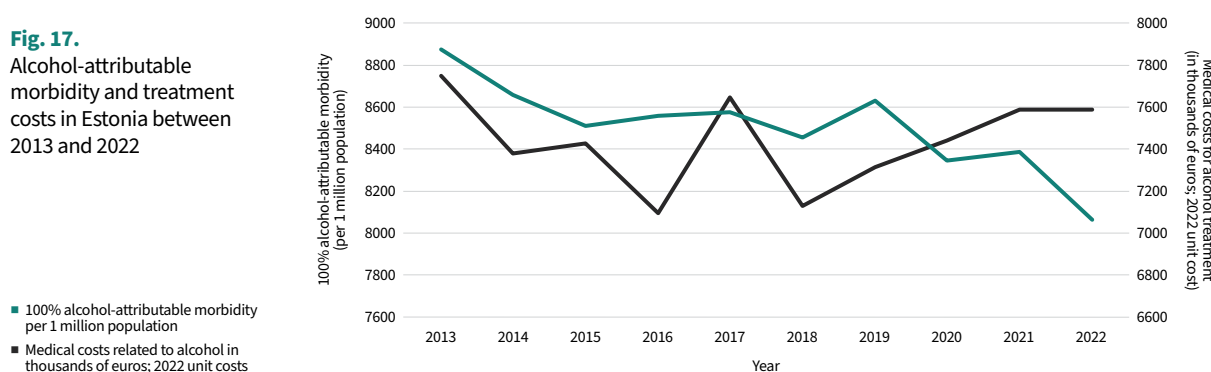
Source: (91).

The main impact on these trends seems to be a general decline in injury-attributable fatalities and DALYs lost, over and above the overall decline in mortality and DALYs lost. There was a significant decline in the number of injury-attributable fatalities and DALYs lost in Estonia even when compared to Lithuania, another Baltic country with declining injury indicators (91).

## 2.4. Alcohol-attributable morbidity, treatment and costs in Estonia

Although alcohol consumption contributes to the etiology of more than 200 diseases (92), alcohol-attributable morbidity data are often only provided for a limited number of diagnoses. Based on comparative morbidity data for 2013–2022 (93,94), Fig. 17 demonstrates the trends for morbidity and treatment costs from 2013 to 2022. Except for a slight downward trend in both morbidity and treatment costs in the years immediately following 2013, the alcohol-attributable morbidity burden and associated treatment costs remained stable until 2019. The divergence from this trend between 2020 and 2022 can be explained by the COVID-19 pandemic, which affected the availability of medical services.

**Fig. 17.**  
Alcohol-attributable morbidity and treatment costs in Estonia between 2013 and 2022



Source: (93,94).

The overall distribution of diagnoses (see Annex 1, Fig. A1.5) remained relatively stable between 2013 and 2022, with diagnoses of alcohol psychosis ((95)(International Classification of Disease, tenth revision (ICD-10) F10.0, 10.3–10.9)), alcohol dependence (ICD-10 F10.1) and alcoholic liver disease (ICD-10 K70-K70.99) accounting for nearly two thirds of incident cases over this period. However, when comparing 2013 and 2022 data, it is apparent that the proportion of total alcohol-attributable diagnoses due to alcoholic liver disease increased from 10% to 14%. Alcoholic liver disease also has one of the highest treatment costs of the diagnoses considered, with average costs per patient of 2611 euros and total health-care costs for treatment of 1373 patients exceeding 3.5 million euros in 2022. On average, 9935 patients were diagnosed with 100% alcohol-attributable diseases per year,<sup>6</sup> with a mean annual treatment cost of 8.4 million euros (in 2022 values).

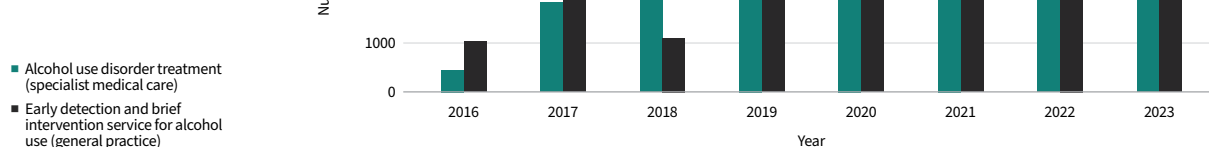
However, a recent cost-of-illness analysis (96) estimated that direct health care costs (without including costs associated with family physicians) relating to the use of alcohol in Estonia amounted to 50.5 million euros (28.9 million euros for males and 21.6 million euros for females) in 2022. It must be noted that this direct health care cost-based estimate would still underestimate the broader societal costs of alcohol use, even if it also included indirect health-care costs. A systematic review and meta-analysis (97) of 29 cost-of-illness studies published since the year 2000 found that the average cost of alcohol use per adult was 817.6 international dollars (95% CI: 601.8–1033.4, in 2019 values). If this were to be extrapolated to the Estonian adult population, the societal costs of alcohol could be within the range of 0.64–1.11 billion international dollars.

The *Green Paper* highlighted the lack of a unified treatment approach for alcohol use disorder in Estonia and that the development of clinical guidelines and two prevention and treatment services were started in 2014. In late 2015, the guidelines were published (98,99) and provided support for the implementation of an early detection and brief intervention service, and an alcohol use disorder treatment service. The first was provided by general practitioners to their patients as part of general health-care provision and included the Alcohol Use Disorders Identification Test (100) as the primary screening instrument. Depending on the outcome, patients were provided with brief counselling or referred for alcohol use disorder treatment, forming an integrated treatment system. The service provision in the pilot phase started in July 2024<sup>7</sup> in a limited number of general practices (11 sites in 2017) and hospitals. Between 2017 and 2023, on average 3660 patients per year were involved with the early detection service and 2660 patients received alcohol use disorder treatment (Fig. 18).

6 Diagnoses in the ICD-10 covered are: Alcohol psychosis (F10.0, 10.3-10.9), Harmful use of alcohol (F10.1), Alcohol dependence (F10.2), Mental and behavioral disorder due to use of alcohol (F10)\*, Degeneration of nervous system due to alcohol (G31.2), Alcoholic polyneuropathy (G62.1), Alcoholic myopathy (G72.1), Alcoholic cardiomyopathy (I42.6), Alcoholic gastritis (K29.2), Alcoholic liver disease (K70-K70.99), Alcohol-induced chronic pancreatitis (K86.0), Fetal alcohol syndrome (Q86.0), Toxic effect of alcohol (T51-T51.99), and Accidental poisoning by and exposure to alcohol (X45).

7 Funded in 2015–2023 by the European Social Fund under the prevention programme “Sober and Healthier Estonia”.

**Fig. 18.**  
Number of individuals receiving alcohol-related brief interventions and treatment in Estonia between 2016 and 2023



Source: (101).

According to an earlier study evaluating the early detection and brief intervention service (101), a total of 13 693 screenings of 13 021 individual patients were performed from July 2016 to September 2020 by 31 service providers. Brief interventions were provided on 1927 occasions (14 per 100 screenings on average) and repeat testing was conducted on 327 occasions (17 per 100 brief interventions). It must be noted that service provision was limited, and that the selection of patients for screening and the follow-up approaches employed varied considerably across the centres.

However, both services marked a considerable improvement in the prevention and treatment of alcohol problems in Estonia, as only rehabilitation services via psychiatrists had been available before their introduction. Since 2023, these services have been coordinated and funded by the Estonian Health Insurance Fund. Thus, the core period after the adoption of the *Green Paper* has contributed substantially to the development of programmes focusing on the early detection and treatment of alcohol use disorder in Estonia.

## 2.5. Social harm associated with alcohol use

### 2.5.1 Traffic indicators

#### Summary

The core period after the adoption of the *Green Paper* (2013–2019) was significantly associated with decreases in AAFs (that is, the proportion of outcomes that were caused by alcohol use, for traffic accidents and traffic injury, but not for traffic fatalities). AAFs in the latter subcategory declined as well, but not enough events were recorded, and there was high variability between years, so a much larger sample would have been necessary to determine significant differences. During the COVID-19 pandemic AAFs increased.

Alcohol use has been shown to not only to impact on the health of the drinker, but also the health of others, as well as impacting social indicators (74). Traffic indicators provide a good example to demonstrate these associations: alcohol use may harm the drinker after he–she has driven under the influence; it may also harm innocent bystanders, even if they had never drunk a drop of alcohol in their lives. It can also affect other indicators,

such as the damage caused to the vehicle. Three indicators were tested for association with the core period after the adoption of the *Green Paper*:

- ▶ the number of people involved in traffic accidents,<sup>8</sup>
- ▶ the number of people harmed in such an event (non-fatal traffic injury),
- ▶ the number of traffic fatalities.

All three indicators were based on police records, collected by the Estonian Transport Administration (102) and prepared for the National Institute for Health Development (103), for the years 2010–2023. For all three indicators, the overall numbers, as well as the numbers attributable to the influence of alcohol, were available and the alcohol-attributable numbers were divided by the overall numbers to calculate the AAFs (102,104).

As for the other indicators noted above, three time periods were distinguished (before the *Green Paper*: 2010–2012; the core period after the *Green Paper*: 2013–2019; the COVID-19 pandemic period: 2020–2023). The decision was made to model the associations in this manner because previous research in Lithuania showed that alcohol control policies that were not specific to traffic participation under the influence of alcohol could have an effect on traffic indicators as well, as long as traffic was part of the overall, larger strategy (105). Table 5 gives an overview of the results.

**Table 5.** AAFs of the number of people involved in traffic accidents, traffic injury and traffic fatalities

Indicator	Sex	Mean (SD)			ANOVA		Tukey HSD contrasts			
		Period 1: 2010–2012	Period 2: 2013–2019	Period 3: 2020–2022	F-value	P-value	Contrast: Period 1 vs Period 2		Contrast: Period 2 vs Period 3	
		Estimate	P-value	Estimate	P-value					
AAF of number of people involved (%)	Females	0.09 (0.01)	0.07 (0.01)	0.08 (0.01)	5.76	0.0216	0.02	0.0178	-0.01	0.3768
	Males	0.18 (0.01)	0.15 (0.02)	0.17 (0.0048)	7.87	0.0089	0.03	0.0127	-0.03	0.0527
	Both	0.15 (0.01)	0.12 (0.01)	0.14 (0.0046)	9.92	0.0042	0.03	0.0048	-0.02	0.0538
AAF of traffic fatalities (%)	Females	0.15 (0.06)	0.15 (0.06)	0.16 (0.05)	0.06	0.9394	0.00	0.9993	-0.01	0.9361
	Males	0.30 (0.07)	0.29 (0.14)	0.38 (0.15)	0.48	0.6329	0.00	0.9984	-0.08	0.6237
	Both	0.26 (0.03)	0.24 (0.08)	0.31 (0.1)	0.84	0.4616	0.01	0.9721	-0.07	0.4358
AAF of traffic injury (%)	Females	0.09 (0.01)	0.07 (0.01)	0.08 (0.02)	4.57	0.0389	0.02	0.0336	-0.01	0.3965
	Males	0.24 (0.01)	0.20 (0.02)	0.23 (0.01)	6.42	0.0161	0.04	0.0219	-0.03	0.0834
	Both	0.18 (0.01)	0.14 (0.01)	0.17 (0.01)	9.89	0.0043	0.04	0.0054	-0.03	0.0423

Note: ANOVA: analysis of variance; HSD: honest significant difference; SD: standard deviation; vs: versus.

For all indicators, AAFs were lower in the time period 2013–2019. However, this was not significant for traffic fatalities due to the high variability of this indicator: the number of alcohol-attributable traffic fatalities varied between 8 and 27, and all traffic fatalities between 48 and 91; the AAF varied between 15% and 41%.

<sup>8</sup> While the term “accident” is used as it is customarily used by police and the general population, alcohol-attributable traffic collisions, injury and fatalities are not accidental, as they do not happen purely by chance, but rather as a consequence of behaviours that risk the health or life of not only the driver who has consumed alcohol, but also of others, regardless of whether they themselves have consumed alcohol.

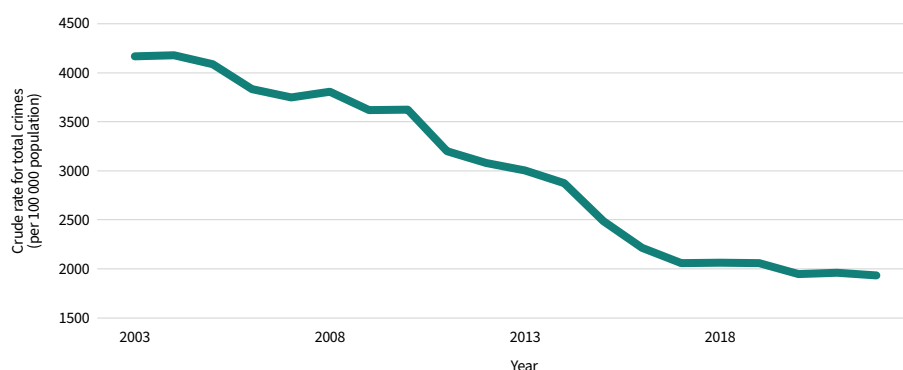
## 2.5.2 Crime indicators

### Summary

The core period after the adoption of the *Green Paper* (2013–2019) was generally associated with a decrease in crime, including severe crime. Crime continued to decrease during the COVID-19 pandemic. Not many offences were formally determined to be alcohol-related (< 150 in any year), but these were more frequent in the period 2013–2019.

As indicated above, alcohol use does not only have impacts on health, but also on wider social indicators such as crime (74,97). Three indicators for crime were examined for their association with the period after the *Green Paper's* adoption: all crimes; severe crimes composed of manslaughter (Penal Code §113), murder (§114), causing serious health damage (§118) and rape (§141); and motor vehicle-associated crimes. In Fig. 19, only the crude rate of all crimes is displayed (106).

**Fig. 19.** Crude rate of total crimes per 100 000 population in Estonia between 2003 and 2018



Source: (74,97).

All three categories for crime showed marked decreases for the period between 2013 and 2019, before flattening out in the years after 2020 (see Table 6). However, a secular trend cannot be ruled out as an explanation for the difference between the periods 2003–2012 and 2013–2019.

**Table 6.** Crime indicators and their association with the three periods considered around the Green Paper's adoption (2003–2022)

Indicator	Mean (SD)			ANOVA		Tukey HSD contrasts			
	Period 1: 2003–2012	Period 2: 2013–2019	Period 3: 2019–2022	F-value	P-value	Contrast: Period 1 vs Period 2		Contrast: Period 2 vs Period 3	
						Estimate	P-value	Estimate	P-value
Total crimes	50 344 (5636)	<b>3148 (5342)</b>	25 821 (160)	40.55	0.0000	18.86	0.0000	5.66	0.280
Severe crimes	424 (154)	<b>301 (25)</b>	268 (27)	3.57	0.0508	124	0.0968	32	0.907
Motor vehicle crimes	3578 (677)	<b>2954 (333)</b>	2540 (209)	5.50	0.0144	624	0.0739	414	0.516
Alcohol-related offences	66 (18)	<b>100 (23)</b>	76 (5)	4.85	0.027	-32.5	0.024	23.9	0.211

Note: ANOVA: analysis of variance; HSD: honest significant difference; SD, standard deviation; vs: versus.

The Ministry of Justice also measures alcohol-related offences (107), but these are relatively small numbers, fluctuating between 46 and 149 offences per year. However, an analysis of variance did show significant differences between the three time periods (2007–2012, 2013–2019 and 2020–2022), with the highest number of offences occurring in the core period after the *Green Paper* 's adoption (significantly higher than the period before).

## 2.6. Statistical evaluation of single policy measures in Estonia: taxation

### 2.6.1. Level of alcohol consumption

It has already been noted that the overall level of alcohol consumption declined during the core period covered by the policies identified in the *Green Paper*, which was operationalized to start in 2013 and ended with the beginning of the COVID-19 pandemic in 2020. This can be interpreted as an overall effect of the combined interventions, with some degree of denormalization of alcohol use for the whole population associated with it (for the concept of normalization, see (108,109)). Given the number of interventions, it is difficult to separate the individual effects of smaller interventions but, of course, the effects of the most impactful interventions can be examined. As noted above, these include the increases in alcohol excise taxation that were large enough to reduce the affordability of alcohol in the year after the taxation increase (37).

The other two Baltic countries, Latvia and Lithuania, as well as Poland, were used as control countries. Taxation increases, which reduced affordability, and availability restrictions of at least a 20% reduction in purchasing hours were associated with an average APC decrease of 0.83 L of pure alcohol (95% CI: -1.32 to -0.47) in the same year when the alcohol control policies were implemented, with no significant differences seen on the basis of when or where the interventions were implemented (43). This means that the taxation increases in 2016, 2017 and 2018 in Estonia, which were implemented as a result of the *Green Paper*, contributed markedly to the overall lower level of alcohol consumption during this period.

### 2.6.2. Mortality indicators

The same interventions were examined for their impacts on all-cause and 100% alcohol-attributable mortality via interrupted time-series analyses that compared the effect of the intervention in one country against the trends in the other three abovementioned countries during the same time period, which served as controls (see (42) for further details; see (53) for design considerations; see (57,58) for time-series methodology).

The results of this analysis of the effects of all 18 taxation and availability changes between 2000 and 2020 in the four countries on all-cause mortality showed that, on average, these measures resulted in a reduction of male age-standardized all-cause mortality rates of 2.3% (95% CI: 0.7–3.9%;  $P=0.0045$ ) for the year after implementation, and for females a reduction of 1.1% (95% CI: -0.02 to 2.2%;  $P=0.0554$ ) per year, which was not statistically significant (81). Importantly, the 18 alcohol control measures comprised all taxation increases that had resulted in a reduction in affordability, as well as all reductions in trading times at off-premises facilities that were greater than 20%.

Analyzing the impact on 100% alcohol-attributable mortality, alcohol control policies were found to significantly reduce male alcohol-attributable mortality by 7.6% (95% CI: 3.7–11.3%;  $P < 0.001$ ) in the 12 months after policy implementation. For females, the alcohol control policy mean-shift effect was greater, resulting in alcohol-attributable mortality being significantly reduced by 10.8% (95% CI: 5.7–15.6%;  $P < 0.001$ ) in the 12 months after policy implementation (110). These effects correspond with 43 avoided alcohol-attributable deaths (29 among males and 14 among females) in the year after implementation of meaningful policy change. Again, the interaction effects of countries and the policy tested in the full model were not statistically significant, which indicated that the impact of alcohol control policies on alcohol-attributable mortality did not differ across countries for either males and females.

In summary, it is clear that the taxation measures implemented as a result of the recommendations of the *Green Paper* contributed to the continuing decline of all-cause and 100% alcohol-attributable mortality in Estonia until July 2019, when alcohol excise tax was decreased by 25%, and in 2020 when the COVID-19 pandemic began. Both of these events were crucial in changing alcohol consumption and alcohol-attributable harm (see below).

### 2.6.3. Changes in excise taxes for alcohol and cross-border trade

The rapid increases in alcohol excise tax in Estonia on six occasions between the years 2015 and 2018 resulted in substantial price differences with neighbouring Latvia. After a 15% increase in taxation on all alcohol from January 2015 in Estonia, the excise duty rates between the two countries differed by 30–90%, depending on the type of beverage. Consequently, cross-border trade intensified, with the first alcohol wholesale shops opening at the border in the autumn of 2015. Following excise increases in 2016, 2017 (on two occasions) and in 2018, the retail prices for both beer and strong alcohol differed by nearly 40% between Estonia and Latvia in 2018. Data from population surveys indicate that in 2016, 21% of adult respondents had bought alcohol from Latvia and 7% had travelled specifically to purchase alcohol; by 2018, these estimates had increased to 35% and 14%, respectively (111,112).

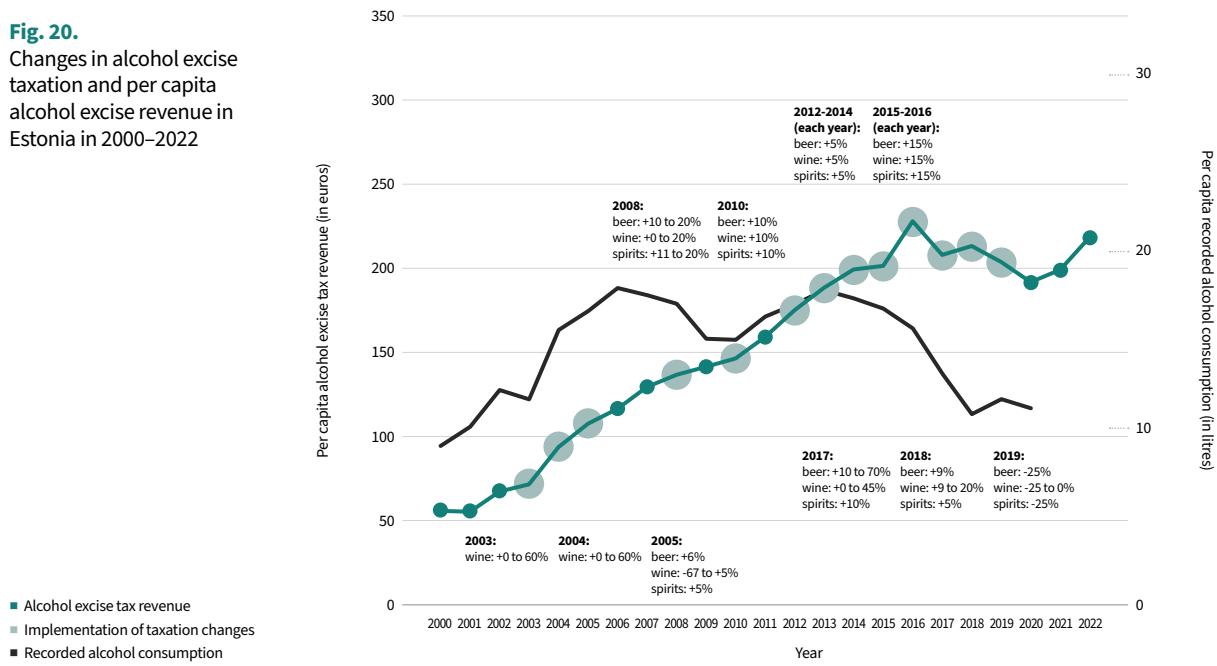
To limit the cross-border alcohol trade, the tax increases planned for 2019 and 2020 were cancelled in late 2018, followed by the reversal of previous excise increases on 1 June 2019 when excise rates were reduced by 25% for beer, wines or fermented beverages, and strong alcohol. The immediate change in alcohol retail prices was marginal (below 5%), but considering the 7.7% increase in the average Estonian net salary during the period, alcoholic beverages became significantly more affordable for consumers.

The cross-border alcohol trade started to decline in late 2019 and was brought to an abrupt end by the onset of COVID-19 pandemic in early 2020 (4).

### 2.6.4. Tax revenues

Changes in alcohol excise taxation do not only impact the level of alcohol consumption and health (see above), but are also linked to revenues (113). While this is disputed by the alcohol industry, well-implemented taxation increases have been shown to be regularly associated with increases in revenue (113). This was the case with the taxation increases during the core period after the adoption of the *Green Paper* in Estonia, as shown by Manthey and colleagues ((114); see Fig. 20).

**Fig. 20.**  
Changes in alcohol excise  
taxation and per capita  
alcohol excise revenue in  
Estonia in 2000–2022



Source: (114).

## 2.7. Public perception of and expert opinion on alcohol control policies and the impact of the Green Paper

### 2.7.1. Public perception

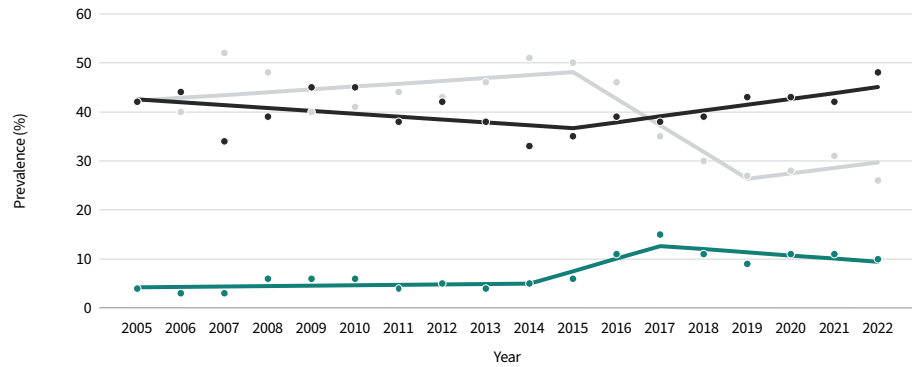
Individual attitudes and public opinion are often against the implementation of alcohol control policies. Annual data from population polls on alcohol policies (71,93) provide valuable insight on the perceived significance of alcohol harms and alcohol policies in society. In the data for 2022 (71), drink-driving, domestic violence, alcohol-attributable crimes, health issues and family problems were all considered to be serious or very serious problems by over 80% of respondents. This pattern remained fairly consistent over the time period under study.

The indirect effects of the *Green Paper* and subsequent policies can be found in public attitudes towards alcohol control policy. While on average 45% of respondents in the 2004–2013 surveys supported strict alcohol control measures, the results of a Joinpoint regression analysis<sup>9</sup> (Fig. 21) indicate a clear decline in support for strict regulations (i.e., a preference for either regulated or liberal policy) from 2014 to 2018. Although these results can also be interpreted as increasing public opposition to more consistent alcohol control policies following the *Green Paper*, they also signify the impact the *Green Paper* had on alcohol policy. This period effect was also present in time trends of attitudes towards individual policy measures (Annex 1, Fig. A1.6).

9 Joinpoint analyses aim to find time points, when secular trends change in a statistically significant way.

**Fig. 21.** Joinpoint analysis: public preference for strict versus restricted or liberal alcohol control policies between 2004 and 2022

- Liberal policy (observed)
- Liberal policy (modeled value)
- Restricted policy (observed)
- Restricted policy (modeled value)
- Strict policy (observed)
- Strict policy (modeled value)



**Liberal policy:** 2004–2015 APC=-0.46; 2015–2018 APC=26.25; 2018–2022 APC=-10.80;  
**Restricted policy:** 2004–2014 APC=-1.49; 2014–2022 APC=3.10;  
**Strict policy:** 2004–2015 APC=1.44; 2015–2018 APC=-13.73; 2018–2022 APC=3.12.

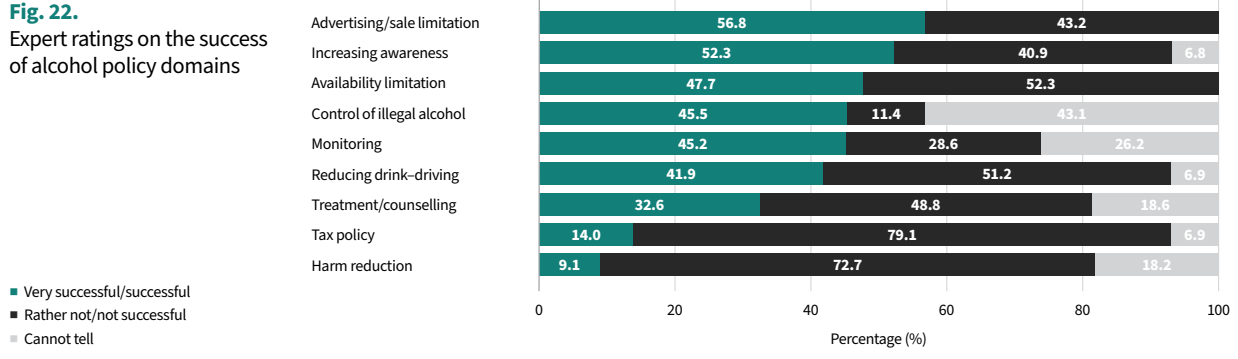
Source: (115).

Both men and women with alcohol consumption levels considered to be high risk were significantly more likely to be against alcohol control measures in general, even after accounting for variations by demographic characteristics in Estonia (115). This is to be expected, as alcohol control measures would affect this population group the most. Given that every sixth person aged 15 years or older in Estonia reports a high level of alcohol consumption, defined as  $\geq 14$  standard drinks for men per week and  $\geq 7$  for women, the importance of communicating alcohol-attributable harms to the public cannot be underestimated as a policy goal. Moreover, greater public awareness can potentially lead to increased support for alcohol control policies in the long run.

## 2.7.2. Experts' perspectives

Following the topic areas and activities listed in the *Green Paper*, the Estonian alcohol expert survey (see Annex 3 for survey methodology and detailed results) provided another perspective with which to evaluate the outcomes of alcohol policy. Reducing drink-driving and limiting advertising or sale promotion were perceived as very important or important by 88.9% and 84.1% of respondents, respectively, whereas monitoring of harms was less frequently mentioned. However, only activities in the fields of advertising or sale promotion, and increasing awareness, were considered to be successful by more than 50% of the respondents (Fig. 22; specific measures considered to be successful within the *Green Paper* domains are described in Annex 1, Fig. A1.7). Lack of political will and inadequate leadership (selected by 77.8% and 53.3% of respondents, respectively) rather than inadequate objectives (26.7% of respondents) or limited funding (17.8% of respondents) were seen as the main obstacles to the implementation of alcohol policy measures and the achievement of goals.

**Fig. 22.** Expert ratings on the success of alcohol policy domains



Source: Based on the original data of the expert survey, described in Annex 3.

In the context of general ratings, measured on a scale from 1 (very poor) to 10 (very good), the purpose of the *Green Paper* initiatives was rated significantly more highly than the outcomes and overall assessment of alcohol policy (see Annex 3). Of the measures that could potentially make alcohol policy more effective in the future, increased capacity for alcohol disorder treatment (agreed upon by 95.1% of respondents), limitations on the physical availability of alcohol (90.2%) and increasing municipal-level harm-reduction capabilities (89.5%) were most often selected. An APC of 8.6 L (standard deviation = 1.39) was estimated to be the alcohol consumption level that that would reduce alcohol-attributable harms in Estonia compared with the current situation. Of note, a threshold APC of 8 L is the target level in the current *Green Paper*, but it was considered to be achievable (likely–rather likely) within the next 10 years by only 37.8% of respondents.

# 3. Policy considerations



Overall, the *Green Paper* contributed to the health and well-being of Estonians until the decrease in alcohol excise tax in 2019 and the beginning of the COVID-19 pandemic. Since then, alcohol consumption (see Fig. 8) and attributable harm has increased (47).

The situation is especially problematic with respect to 100% alcohol-attributable diseases and causes of deaths, which have increased in Estonia by 53.0% since 2019. As of 2022, Estonia has the highest level of mortality due to 100% alcohol-attributable diseases in the EU (116).

Thus, it is important that some of the major *Green Paper* policies are renewed. The considerations for alcohol control policies are based on the evidence summarized in *Alcohol, No Ordinary Commodity* (74), but specifically tailored to the situation in Estonia and the results described above (see also (117)).

Clearly, given the increase in alcohol consumption seen from 2019, in part triggered by the taxation decrease in June 2019, increased taxation measures are required to reverse the trend. Taxation increases, which lead to a reduction in the affordability of alcoholic beverages (that is, which increase the price over and above increases in disposable income) have been shown to markedly reduce the levels of alcohol consumption (74).

## Policy consideration 1

**Increase alcohol excise taxation to reduce the affordability of alcoholic beverages. In order to sustain this effect, alcohol taxation should be coupled with inflation and/or any changes in disposable income reported in the previous year.**

The rationale for this recommendation is clear. While Estonia has experienced several increases in excise taxation in recent years, the tax rates in Estonia are still quite low, especially in comparison with tobacco taxation rates (118,119). Higher taxation rates will not only reduce alcohol consumption (120) and attributable harms (42), but will also increase government revenue (121).

## Policy consideration 2

**Increase the capacity of the treatment and care system for alcohol-attributable problems and alcohol use disorders.**

The COVID-19 pandemic, as has been predicted previously based on experiences of other natural and economic emergencies (40), led to the polarization of alcohol consumption: those who consumed heavily before the onset of the pandemic – including but not limited to people with alcohol use disorders – increased their consumption, and a large proportion of the population decreased their consumption due to availability restrictions (41,48,50,52,121). Estonia is no exception, as evidenced by the increases in 100% alcohol-attributable mortality in 2020 and 2021 (47), over and above any increases in any other EU country. Thus, the treatment and care system needs to prepare for an increase in demand for treatment and counselling for alcohol-attributable problems. Overall, it requires a continuum of care to treat alcohol use disorders, from brief interventions for hazardous drinking up to residential treatment (122), and current treatment rates are not sufficient (123,124). There are also indications that effective medications are underutilized, whereas antidepressants – which have been shown to be associated with detrimental outcomes – are still being used in the treatment of alcohol use disorder (122,125).

In addition to this, experts indicated that while there is a need for the treatment of children–adolescents who use alcohol, there are almost no facilities for it. This gap also should be considered when increasing treatment capacity.

## Policy consideration 3

**Implement further availability restrictions. In particular, decrease the density of sales points, limit the hours of on-premises drinking, prohibit alcohol sales from gas stations and via the internet, decrease Sunday openings of off-premises sales locations and establish a licensing system.**

Despite the gains made following the adoption of the *Green Paper*, Estonia is still one of the countries with the highest rates of heavy episodic drinking, with high rates of alcohol-attributable cardiovascular deaths among males (18) that are linked to heavy-drinking occasions (19,126,127). Availability restrictions are one of the best measures to reduce the number of heavy-drinking occasions (74).

As indicated above, Estonia has not implemented some of the proven effective measures to reduce alcohol availability. In comparison with Lithuania, it lags behind in the following indicators (see (4) for Estonia; (36–38) for Lithuania):

- ▶ minimal legal purchasing age;
- ▶ density of alcohol outlets;
- ▶ prohibition of selling alcohol at gas stations;
- ▶ opening hours for on-premises consumption;
- ▶ off-premises purchasing hours; and
- ▶ implementation of a licensing system, which clarifies who has the right to sell alcohol as well as the circumstances when a licence may be taken away in case of serious violations.

Most of these measures have shown success in reducing mortality and increasing public health (19,74). Just to give two examples: further restricting Sunday sales of alcohol has been shown to not only reduce alcohol consumption at the weekend, but also to reduce the excess mortality of injury and cardiovascular deaths on Mondays, typical for northeastern European countries. Restricting on-premises sales hours has also been shown to decrease instances of heavy episodic drinking and violence (80,128). Finally, a public health-oriented licensing system, which will help control the density of sales outlets and enable licences to be taken away from sellers who violate rules such as selling alcohol to minors, to intoxicated customers or outside of legal purchasing hours, has been shown to be an important component of effective alcohol control policies.

In addition, banning or restricting distance sales over the internet has shown promise in reducing various alcohol-attributable harms.

## Policy consideration 4

**Continue close monitoring and evaluation of all intervention studies.**

Whenever interventions are being planned, the evaluation of the outcomes in terms of effectiveness should be considered to be an integral part of these measures. This was been done previously in Estonia for a parent-oriented alcohol prevention programme called *Effekt (Effect)* (129) and a minimal-guidance self-help programme called *Selge (Clear)* (130), which both provide good examples of evidence-based policy evaluation. However, such evaluations need to be routinely implemented each time new alcohol control policies come into play, and should be integrated into an overall monitoring system that includes key dimensions of alcohol use and alcohol-attributable harms.

# Annexes



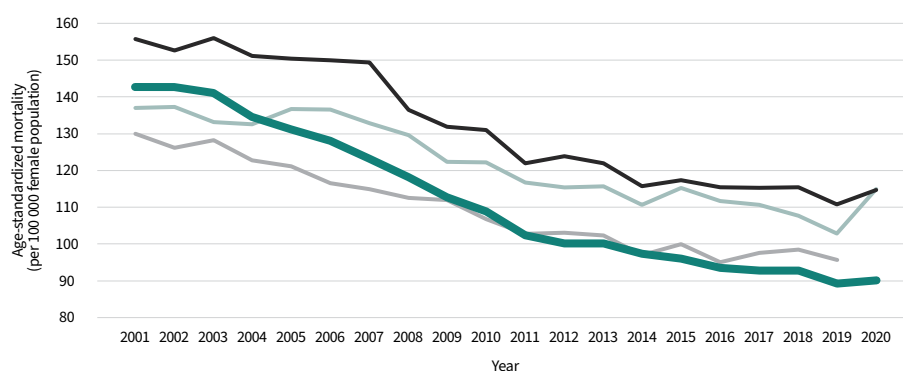
## Annex 1.

# Supplementary figures and tables

Additional figures (Fig. A1.1– Fig. A1.7) and tables (Table A1.1 and A1.2) are provided to give more context to the evaluation in the main text.

**Fig. A1.1.**

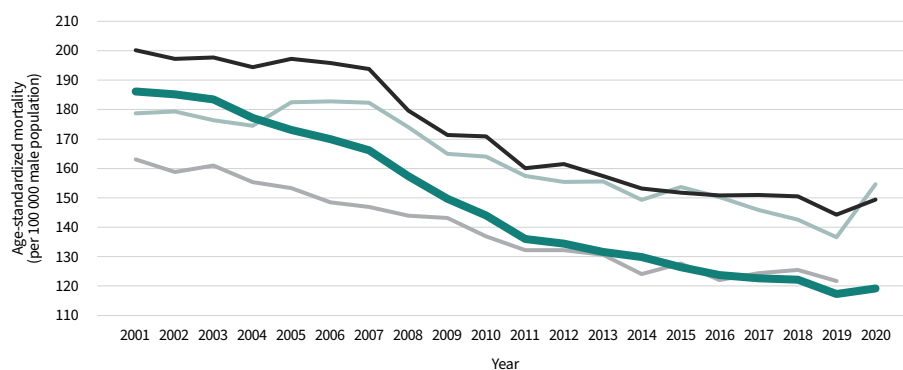
Age-standardized all-cause mortality for females (aged 20 years and over) in the Baltic countries and Poland in between 2001 and 2020



Source: (81), using European Standard Population (82).

**Fig. A1.2.**

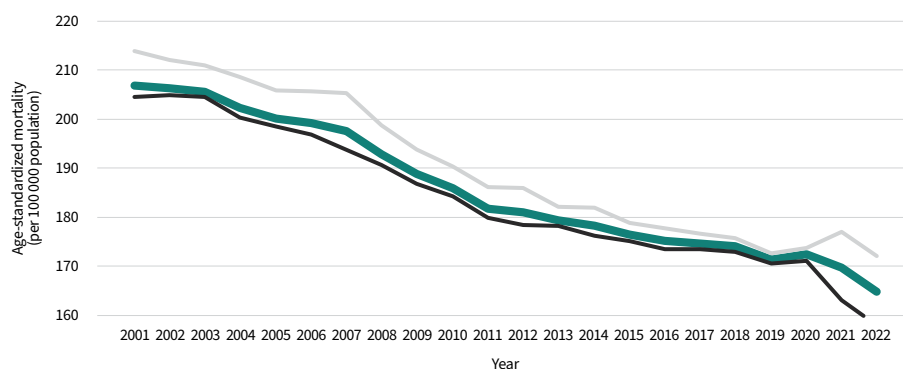
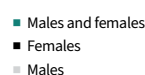
Age-standardized all-cause mortality for males (aged 20 years and over) in the Baltic countries and Poland between 2001 and 2020



Source: (81), using European Standard Population (82).

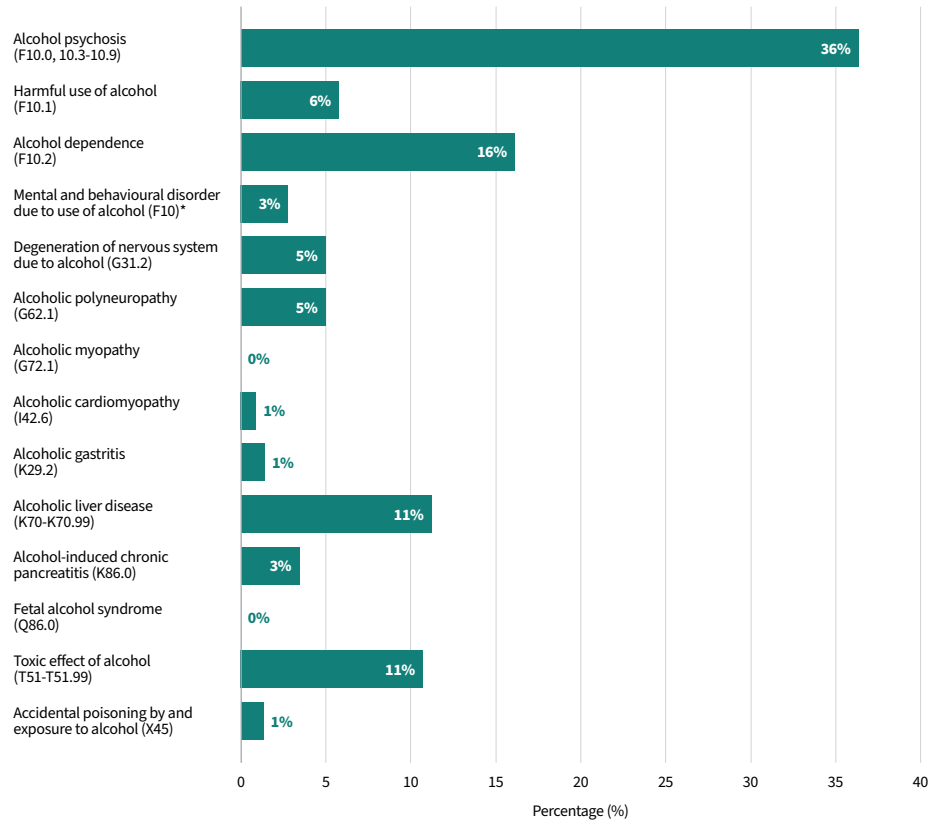
**Fig. A1.3.**

Age-standardized all-cause mortality per 100 000 population (aged 15 years and over) in Estonia in between 2001 and 2022



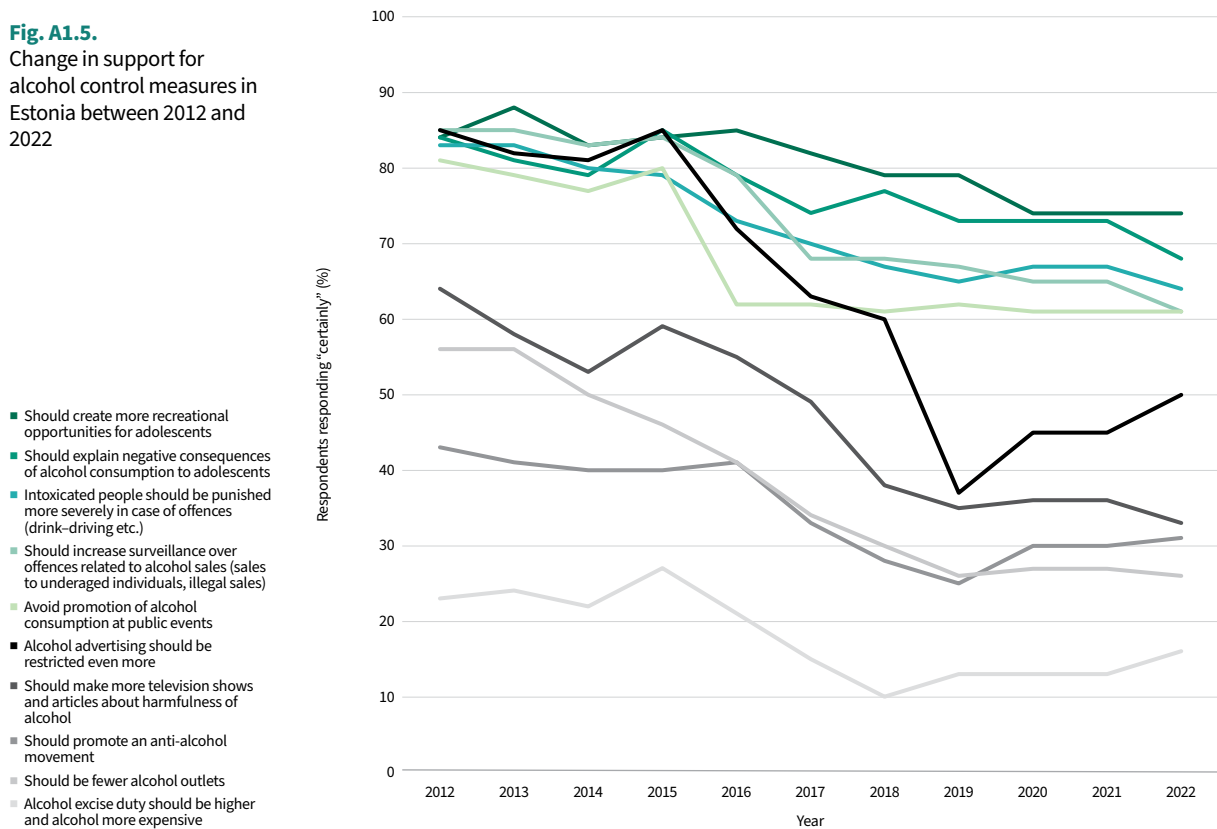
Source: Author calculations based on mid-year population of Estonia (84), standardized to 2020 population distributions of Estonia (separated for females, males and both combined).

**Fig. A1.4.**  
Distribution of diagnoses  
in alcohol-attributable  
morbidity per 100 000  
inhabitants in Estonia  
between 2013 and 2022



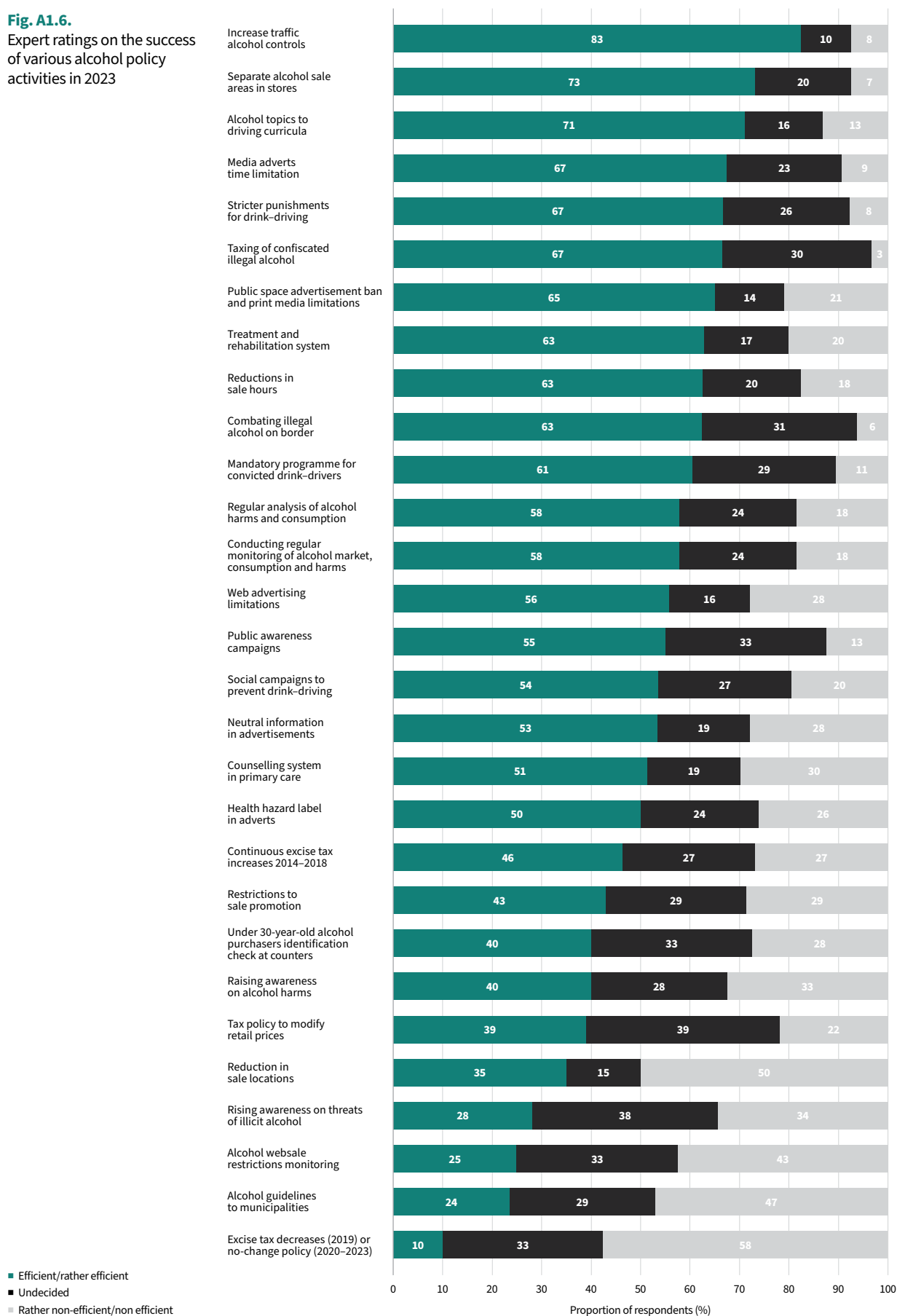
Source: (71,81,93,94).

**Fig. A1.5.**  
Change in support for  
alcohol control measures in  
Estonia between 2012 and  
2022



Source: (115).

**Fig. A1.6.**  
Expert ratings on the success of various alcohol policy activities in 2023



Source: Based on the original data of the expert survey, described in Annex 3.

**Table A1.1.** Description of *Green Paper* activities

Domain-activity	Status	Description	Comment
<b>1. Limitation of availability</b>			
1.1. Allow for the sale of alcohol in retail stores only if in a separate sales area	Implemented in 2019 (Alcohol Act §40 amendment) (106)	Alcoholic beverages must not be placed in such a way that the consumer inevitably comes into contact with them when visiting the store, and their display must not be noticeably visible from the rest of the sales hall, except for the area of the sales hall where the cash register is located, and which is not accessible to the consumer.	Potential evaluation metrics are overall retail sale statistics, APC consumption and mystery shopping study data.
1.2. Toughen penalties for making alcohol available to minors	Implemented in 2015 (Alcohol Act §67 amendment)	Violation of the age limit when handling an alcoholic beverage is punishable by a fine of up to 300 fine units or arrest. The same act, if it has been committed by a legal entity, is punishable with a fine of up to 10 000 euros.	Limited effect in terms of population health.
<b>2. Alcohol advertising and sales promotion restrictions</b>			
2.1. Allow only neutral information to be presented in alcohol advertisements	Implemented in 2018 (Advertising Act §28 amendment)	Information contained in alcohol advertising must be presented in a product-oriented and neutral manner.	Indirect effects can potentially be evaluated using survey and population health statistics data. The effects of the simultaneously enacted advertising restrictions cannot be distinguished from one another.
2.2. Ban outdoor alcohol advertisements	Implemented in 2018 (Advertising Act §28 amendment)	Prohibition of outdoor alcohol advertisements.	Indirect effects can potentially be evaluated using survey and population health statistics data. The effects of the simultaneously enacted advertising restrictions cannot be distinguished from one another.
2.3. Restrictions on print media advertisements	Implemented in 2018 (Advertising Act §28 amendment)	Alcohol advertising is prohibited not only on the front and back pages of newspapers and magazines, but also on the front and back pages of additional editions of newspapers and magazines.	Indirect effects can potentially be evaluated using survey and population health statistics data. The effects of the simultaneously enacted advertising restrictions cannot be distinguished from one another.
2.4. Television and radio advertisement regulations	Implemented in 2018 (Advertising Act §28 amendment)	Alcohol advertising on television and radio prohibited from 07:00 to 22:00 (same regulations apply for internet media).	Indirect effects can potentially be evaluated using survey and population health statistics data. The effects of the simultaneously enacted advertising restrictions cannot be distinguished from one another.
2.5. Implementation of health hazard warnings	Implemented in 2018 (Advertising Act §28 amendment)	In print media, warning text: "Attention! It is alcohol. Alcohol can harm your health." must be presented, and make up at least 20% of the total area of the advertisement. In radio and television advertisements, warning text must be presented.	Indirect effects can potentially be evaluated using survey and population health statistics data. The effects of the simultaneously enacted advertising restrictions cannot be distinguished from one another.
<b>3. Alcohol pricing and tax policy</b>			
3.1. Increase alcohol excise duty by an average of 5% per year over the next 4 years	Annual changes in Alcohol, Tobacco, Fuel and Electricity Excise Duty Act	Between 2012 and 2016, the alcohol excise duty was raised annually by 5–15%, followed by a biannual increase in 2017. In 2018, the excise tax increase was 20% on wine, 10% on intermediate products, 9% on cider and beer, and 5% on strong alcohol. This was followed by a 25% reduction in excise duty rates on beer, cider and spirits on 1 July 2019.	<i>Included in the evaluation.</i>
<b>4. Prevention of clandestine alcohol</b>			
4.1. Tighten control measures for those repeatedly caught with contraband alcohol	Implemented in 2015 (Penal Code §375 amendment)	Maximum term of imprisonment increased to 5 years and the possibility of extended confiscation of property added.	Limited effect in terms of population health.

**Table A1.1.** Contd.

Domain-activity	Status	Description	Comment
4.2. Excise taxation of illegal alcohol	Implemented in 2017 (Alcohol, Tobacco, Fuel and Electricity Excise Duty Act amendment)	The alcohol is confiscated but the tax is still collected.	Can potentially be assessed in terms of market share of illegal alcohol, limited effect in terms of population health.
4.3. Prevent the sale-handling of alcohol-containing cosmetic products and other alcohol-containing liquid	Implemented in 2015 (Alcohol Act §53 amendment)	Non-drinkable (denatured) alcohol is covered by the Alcohol Act if it is consumed as an alcoholic beverage.	Can potentially be assessed in terms of market share of illegal alcohol (survey data), limited effect in terms of population health
<b>5. Harm reduction</b>			
5.1. Prohibition of alcohol consumption in public places	Implemented in 2014 (Law and Order Act §69 amendment)	Consumption of alcohol in public places is once again prohibited.	Consumption of alcohol in public places was allowed very briefly (July–December 2014) and its effects cannot be evaluated in terms of population health.
5.2. Campaigns to develop disapproving attitudes towards driving or swimming while intoxicated	Annual	Several public campaigns, for example, 2013: “Drink half as much!”, 2014: “Less is better”; 2014–2015: “A FRIEND does not let a drunk FRIEND drive”; 2016: “Less alcohol = more life”, 2014: “Thank you, mom! Thank you, dad!”, 2016: “Even little is too much!”, and 2021: “Where is your limit?”	Survey data on alcohol consumption and population health statistics (mortality) can potentially be used. Given the ongoing nature of the campaigns, no threshold can be established for the evaluation.
<b>6. Drink-driving measures</b>			
6.1. Alcohol topics added to driver’s training curriculum	Implemented 2020	Increase of classroom lessons in the curriculum for motor vehicle drivers from 2 to 6 hours.	The training affects new drivers and thus has limited effect on population-level health indicators.
6.2. Increase the number of random drunkenness checks	Ongoing–2017	In 2013, the number of drunkenness checks was 620 309; since 2017, the objective is a minimum of 700 000 checks per year.	Given the ongoing nature of the campaigns, no threshold can be established for the evaluation.
<b>7. Local government activities</b>			
7.1. Increase in the proportion of local authorities that implement multicomponent local alcohol abuse and harm-reduction programmes	Pilot study 2014–2017	Local-level alcohol policy pilot project took place, in which six socioeconomically and regionally different municipalities participated.	A pilot study with limited scope; separate evaluation already performed for the pilot.
<b>8. Treatment and counselling</b>			
8.1. Develop a system in primary health care for early detection and counselling of alcohol abuse	2016	Early detection and brief intervention for excessive alcohol consumption clinical guidelines published and used by general practitioners.	Morbidity and health service usage statistics can potentially be used.
8.2. Develop a modern system for the treatment and rehabilitation of alcohol dependence	2014	The treatment manual prepared in 2014 and the programme “Sober and healthier Estonia” started in 2016. Starting in 2020, an online self-help programme <i>Selge (Clear)</i> launched to reduce excessive alcohol consumption.	Survey data, morbidity and health service usage statistics can potentially be used.
<b>9. Raising awareness</b>			
9.1. Campaigns aimed at increasing awareness on alcohol harms and reducing excessive alcohol consumption	Ongoing	Several annual campaigns (see Section 5.2.).	Given the ongoing nature of the campaigns, no threshold can be established for the evaluation.
<b>10. Monitoring and evaluation</b>			
10.1. Annual overviews of alcohol harms, consumption and awareness indicators	Ongoing	Alcohol yearbooks published.	Cannot be evaluated in terms of population health.

**Table A1.2.** Alcohol sale locations and distance to the nearest location in Estonia between 2010 and 2023

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Registered sales points</b>	Retail sales outlets	2633	2609	2609	2591	2628	2724	2868	2997	3011	3137	3028	3197	3354	3396
	Wholesale	389	419	419	480	517	609	880	794	816	880	859	921	956	996
	On-premises	2863	2957	2957	2899	2967	3331	3548	3911	3979	4314	4192	4479	4772	4942
	Total	5885	5985	5985	5970	6112	6664	7296	7702	7806	8331	8079	8597	9082	9334
<b>Registered alcohol sales points per 1000 inhabitants</b>	Retail sales outlets	2	2	1.9	2	2	2.1	2.2	2.3	2.3	2.4	2.3	2.4	2.5	2.5
	On-premises	2.2	2.1	2.2	2.3	2.3	2.5	2.7	3	3	3.3	3.2	3.4	3.6	3.6
	Total <sup>a</sup>	4.4	4.4	4.5	4.6	4.6	5.1	5.6	5.9	5.9	6.3	6.1	6.5	6.8	6.8
<b>Registered alcohol sales points per 10 km<sup>2</sup></b>	Retail sales outlets	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
	On-premises	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1	1	1	1.1	1.1
	Total <sup>a</sup>	1.3	1.3	1.3	1.4	1.4	1.5	1.7	1.8	1.8	1.9	1.9	2	2.1	2.1
<b>Distance to the closest alcohol sales point from the place of residence 2010–2022 (survey results, % of responders)</b>	In the dwelling-house or neighbouring building	87	88	83	86	86	85	87	83	88	85	86	88	88	NA
	Up to 30 minutes	10	10	14	11	12	12	11	13	10	13	12	10	11	NA
	More than 30 minutes	3	2	3	3	2	3	2	4	2	2	2	2	1	NA

NA: not applicable.

<sup>a</sup> Includes wholesale outlets.

## Annex 2.

# Mapping the *Green Paper's* proposed measures to the WHO Global Strategy to reduce harmful alcohol use

The following section provides an overview of all the proposed measures of the *Green Paper* as mapped against the 10 areas of the WHO's *Global Strategy to Reduce the Harmful Use of Alcohol (12)*.

## 1. Limitation of alcohol availability

- 1.1. Allow the sale of alcohol only in a separate sales area of retail stores or from a service counter. Plan future measures for alcohol sales for separation from the sale of other goods.
- 1.2. Consider applying the requirement that the area where alcohol is sold must be separated from the rest of the sales area by screens following a reasonable transition period.
- 1.3. Develop measures to improve the supervision of alcohol sales on the internet, including to prevent sales to minors, to conduct research in the field for mapping.
- 1.4. Toughen penalties for making alcohol available to minors.
- 1.5. Improve the supervision of the ban on the sale of alcohol to minors (that is, to create legislative possibility to involve minors in control purchases).
- 1.6. Require persons under the age of 30 years to show identification to the seller when buying alcohol, and the seller to ask for identification in case of doubt.
- 1.7. Develop additional tools of influence and measures for minors caught drinking alcohol, including education and counselling programmes, and design the practice of applying influence tools; develop Police and Border Guard Board, juvenile commission, local government and Health Development Institute's cooperation in influencing minors.
- 1.8. Facilitate awareness-raising activities for parents, vendors, event organizers and the general public to increase society's support for preventing the availability of alcohol to minors.
- 1.9. Start a discussion on raising the age limit for buying and consuming alcohol.
- 1.10. Conduct regular mystery shopping studies on the sale of alcohol to minors and publish the results.
- 1.11. Develop cooperation with the private sector in preventing the sale of alcohol to minors.

- 1.12. Support initiatives to popularize alcohol-free days and periods, and form an attitude in society that it is important for children and young people that on holidays, including 1 June and 1 September, alcohol consumption should be avoided.
- 1.13. Analyze and consider options to reduce retail locations.

## 2. Limitations on sales promotions

- 2.1. Consider amending the Advertising Act in such a way that only neutral information about the main features of the product (excluding people, describing the atmosphere and telling stories) is allowed to be presented in alcohol advertisements.
- 2.2. Limit advertising in different channels, including banning outdoor advertising, and banning alcohol advertising on the front and back pages of newspapers and magazines. Establish an additional time limit on alcohol advertising on television and radio from 07:00 to 22:00, develop and support proposals for regulating alcohol advertising on the internet and support voluntary agreements to further limit alcohol advertising.
- 2.3. Allow alcohol tasting only in the alcohol sales area.
- 2.4. Prohibit the use of alcoholic beverage or brand in-sales promotion of other goods (cross-marketing).
- 2.5. Clarify the advertising law so that the offer of free alcohol is prohibited in advertising. Specify the rules for mandatory health hazard warnings in television and radio advertising.
- 2.6. Establish the health-warning format for print advertisements as a percentage of the advertising area and as a minimum size.
- 2.7. Vary the health-warning messages, including both health and risk behaviours for topics (traffic, water safety, etc.).
- 2.8. Apply more fines, and not only warnings, and increase the upper limits of fines. Both the advertiser and the publisher could be fined for breaking the law.
- 2.9. Strengthen the law to make it easier for law enforcement to identify and fix advertising that obviously contradicts the current regulations, so the supervisory officer has the opportunity and the legal basis for stopping the publicity of the advertising campaign.
- 2.10. Create an opportunity to immediately exercise the right to issue an injunction in case of repeated violations without hearing from the other side.
- 2.11. Recommend that the private sector implements regular self-regulation measures to independently assess and ensure compliance.
- 2.12. Advise alcohol producers not to sponsor alcohol as part of self-regulation in family and sports events where minors participate.

## 3. Tax and pricing policies

- 3.1. Increase alcohol excise duty by an average of 5% per year over the next 4 years.
- 3.2. Develop a long-term framework (the Ministry of Social Affairs and the Ministry of Finance) for alcohol taxation, ensuring that: a) alcohol does not become cheaper compared with income and becomes more expensive in the long term; b) the increase in alcohol excise duty (and the impacts of other instruments) should be gradual and predictable within a reasonable time frame to avoid explosive growth of an underground market; c) when taxing alcoholic beverages, the impacts on health, illicit markets, residents' incomes and price levels in neighbouring countries, etc., should be considered.

- 3.3. Allocate additional funds to combat the black market when implementing a significant increase in alcohol excise duty.
- 3.4. Direct a share of the alcohol excise to reduce health damage, including treatment.
- 3.5. Consider the possibility of establishing a minimum price for alcohol, or implementing other measures, to prevent the sale of alcohol below its production price. For this purpose, collect and analyze information related to minimum prices from international practice, monitor respective developments in EU countries and analyze the possibilities of implementing a minimum price in Estonia.
- 3.6. Support policy changes in the EU that enable the taxation of mixed drinks.

## 4. Prevention of illegal–clandestine activities (reduction of unrecorded consumption)

- 4.1. Tighten control measures for those repeatedly caught with contraband, speed up the imposition of penalties both at the customs border and inland, and apply for the arrest of repeat offenders.
- 4.2. Intensify the tackling of crime related to clandestine alcohol in areas close to the Estonian–Russian border.
- 4.3. Develop cross-border cooperation with Russia related to clandestine alcohol to prevent crime.
- 4.4. Tax all excise goods illegally brought into the country, regardless of confiscation.
- 4.5. Implement thorough checks on people involved with smuggling to tax illegally obtained income.
- 4.6. Apply annulment for permits and visas for persons caught smuggling.
- 4.7. Obtain modern customs equipment to detect contraband.
- 4.8. Influence the consumer to give up clandestine alcohol. Inform the public about clandestine alcohol and its dangers by determining and publishing details of the chemicals in illegal, unregistered alcohol with descriptions of health effects.
- 4.9. Notify smuggler’s employer, the municipality and other institutions related to the person.
- 4.10. Consider measures to prevent the sale–handling of alcohol-containing liquids that are not alcohol in the sense of the Alcohol Act.
- 4.11. Develop underground market surveillance and support related research.
- 4.12. Develop cooperation between the state and the private sector in combating the illegal market.

## 5. Education and harm-reduction measures

- 5.1. Strengthen control on alcohol use in public places and on compliance with rules related to selling alcohol to an intoxicated customer.
- 5.2. Conduct publicity campaigns to create an intolerant attitude to drunkenness while swimming or driving.
- 5.3. Develop a training programme aimed at waiters to help them identify and avoid conflict situations when communicating with an intoxicated customer, and increase service providers’ awareness of the prohibition of selling to an intoxicated customer; consider making such training compulsory.
- 5.4. Develop lodging services with the necessary medical care for intoxicated persons.
- 5.5. Propose that the European Commission make the health warnings for alcoholic beverages mandatory on the packaging throughout the European Union.

## 6. Drink-driving measures

- 6.1. Amend drivers' training curriculum with topics of alcohol as a risk factor and risk limits, review the driving test questionnaires and increase the number of contact hours. In-depth coverage in the training of professional drivers.
- 6.2. Provide training for high-school and vocational education students on risk-taking behaviour causes and ways to avoid it.
- 6.3. Apply mandatory awareness and counselling programmes for those caught driving while intoxicated (i.e. introduce compulsory alcohol early detection and brief counselling of excessive consumption, and alcohol dependence treatment option).
- 6.4. Increase the number of random drunkenness checks by the Police and Border Guard Board, including at border crossings and ports.
- 6.5. Require companies providing transport services to ensure drivers take an alcohol test before starting work.
- 6.6. Improve the availability of ways to determine intoxication.
- 6.7. Continue analysis-based traffic monitoring.
- 6.8. Apply harsher legal consequences to offenders to encourage them to refrain from committing new violations.
- 6.9. Continue organizing social campaigns to prevent drunken driving, including organizing well-thought-out and implemented intensive campaigns in specific situations (for example, Midsummer Day, New Year, holiday period) or for a specific target group (for example, young people).
- 6.10. Continue the operation of the all-Estonia traffic hotline for reporting dangerous road users to the police.

## 7. Local government activities

- 7.1. Support local authorities that implement multicomponent local alcohol abuse and harm-reduction programmes through national strategies, legislation and financial instruments (where possible).
- 7.2. Support local governments (strategies, legislation and financial means) who have active health councils or committees capable of planning and implementing effective health promotion strategies, including alcohol policy measures, if possible.
- 7.3. Map and analyse Estonian local-level alcohol policy practices, and create opportunities for local governments to exchange knowledge and experience.
- 7.4. Develop instructional material on local alcohol policy design and a training and counselling programme.

## 8. Raising awareness

- 8.1. Adhere to the following principles when conducting outreach activities: a) notification must be target group-based, based on specific target group attitudes and problems, b) communication must be consistent, and c) only localized and validated programmes may be carried out in schools.
- 8.2. Provide information about the effects of alcohol and tools to assess alcohol consumption.
- 8.3. Promote social norms that disapprove of excessive alcohol consumption and drunkenness at public events, and favour the organization of alcohol-free events.

- 8.4. Promote a positive attitude towards the reduction of alcohol consumption and towards abstinence.
- 8.5. Provide parents with support and training to prevent youth alcohol use.
- 8.6. Inform young people about the possible legal consequences of alcohol consumption.

## 9. Treatment and counselling

- 9.1. Develop an early detection and counselling system for alcohol abuse in primary health care.
- 9.2. Develop a modern system of treatment and rehabilitation of alcohol dependence.
- 9.3. Ensure competence through the training, guidance, networking and funding of personnel providing services.

## 10. Monitoring and evaluation

- 10.1. Analyse alcohol indicators annually, aggregate them and publish them in an alcohol yearbook.
- 10.2. Conduct regular market, consumption and health impact studies, ensuring consistency of research methodology when ordering studies.
- 10.3. Convene a working group annually, where alcohol policy performance is evaluated

## Annex 3.

# Alcohol policy expert survey: methodology and key findings

## Methodology

The Estonian alcohol policy expert survey was an anonymous cross-sectional survey conducted in September 2023 by the authors. The purpose of the survey was to map the perceived importance of objectives, measures and initiatives of current alcohol policy, and to gain input on possible future directions in alcohol policy.

The expert sample included a wide range of experts, policy-makers and practitioners, related directly or indirectly to alcohol policy and/or the prevention of harms in their daily work. A total of 73 experts from 31 different organizations (including seven ministries, eight state agencies, six health care institutions, two research institutions, local governments, and from social protection and health care organizations) were represented in the sample based on openly available email addresses. The survey questionnaire (27 numbered questions) was developed based on the activities and initiatives listed in the *Green Paper*, with additional items covering possible future goals, target levels and novel approaches for Estonian alcohol control policy. Additional qualitative data were collected with 16 open questions, where the experts could provide additional information and explain and justify their opinions.

The survey was conducted as an anonymous online survey using the online LimeSurvey website (see (131) for details). Survey invitations were sent out on 14 September 2023, and reminder letters were sent to non-respondents on 21 September 2023. The survey invitation contained basic information regarding the purpose and organization of the study, and explained that participation was voluntary and anonymous. Data collection for the study ended on 29 September 2023. In total, 49 full or partial responses were received and included in the data set (that is, the survey response rate was 67.1%). There were two refusals, and no response was received from 22 people who were invited to take part in the study. Overall, 46.5% ( $n=20$ ) of the respondents considered themselves an expert, 30.2% ( $n=13$ ) a policy-maker and 23.3% ( $n=10$ ) a practitioner. Among the fields of activity, medicine–health care (20%) or internal security–security (20%) were mentioned most often.

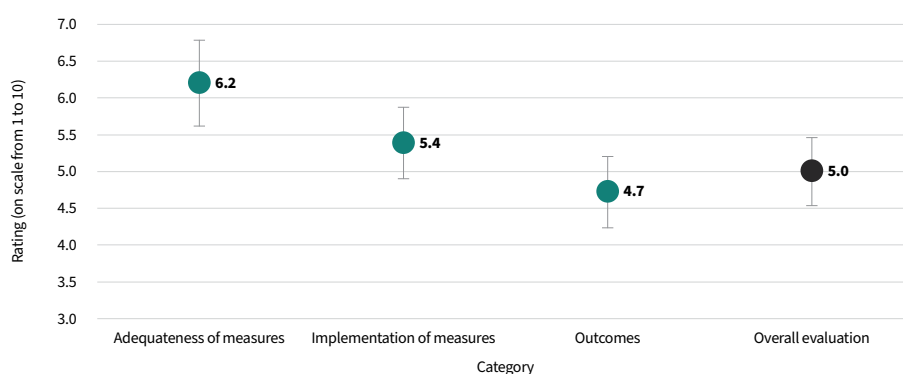
# Key findings: quantitative and qualitative perspective

## Overall assessment of Estonia’s alcohol policy over the past 10 years

Experts’ assessments on the effectiveness of national alcohol policy, measured on a scale from 1 (very poor) to 10 (very good), valued the purpose of the *Green Paper* initiatives significantly more highly than its implementation and outcomes. Therefore, the overall assessment of alcohol control policy was relatively low (Fig. A3.1). Qualitative synthesis of free-text comments for this item ( $n = 14$ ) is given below.

**Fig. A3.1.**

Expert ratings on the success of alcohol policy stages in Estonia, mean scores with 95% confidence intervals



Source: Based on the original data of the expert survey.

Experts based their evaluations of Estonian alcohol control policy on a mixed set of arguments. The majority of opinions concluded that the aims of alcohol policy had been good, and that the right steps had generally been taken. However, the results were not very successful since there was a lot of inconsistency in the measures taken (excise reversal has been mentioned several times) and in political focus on the field of alcohol policy. The improvement in counselling and treatment of alcohol disorders was one of the areas that received praise. One respondent stated, *“it is to be commended that great progress has been made in terms of treatment and counselling during the period, but in several other topics the focus has been mainly on raising awareness and the statistics show that these steps have not been successful.”*

Several experts were critical of the outcomes of alcohol policy, highlighting that the reversal of the declining trend of alcohol per capita consumption and the increase in alcohol-related mortality does not warrant a positive overall opinion. One expert elaborated his–her opinion on alcohol policy outcomes from the availability aspect: *“availability continues to be the most problematic: the number of outlets and the price of alcohol. The desired result, bringing the consumption below 8 L per inhabitant per year, has remained unattainable to this day.”*

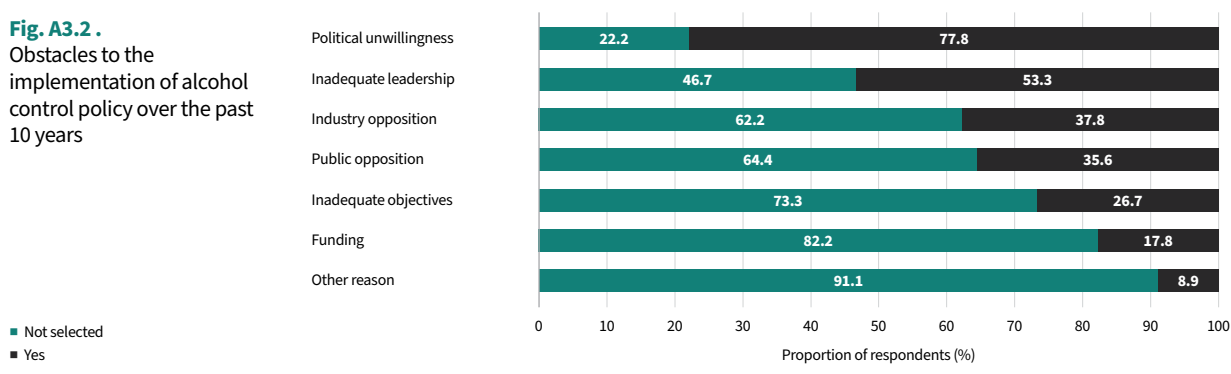
Although various aspects were brought out by the experts, the general theme emerging from these data associates poor alcohol policy outcomes with a lack of political focus, coordination, determination and communication.

## Experts' views on the main obstacles to the implementation of alcohol control policy measures and the achievement of goals

Lack of political will and inadequate leadership (selected by 78% and 53% of respondents, respectively) were seen as the key factors hindering the implementation of alcohol policies envisioned in the *Green Paper* over the past 10 years (Fig. A3.2). Industry and public opposition were also often mentioned, whereas inadequate objectives, lack of funding and other reasons were stated less frequently. Qualitative synthesis of free-text comments (available for all items, 70 comments in total) is provided below.

**Fig. A3.2.**

Obstacles to the implementation of alcohol control policy over the past 10 years



Source: Based on the original data of the expert survey.

Lack of political will was explained as resulting from alcohol control not being a politically “rewarding” topic, and hence there was a perceived lack of courage to implement measures from a public health perspective. Although some periods had seen determined political will and action (*“After minister Ossinovski, there has not been political courage”*), politicians were generally viewed to have been ambivalent in setting priorities and keeping track of them. One respondent stated, *“...political will is volatile and depends on the existing government.”*

Leadership in the alcohol control field was seen by the experts as fragmented and chaotic. There was a perceived lack of coordination and collaboration between institutions working with the field, resulting in insufficient and ineffective communication. The weakness of monitoring capability was also mentioned on several occasions. As with political will, the inconsistency in political priorities was viewed as a major hindrance for leadership in alcohol control, with one respondent stating *“Ambivalence in politics does not allow for effective leadership.”*

In the experts' views, the alcohol industry protected its interests by manipulating the public and stakeholders (retail sellers, entertainment sector), opposing advertising regulations and lobbying politicians, stating, *“Too many interested parties are involved in the law-making or amendment process, who lobby away good measures.”*

Public opposition as a hindrance to implementing alcohol control policies was, in the experts' views, often rooted in shortcomings in tax policy. Tax increases could be interpreted as excessive regulation of the private sphere (an individualistic approach to behaviour as a free choice), but there were also populist sentiments that policy makers could not successfully compete against. Poor communication of policy aims allowed (stakeholders) to manipulate public opinion using the social stratification “card”: *“the mob and the price of beer’ is a very explosive topic that can be manipulated by the public.”*

However, a few experts also noted that a change in public mindset is taking place and that alcohol use is not necessarily seen as integral part of (life) events. Experts expressed mixed perspectives on the suitability–adequateness of alcohol control policy objectives. Two differing points of view emerged from the responses. The antiprohibition argument was voiced on several occasions, based on the reasoning that alcohol is an integral part of society and, thus, that instead of prohibition, policy should focus on strong communication to increase alcohol awareness and support reasonable consumption: *“Prohibition is not the solution. At present, the imposition of all kinds of bans has created opposition to restrictions, but there is a major lack of awareness.”*

The other group expressed a desire for a more focused public health perspective, emphasizing the need to tackle the root causes of alcohol consumption. Their view was that for policies to be effective, stronger measures than increased awareness are needed, indicating that, *“lack of awareness plays a small and insignificant role in alcohol consumption. It is unclear why the focus has been taken on raising awareness.”*

While lack of funding was not considered an issue, experts mentioned the lack of a general strategy, lack of surveillance and the monotony of current measures. Alcohol control policy was also seen to be something enforced at the governmental level without the inclusion of municipalities. Some experts also pointed out a lack of focus on alcohol culture, noting, *“little attention has been paid to the cultural issue—how to change consumer culture.”*

## Experts’ views on unresolved issues and continuing problems in alcohol control policy topic areas

Experts’ perspectives on important yet currently unresolved topics in Estonian alcohol control policy highlighted several noteworthy themes. Alcohol availability was a topic that was elaborated on by over 25 experts. In general, alcohol was seen as product that is widely accessible for the population in general. Several experts referred to the easy availability of alcohol for high-risk groups (alcohol abusers, minors–adolescents and intoxicated persons), and problems with surveillance–enforcement of ID checks for minors purchasing alcohol and the sale of alcohol to intoxicated persons. Although the general sentiment emphasized an increase in retail sales locations, the sale of alcohol in gas stations and web-based sales were seen as being especially problematic. For several positive measures (partial display ban for example), the increasingly lower level of monitoring is worrying, with one respondent noting, *“monitoring existing measures is a growing problem, especially for online sales. Over the past 5 years, supervision has decreased and it is immediately apparent that, for example, separate sales areas are becoming blurred, age control has been relaxed.”*

Advertising regulations are, in most experts’ views, too inconsistently applied, with the main problem areas being the large variation in regulations for different media channels, from tightly regulated outdoor advertising to practically no restrictions on web advertising exposure through social media. Also, the industry and retailers cleverly bypass these restrictions via brand advertising of alcohol producers–retailers. Many experts emphasized the need for a total ban on alcohol advertising, as monitoring of current measures is not sufficient, with one respondent noting, *“the more complex and multi-interpretable the rules are, the more difficult it is for businesses to comply with them and the more costly it is for the state to control compliance. Rules with a wide scope for interpretation or rules whose enforcement cannot be effectively controlled are not self-justifying.”*

From the experts’ perspectives, alcohol taxation was seen to be a central topic of alcohol control policy, yet mixed positions appeared in their opinions. The majority of experts stated that the current alcohol excise tax was not sufficient to limit consumption, but that it should be one of the most effective measures for it. The

reasons were associated with a non-indexed tax rate and a lack of a minimum unit price, which have made alcohol increasingly affordable.

However, several experts provided contrasting views, stating that taxation of alcohol does not necessarily address the “problem of alcoholism” in the population, and that slow but gradual increase in taxation has not achieved a reduction in “alcoholism” over the last 10 years. The general sentiment in experts’ opinions emphasized the problems of consistency and the perceived objectives of tax policy, and was summarized by one of the experts as *“...excise policy has been made followed by emotion and possibilities, there is no analytical approach. Also, excise duty and tax policy have been more of a measure to cover the budget than a measure to limit availability.”*

Although most experts commented that they are personally not competent-informed in the field of unresolved topics regarding illicit alcohol, several of them noted that consumption of illicit alcohol itself is currently not a very big problem, but hinted at the role of cross-border trade: *“illegal alcohol is not as much a topic as legal alcohol bought from another country.”*

Experts’ comments about unsolved topics in relation to drink-driving generally approved of the substantial progress made in this field (increased traffic surveillance, awareness campaigns, etc.). Some experts criticized the practice of offering first-time offenders the possibility to participate in preventive programmes, *for example, “the effects of the programmes offered to drink-drivers have not been evaluated, while they are quite expensive for the offender. The recidivism rate of drunk driving has not improved over time, so it cannot be said that the adapted punishment practice is effective.”*

Another prevailing sentiment emphasized a need for stricter punishments to reduce societal tolerance of drink-driving.

Experts’ comments about unsolved topics in raising awareness and harm reduction demonstrated a diverse set of opinions. There was perceived to be a lack of impact assessment for both the social harms of alcohol consumption and for policy measures, either planned or implemented. The potentially low effectiveness of awareness campaigns was frequently mentioned. For treatment opportunities, issues regarding regional inequalities in availability and in the quality of care were raised, with one respondent noting, *“...there are certainly significant areas for improvement both in the detection and counselling system, in treatment queues, and in the areas of empowering the alcohol policy of local governments.”*

## Experts’ suggestions for further steps in alcohol control policy

Qualitative responses to the questions “What areas should Estonia’s alcohol policy focus on in the future?” and “Which measures should be implemented in the future for an effective alcohol policy?” highlighted the need for a broader, intersectoral approach in alcohol control policy. Such synergies could ideally result in cooperation that will result in a “cultural shift” related to alcohol. Additionally, more specific suggestions emphasized the need for a better and more widely available counselling and treatment system that is part of the wider harm prevention system. Implementation of an alcohol-licensing system, reducing the number of alcohol point-of-sale locations and limiting sale hours were suggested to have potential as part of future policy measures. However, several experts expressed the opinion that restrictive alcohol policy measures could potentially cause additional harms and have unexpected or negative consequences.



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**World Health Organization  
Regional Office for Europe**

UN City, Marmorvej 51  
DK-2100, Copenhagen Ø, Denmark  
Tel.: +45 45 33 70 00  
Fax: +45 45 33 70 01  
Email: [eurocontact@who.int](mailto:eurocontact@who.int)  
Website: [www.who.int/europe](http://www.who.int/europe)



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