

# Impact of the WHO "best buys" for alcohol policy on consumption and health in the Baltic countries and Poland 2000–2020



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## Summary

**Alcohol use is a major risk factor for burden of disease. This narrative review aims to document the effects of major alcohol control policies, in particular taxation increases and availability restrictions in the three Baltic countries**

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(Estonia, Latvia, and Lithuania) between 2000 and 2020. These measures have been successful in curbing alcohol sales, in general without increasing consumption of alcoholic beverages from unrecorded sources; although for more recent changes this may have been partly due to the COVID-19 pandemic. Moreover, findings from time-series analyses suggest improved health, measured as reductions in all-cause and alcohol-attributable mortality, as well as narrowing absolute mortality inequalities between lower and higher educated groups. For most outcomes, there were sex differences observed, with alcohol control policies more strongly affecting males. In contrast to this successful path, alcohol control policies were mostly dismantled in the neighbouring country of Poland, resulting in a rising death toll due to liver cirrhosis and other alcohol-attributable deaths. The natural experiment in this region of high-income European countries with high consumption levels highlights the importance of effective alcohol control policies for improving population health.

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## Introduction

Alcohol consumption has been identified as a major risk factor for mortality and burden of disease.<sup>1,2</sup> The European Union (EU) has the highest level of alcohol consumption globally; seven of the 10 highest ranked countries are part of this region.<sup>3</sup> However, despite the high levels of drinking and, consequently, the high proportion of alcohol-attributable mortality in all-cause mortality, effective alcohol control policies are often lacking.<sup>4</sup> This is especially true for the so-called “best buys” recommended by the World Health Organization (WHO) to reduce alcohol-attributable non-communicable disease and mortality, i.e., increasing prices via taxation, reducing availability of alcoholic beverages, and banning marketing.<sup>5</sup> These policies have been shown to reduce alcohol consumption and, as a consequence, should significantly reduce alcohol-attributable harm, including mortality (for recent reviews, see<sup>6,7</sup>).

The three Baltic countries (Estonia, Latvia, and Lithuania) have been an exception in implementing many best buy policies. Between 2000 and 2020, there have been 20 major best buy policies passed, all but one in the recommended direction, i.e., increasing taxation, restricting availability and introducing measure to limit advertising and marketing.<sup>8</sup> The Baltic Alcohol Policy Project and others have been examining the impact of these alcohol control policies.<sup>9</sup> Many of the analyses included Poland as a comparison country, which differs by its low number of best buy policies implemented in the same period: only five major changes, with only two in strengthening the policies.<sup>8</sup> The inclusion of Poland as a comparison is both crucial and justifiable, as all four are neighboring countries that joined the EU in 2004, and are classified as high-income countries by the World Bank.<sup>10</sup> Using this unique constellation of changes in all three WHO best buy alcohol control policies, implemented multiple times at different timepoints during the last two decades in four different countries from the same region, it was possible to perform time-series analyses to evaluate these natural

experiments, using the other countries as controls for secular trends (for design aspects, see<sup>9,11</sup>; for statistical procedures, see<sup>12,13</sup>).

This narrative review aims to summarize the results of all available analyses, highlighting new evidence from the Baltic countries, and provide a better understanding the impact of alcohol control policies than ever before. We have organized the results under six subheadings: (i) impact of alcohol control policies on all-cause mortality; (ii) impact of taxation on mortality inequality; (iii) the role of unrecorded consumption in the implementation of taxation increases; (iv) minimum legal purchasing age and other availability restrictions; (v) the consequences of inaction and weakening the alcohol control system; and (vi) the role of marketing bans.

## Methods

### Search strategy and selection criteria

We searched PubMed from 01.01.2000 to 01.05.2023 using the following search terms: alcohol AND policy AND (mortality OR hospitalizations) AND (Baltic countries OR Poland). This search resulted in a total of 128 articles, of which we kept 24 after excluding all articles which did not include evaluations of the WHO's best buy alcohol control policies (see full list in [Appendix 1](#)). In addition, we screened articles published as part of the publications of the Baltic Alcohol Policy Project.

The final reference list was generated on the basis of methodological rigor and relevance to objectives of this Health Policy Review. It included all alcohol control policies implemented in the Baltic countries and Poland that could be classified as fitting at least one of the WHO's “best buys”, with an emphasis on those that achieved minimum thresholds of strength. These threshold which had been determined in advance (see [Table 1](#) and<sup>8,14</sup>), stipulating the inclusion of only taxation increases which decreased affordability, or trading hour reductions of at least 20%.

Year	Estonia	Latvia	Lithuania	Poland
2000				
2001				<b>June 28:</b> Exemption for beer was introduced into the ban on advertisement
2002		<b>June 14</b> Ban on off-premise sales of alcoholic beverages between 10 p.m. and 8 a.m.		<b>October 1:</b> Reduction in excise taxation by 30%
2003				<b>May 25:</b> Return of beer advertising on billboards; reduction of the ban on advertising on TV, radio, and theatres to 6 a.m. to 8 p.m.
2004	EU membership May 1			
2005				
2006				
2007	Schengen Area regulations were applied from December 21, 2007 on in EE, LV, LT, PL			
2008	<b>January 1 / July 1:</b> Excise tax increases followed by lower affordability <b>July 14:</b> Off-premise sales nationwide prohibited between 10 p.m. and 10 a.m. <b>November 1:</b> Advertising Act—advertising on broadcasting prohibited between 7 a.m. and 9 p.m.		<b>January 1:</b> Excise tax increases followed by lower affordability + other measures <b>January 1:</b> Year of sobriety (Marketing/advertising banned on TV/radio during daytime)	
2009		<b>February 1 / July 1:</b> Excise tax increases followed by lower affordability	<b>January 1:</b> Ban on off-premise sales of alcoholic beverages between 10 p.m. and 8 a.m.	<b>March 1:</b> Excise tax increases followed by lower affordability
2010	<b>January 1:</b> Excise tax increases followed by lower affordability	<b>February 1:</b> Excise tax increases followed by lower affordability		
2011				
2012				
2013		<b>July 19:</b> Outdoor advertising of all alcohol beverages is prohibited		
2014				
2015				
2016	<b>February 1:</b> Excise tax increases followed by lower affordability			
2017	<b>February 1 and July 1:</b> Excise tax increases followed by lower affordability		<b>March 1:</b> Excise tax increases followed by lower affordability	
2018	<b>February 1:</b> Excise tax increases followed by lower affordability <b>June 1:</b> Alcohol Advertising Act: alcohol advertising in broadcasting prohibited between 7 a.m. and 10 p.m. (1 hour longer)		<b>January 1:</b> Retail hours for off-premise sales further reduced 10 a.m. until 8 p.m. on Mondays to Saturdays, and from 10 a.m. to 3 p.m. on Sundays <b>January 1:</b> Full ban of TV, radio, and internet advertisements	
2019	<b>July 1:</b> Reduction in excise taxation by 25%	<b>March 1:</b> Excise tax increases followed by lower affordability		
2020				<b>January 1:</b> Excise tax increases followed by lower affordability

Dates of the implementation are indicated in bold. Green shading refers to taxation increases; blue shading to availability restrictions, grey shading indicates advertising/marketing policies; red shading is used for all loosening of “best buy” policies.

Table 1: Overview of major alcohol control policies affecting price, availability and advertising in the Baltic countries and Poland—2000–2020.

## Results

### Impact of alcohol control policies on all-cause mortality

In their seminal systematic review of taxation increases on mortality and morbidity, Wagenaar and colleagues<sup>15</sup> found no peer-reviewed articles on alcohol taxation increases and all-cause mortality. The effects of taxation increases were deemed to be too small to impact on mortality as a whole. When newer evidence appeared showing the effects of alcohol control policies—mainly fiscal policies—on all-cause mortality and, relatedly, life-expectancy in Russia,<sup>16,17</sup> many researchers argued that the Russian situation presented a unique set of circumstances. In Russia, alcohol-attributable mortality has been linked to large drinking binges lasting days ('zapoily'), and to a large proportion of alcohol being consumed as surrogate (non-beverage) alcohol or unrecorded spirits, including home-made 'samogon'.<sup>18,19</sup> Thus, any effects of Russian alcohol policy measures were not seen as generalizable to other countries or regions, especially countries with different drinking patterns and different levels of wealth.

However, recent analyses from Lithuania showed that reduction of all-cause mortality by increased alcohol taxation was not limited to Russia. Large increases in alcohol excise taxes (more than 100% for beer and wine, and more than 20% for spirits<sup>20</sup>) implemented in 2017 in Lithuania were linked to an immediate reduction of death rates among males, but not females.<sup>21,22</sup> It should be noted that the resulting price increases resulting from the taxation increases were smaller: beer 10–29%, wine 1–57%; spirits 1–14%.<sup>23</sup>

A recent analysis of all 18 taxation and availability changes between 2000 and 2020 above the effect sizes described above in Poland and the Baltic countries showed that on average these measures resulted in a reduction of male age-standardized all-cause mortality rates of 2.31% (95% CI: 0.71%, 3.93%;  $p = 0.0045$ ) per year, and for females in a non-significant reduction of 1.09% (95% CI: -0.02%, 2.20%;  $p = 0.0554$ ) per year.<sup>24</sup> Importantly, the 18 alcohol control measures comprised all taxation increases which had resulted in a reduction of affordability as well as all reductions of trading times in off-premise facilities which were larger than 20%.<sup>8</sup> The effects were measured for the 12 months immediately after each policy change.

That alcohol use was an important driver of these reductions of all-cause mortality was evidenced by a parallel average decrease of adult alcohol *per capita* (15+) consumption of 0.89 litres (ℓ) of pure alcohol (95% CI: -1.32 ℓ, -0.47 ℓ) in the same year when the alcohol control policies were implemented, with no significant differences between countries.<sup>25</sup>

Additional analyses corroborated existing evidence; both increases in alcohol taxation, which reduce affordability, and marked decreases in availability not only affected all-cause mortality but also mortality

within important alcohol-attributable disease categories such as liver cirrhosis,<sup>25</sup> traffic injury,<sup>26</sup> suicide,<sup>27</sup> other injury,<sup>28</sup> circulatory disease,<sup>28</sup> and stroke.<sup>29</sup> In many instances, it was not possible to separate the effects of single policy elements, such as when several policies were enacted at the same timepoint in the same country, or when one marked taxation increase was implemented 15 days before an availability decrease (see Table 1).

### Impact of alcohol taxation increases on mortality inequality

There is scant evidence on the impact of alcohol control policies on mortality inequalities by socioeconomic status.<sup>30</sup> In fact, a systematic search on financial alcohol policies and mortality inequalities from 2022 revealed only two articles, one with direct and one with indirect evidence.<sup>30,31</sup> A Finnish study by Herttua and colleagues<sup>31</sup> with direct evidence on the introduction of minimum unit price (MUP) used data on fully alcohol-attributable deaths and deaths with alcohol as a contributory cause from 1988 to 2007 to investigate the relationship between the MUP of alcohol and quarterly sex-specific mortality rates stratified by education level terciles. The authors found that a 1% increase in the MUP of alcohol was associated with a decrease of 0.03% (95% CI: 0.01, 0.04%) in deaths per 100,000 person-years among Finnish males with lower levels of education, but not among those with the highest levels of education. Among females, increases in the MUP of spirits, intermediate products, and strong beer were significantly associated with a decrease in alcohol-related mortality only among those with secondary education.<sup>31</sup> An earlier study by the same author group found that a decrease in taxation coupled with an increase of availability of cheaper alcohol via cross-border trading with Estonia resulted in increases in alcohol-attributable mortality.<sup>32</sup> The effect was largest among the unemployed or early-age pensioners and those with low education, social class, or income. Finally, a recent analysis of the effects of the introduction of MUP in Scotland using 100% alcohol-attributable deaths found significant reductions in mortality only for the four most deprived deciles of the population,<sup>33</sup> with a similar pattern for hospitalizations for the same disease categories.

All other evidence is indirect<sup>34</sup> or based on simulations or other modelling without direct underlying empirical evidence.<sup>35,36</sup> The modelling studies regarding MUP are a bit more problematic, as: (a) some of the predictions did not correspond to later empirical evidence (e.g.,<sup>37</sup>), and (b) the predictions indicated that MUP would do better than increased taxation without any empirical basis, and to date no such comparative studies have been conducted.

In fact, to date the largest effect of alcohol control policies on mortality inequalities in a country has been found for Lithuania based on the above-mentioned

increase in alcohol excise taxation in 2017.<sup>38</sup> Overall, between 2012 and 2019, during a period of extensive alcohol control policies enactment, absolute education-based inequalities in all-cause mortality in Lithuania declined by 18% among males and by 14% among females. Following the alcohol taxation increase of 2017 alone, the authors found a pronounced, yet temporary, reduction in relative mortality inequalities among Lithuanian males (−13.0%; 95% CI: −3.3, −22.7%). Subsequent decomposition analyses suggested that the reduction in absolute mortality inequalities between lower and higher educated males was mainly driven by narrowing mortality differences between socioeconomic strata in injuries and infectious diseases,<sup>38</sup> both cause-of-death categories causally linked to alcohol consumption.<sup>39</sup>

### The role of unrecorded consumption in the implementation of taxation increases

Unrecorded consumption<sup>40</sup> is often seen as a general impediment to implementing taxation increases for alcoholic beverages.<sup>41</sup> However, recent experiences in Lithuania and other European countries could not find a clear association between increases in excise taxation and increases in unrecorded consumption.<sup>42</sup> Based on a review of such experiences, examples of increases, decreases, and no changes were found to be associated with alcohol taxation increases in the past two decades.<sup>42</sup> The review concluded that unrecorded alcohol consumption did not necessarily increase with increases in taxation and subsequent price increases in registered commercial alcohol. Instead, the level of unrecorded consumption depended on: a) the availability and type of unrecorded alcohol; b) whether such consumption was non-stigmatized; c) the primary population groups which consumed unrecorded alcohol before the policy change; and d) the policy measures taken.<sup>42</sup> These policy measures have been described in detail by Lachenmeier and colleagues.<sup>43</sup>

One goal of The Baltic Project was not only to review the relationship between alcohol taxation and unrecorded consumption (in the Baltic countries, predominantly cross-border shopping), but also to conduct a detailed case study on the level of unrecorded consumption in Lithuania. Using data from the Lithuanian implementation of the European Health Interview Survey in 2019, it was estimated that the unrecorded consumption in Lithuania accounted for 8.3% (95% CI: 7.7%, 8.9%) of the overall alcohol use, or around 1 ℓ of pure alcohol *per capita* consumption. While the recorded consumption was 11.2 ℓ. Using the methodology suggested by Norström,<sup>44</sup> the study modelled how the level of unrecorded consumption changed according to the changes in fully alcohol-attributable mortality (e.g., alcoholic liver disease (K70) and alcohol poisonings (X45)) over the last two decades. The results indicated that the level of unrecorded consumption was at a relatively low level with no marked fluctuations

(Štelemėkas et al., 2023; personal communication). Estimates from a pan-European survey conducted in 2021 corroborated the finding of stable unrecorded alcohol consumption in Lithuania slightly below the European average.<sup>45</sup>

While the level of unrecorded consumption, including cross-border trading, remained relatively stable in Lithuania (Štelemėkas et al., 2023; personal communication), there were much bigger fluctuations in cross-border trading in Estonia and Latvia. Thus, the decrease in adult (15+) domestic *per capita* consumption in Estonia was less pronounced after 2015 because of a compensating effect of a marked increase in the amount of alcohol bought abroad, mainly in Latvia. The cross-border trade in alcohol between Latvia and Estonia increased threefold from 2016 to 2017, as Estonia maintained much higher alcohol retail prices (at least 30% higher for strong alcohol and 50% for beer) than neighbouring Latvia, where stores and warehouses with cheaper prices for alcohol were established directly along the border.<sup>46</sup> This situation resembled the cross-border alcohol trade between Estonia and Finland in 2004 after Estonia joined the EU, when the prices in Estonia had been much lower compared to Finland.<sup>47</sup> In reaction to the influx of cheap alcohol from their southern neighbours via cross-border shopping, the Estonian government adopted a bill of amendments cancelling the alcohol excise duty increases planned for 2019 and 2020. Instead, the new Estonian government, appointed in spring 2019, decided to cut excise tax rates on both light alcohol and spirits by 25% from July 2019 to halt and reverse the cross-border alcohol trade from Latvia. Latvia responded to this with a temporary 15% cut in the price of spirits between August 2019 and February 2020.<sup>48</sup> As a consequence, after years of decline, adult *per capita* consumption in Estonia started to increase again.<sup>25</sup> Cross-border trades have been reduced since, in part because of the COVID-19 pandemic and the resulting travel restrictions.

The overall lesson from the situation in the Baltics and surrounding countries was that, while taxation increases do not necessarily cause an increase in unrecorded consumption, they can do so if there is a sufficiently large gap in retail prices between the domestic and an easy-to-reach foreign market, or a high level of unrecorded consumption before, and no countermeasures in place. Cross-border shopping may become attractive if the price differential is high enough, with substantial effects nationally in the case of small countries such as the Baltic countries. However, instead of competing with one another and thereby facilitating detrimental consequences for public health associated with increases in consumption as well as losses in tax revenues, a preferable solution both for revenue and for protecting health would have been the creation of cross-country treaties aiming to establish a commonly agreed-upon higher taxation level.

### Minimum legal purchasing age and other availability restrictions

Establishing or increasing the minimum legal drinking and/or purchasing age (MLDA) has been classified as one of the best practices in the latest edition of *Alcohol, No Ordinary Commodity*.<sup>6</sup> While such measures will not result in high mortality gains immediately after enactment, in part due to the low mortality rates in adolescence and early adulthood, they seem to impact mortality in the long term. For instance, lowering the MLDA from 21 years to 18 years in Finland in 1969 was associated with higher lifetime alcohol-attributable mortality for those aged 27 to 63.<sup>49,50</sup> But even in the short term, the change in MLDA from 18 to 20 in Lithuania seems to have been associated with small immediate mortality reductions.<sup>51</sup> This finding corroborates similar findings from the US.<sup>52</sup> Notably, these public health gains could be achieved in both countries even when the respective laws were not consistently enforced. Thus, for Lithuania, a recent study showed that in almost 50% of the purchases, age verification was not enforced by supermarkets as required by law.<sup>53</sup>

Availability restrictions in the Baltic states were not only associated with mortality decreases, but also with decreases in hospitalizations and emergency room visits.<sup>54</sup> However, unlike for mortality, this may not change levels of all-cause hospitalizations, as these are influenced by other considerations such as previously unmet hospitalization needs or economic considerations. Thus, any reduction in hospitalizations for particular diagnoses may be replaced by cases with other diagnoses. Clearly, more controlled studies are necessary to corroborate this finding.

### The consequences of inaction and weakening the alcohol control system

In contrast to the Baltic countries, which implemented a number of alcohol control policies between 2000 and 2020, Poland weakened its alcohol control policies over the last few decades, starting before 2000, and continuing over the next two decades (see also [Table 1](#)).<sup>55</sup>

The basis of modern alcohol control in Poland, the Act on Upbringing in Sobriety and Counteracting Alcoholism (1982), imposed a number of obligations on state authorities to take action to reduce alcohol consumption, regulate its availability, and create a framework for building an addiction treatment system.<sup>8,56</sup> It established a centralized, rigorous control system, based on the Scandinavian model of alcohol control policies, comprehensively regulating the issues of prevention, supply, availability, and treatment.<sup>55</sup>

However, by the mid-1980s, the process of dismantling the provisions of the Act and creating legal loopholes had begun in Poland<sup>55</sup> and has continued over the last decades, leading to increased alcohol consumption and mortality.<sup>3,25,57</sup> By the beginning of

the 21st century, many key provisions of the anti-alcohol law were abandoned in practice. In 2002, the excise tax on spirits was reduced by 30% and in 2001 beer restrictions were relaxed and beer advertising returned to television.<sup>58</sup> In 2010, the alcohol industry launched an ongoing marketing campaign (not regulated by the state) leading to a significant increase (by 1.1 billion bottles a year) in sales of small bottles of vodka.<sup>58</sup> Unfortunately, these actions were not counteracted by the state administration, and resulted in an increase in the physical and economic availability of alcohol. Alcohol has become a widely available product in Poland: it can be bought in virtually every grocery store, gas station, or catering outlet, without any restrictions on time of sale. All of this has led to an increase in the level of alcohol consumption and marked increases in attributable mortality, especially alcohol-related cirrhosis, among both males and females of all ages and in all educational groups.<sup>57,59–61</sup>

The Polish example shows that failing to introduce alcohol control policies and the weakening of earlier-introduced, effective strategies for limiting the availability of alcohol, in combination with promotional activities by the alcohol industry, can contribute to a deterioration of population health on a country-wide scale.

### The role of marketing bans

Marketing bans are much harder to evaluate than taxation increases or availability restrictions. Whereas the latter policies have immediate consequences with respect to level of use and harm (see above), marketing bans aim to prevent the efforts of industry and other commercial interests to change cultural perceptions of alcohol use and promote its use more widely and often in a broader range of situations, especially by addressing adolescents and young adults.<sup>62</sup> How can changes in culture be measured on their impact on drinking? Prior attempts to do so are rare and have used different methodologies with contradictory results.<sup>6</sup> The clearest positive result was a sustained 7% reduction in alcohol sales in Norway in the years after a 1975 total ban on advertising was enacted there.<sup>63</sup>

In the Baltic countries, we saw no significant effects on alcohol *per capita* consumption for the first year after implementation,<sup>25</sup> but such an effect would not necessarily be expected. This was despite the fact that the ban was successfully implemented, even in social media.<sup>64</sup> For Poland, the dismantling of advertising bans was part of the overall dismantling of strong alcohol policies, and it is likely that the combined changes contributed to the increase in consumption and harm (see above).<sup>64</sup>

Thus, within the context of alcohol policy in the Baltic countries and Poland, we conclude that such measures seem to be part of the overall policy packages, without being able to quantify their contribution to the success of such policies.



## Discussion

This narrative review of “best buy” alcohol control policies implemented between 2000 and 2020 in the Baltic countries and Poland showed that taxation increases affecting affordability and restrictions in off-premise trading hours were associated with decreases in all-cause and alcohol-attributable mortality. Moreover, absolute mortality inequalities were reduced by a large taxation increase. While taxation increases did not necessarily cause an increase in unrecorded consumption, they could do so if a sufficiently large gap existed in retail prices between the domestic and an easy-to-reach foreign market, or there had been a high level of unrecorded consumption earlier, with no countermeasures put in place. Finally, the dismantling of alcohol control policies was associated with increased alcohol-attributable mortality.

While a number of studies corroborate the main conclusions, we need to point out limitations as well. First, all analyses are ecological. While the original studies strove to introduce many controls such as the ecological trends in neighboring countries at the time of a policy’s introduction, we cannot fully exclude alternative explanations.<sup>11</sup> However, it would be hard to find one or a limited number of alternative explanations for all 18 enactments of alcohol control policies in four countries over two decades. Second, many analyses covered time periods when multiple policies came into effect in the same country (Table 1), hindering attribution of effects to specific policies. Third, the evidence on hospitalizations and impact on the health system is still limited, not only in the Baltic countries. We need a better understanding of the potential substitution of healthcare services when certain services are no longer needed as a result of successful policies on risk factors. However, despite these limitations we can conclude that overall that taxation and availability restrictions worked in the context of the Baltic countries and Poland. Our review thus corroborates the conclusions of Babor et al.,<sup>6</sup> who categorized both policies as “best practices” denoting “policy options [...] found to be superior to any alternatives (p. 316)”.

Most analyses noted that the effect was stronger in males compared to females. Such a sex difference was to be expected, given that in all countries males have a higher prevalence of alcohol consumption, their drinking level is higher, and they show more detrimental drinking patterns.<sup>65</sup> Consequently, they experience more alcohol attributable harm,<sup>2</sup> and are more affected by alcohol control policies. Although we acknowledge that gender, a social construct, is likely to also play a role in the impact of alcohol control policies on various outcomes, the studies discussed above obtained data from either vital or official statistics. Such statistics provide data separated for males and females, and rely solely on biological sex assigned at birth for this classification.

While the impact of alcohol control policies was evident, there is still additional knowledge we need to gain about implementation. The average effects found were often a combination of different policies, implemented at the same time, some below the threshold, and some, such as bans on advertisement, which were intended to work over the longer term. Thus, we need more knowledge on the relative impacts of different combinations of policies in order to optimize their effects. This could be gained by establishing a repository of all studies examining alcohol control policies and their effect on standardized variables such as all-cause mortality and alcohol-attributable mortality.

## Conclusions

The results of the current narrative review clearly demonstrate that implementation of evidence-based alcohol control policies improves public health, and that dismantling them is associated with detrimental public health consequences. The experiences of the Baltic countries and Poland can and should already be used to improve public health in similar countries, in particular in the EU.

### Contributors

JR, MS, CFB, JP, JM, RB, RoRo, RR, and SL secured funding. JR wrote a first draft, and all authors contributed to different parts of the review. All authors agreed on the final version.

### Data sharing statement

This is a narrative review with no original data used.

### Disclaimers

The authors alone are responsible for the views expressed in this publication, and the content does not reflect official positions of NIAAA or the NIH. Carina Ferreira-Borges, Ingrida Zurlytė and Maria Neufeld are staff members of the World Health Organization, but the views expressed herein do not necessarily represent the decisions or the stated policy of the World Health Organization.

### Declaration of interests

The authors except J. Manthey and S. Lange declare no competing interests. J. Manthey declares consulting fees, honoraria and travel support from German and international public health agencies, unrelated to the current manuscript. S. Lange declares funding from the National Institutes of Health for conducting the study; and further funding from the Canadian Institutes of Health Research, and consulting fees from the Pan American Health Organization, unrelated to the current manuscript.

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#### Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.janepe.2023.100704>.

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