

# POLICY REVIEW IN BRIEF: TAXATION OF BEVERAGE ALCOHOL



*This high-level summary reflects the comprehensive assessment of the available evidence on the effect of alcohol taxation policy presented in the attached IARD Policy Review **Taxation of Beverage Alcohol**. It should be considered alongside the full review and not viewed in isolation. All referenced citations refer to the IARD Policy Review.*

Beer, wine, and spirits are highly regulated commodities and subject to taxation wherever they are legally sold. Taxes may be imposed by national, state, or local authorities through value-added tax (VAT), sales or excise tax, and tariffs. Governments can use the taxation of alcohol beverages to generate revenue and encourage consumers to select domestic products over imported products; increasing alcohol prices through taxation may also be intended to reduce consumer demand and, therefore, consumption, harmful drinking, and alcohol-related harm. Taxation is one of the core policy approaches included in WHO's **Global strategy to reduce harmful use of alcohol** and a recommended cost-effective intervention in **Appendix 3** of its *Global action plan for the prevention and control of noncommunicable diseases* and more recent **SAFER** initiative.

## Summary of existing research

**Consumer demand.** Estimates of consumer responsiveness to changes in alcohol beverage prices vary widely [7-12]. It is difficult to generate precise estimates for the broad category of alcohol beverages because it includes many products of different type and quality.

- ▶ Several studies reported that consumers substituted cheaper (and often lower quality) beverages after a price increase, both within and across categories [13, 16-18, 42, 43]. Consumers may also respond to a price increase by purchasing alcohol in jurisdictions where tax rates are lower [28, 29].
- ▶ Several individual studies [12, 35-36] and a review [38] found that moderate drinkers were more responsive to increases in taxation than either light or heavy drinkers. Although some systematic reviews found that increased pricing and taxation reduced drinking among heavy and high-risk drinkers [30, 39], other studies [13, 27, 36, 41] and two systematic reviews [34, 40] found heavy drinkers to be less responsive.
- ▶ Some studies found that young people adjust their drinking [30, 34, 42, 60, 61, 63] and binge drinking [62, 63] more than older adults do in response to pricing policies. A systematic review reported that, like adults, young heavy drinkers were less responsive to pricing than light drinkers [34].

**Alcohol-related harm.** Some studies have found reductions in crime and violence [30, 39, 45, 51] associated with increases in alcohol taxes or prices, but other studies have reported no effect [39, 46-47, 51]. Similarly, for liver cirrhosis mortality [30, 37, 38] and drink driving and road-traffic fatalities, [39, 47] some studies found an effect, and others yielded null results.

**Unintended consequences.** Unrecorded alcohol (including home-produced alcohol, illicitly made and traded beverages, and surrogate alcohol) is untaxed, and represents a cheaper alternative to legal products [19, 23]. This difference in price has been cited as one of the main drivers of unrecorded-alcohol consumption in studies among vulnerable and dependent populations in high-income countries [88, 90].

- ▶ Studies have reported growth in the unregulated alcohol market as an unintended consequence of price increases [21-25, 28, 85-89, 91, 92], and decreases in illicit "moonshine" following price decreases of regulated beverages [94].

**Other considerations.** The effectiveness of taxation policies for reducing harmful drinking depends on the national context [6]. In Europe, social, demographic, and economic factors have been found to be more directly related to changes in alcohol consumption and related outcomes than regulatory policies, including taxation [74]. There are few studies assessing their effectiveness in low- and middle-income countries [104].

# TAXATION OF BEVERAGE ALCOHOL



IARD Policy Reviews cover the evidence on the impact of policy measures on drinking patterns and outcomes. They offer an overview of the key literature and provide the reader with an extensive bibliography that refers to original research on each topic. The Reviews attempt to present the balance of the available evidence. They do not necessarily reflect the views of IARD or its sponsoring companies.

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## Background

**Beer, wine, and distilled spirits are highly regulated commodities.**

Pricing policies, notably through taxation, are among the various regulations applied to alcohol beverages in almost every country where their sale is legal. Taxation may be imposed by national, state, or local authorities, and can include value-added tax (VAT), sales tax, excise tax, and tariffs <sup>[1]</sup>. This review mainly discusses excise taxation on alcohol beverages.

**Taxation of alcohol beverages is used to generate revenue for governments.**

- ▶ Income generated in this way can be considerable.
- ▶ In the United Kingdom in 2015, beverage alcohol excise taxes accounted for 3.1% (USD \$12 billion) of government revenue <sup>[1]</sup>.
- ▶ In South Africa, 1.7% (\$1.5 billion) of government revenue was attributed to alcohol beverage excise taxes during 2015 <sup>[1]</sup>.
- ▶ In Finland in 2015, government revenue from alcohol beverage excise taxes amounted to 4.6% of all tax revenue (\$1.5 billion) <sup>[1]</sup>.

- ▶ In the United States in 2015, excise paid on alcohol beverages amounted to \$9.64 billion or 9.8% of all excise revenue <sup>[2]</sup>.

**Taxation can also be used for trade purposes.**

- ▶ Taxes and tariffs can be applied to create trade barriers and encourage the purchase of domestic products <sup>[3, 4]</sup>.

**A public health rationale has been cited by some for the use of alcohol taxation as a policy lever.**

- ▶ Increases in price are achieved through the levying of taxes (usually excise taxes) on alcohol with the aim of reducing alcohol consumption, misuse, and related harms <sup>[5]</sup>.

**As taxation relates to revenue, trade, and public health, it is viewed as an integral part of a wider regulatory framework around alcohol.**

According to the WHO, taxation is best used to reduce harmful drinking patterns in conjunction with other interventions and tailored to local conditions and context [6]. Key considerations relate to:

- ▷ where to set taxation levels to avoid unintended market shifts and outcomes;
- ▷ relationships with social and economic factors that influence alcohol consumption and misuse;
- ▷ differential effects of pricing policies on consumer groups and drinking patterns; and
- ▷ efficacy in markets where regulatory enforcement is poor, or the unrecorded market share is large.



## Summary of the Evidence

### ALCOHOL TAXATION AND CONSUMER DEMAND

**Taxation of alcohol beverages is often implemented as a policy measure aimed at reducing alcohol-related harm.**

Some proponents of taxation as a policy measure have suggested that increasing the price of alcohol will reduce consumer demand, thereby reducing levels of consumption, harmful drinking, and alcohol-related harm <sup>[5]</sup>.

**While consumer responsiveness to changes in price is a basic principle of economics, this relationship is not as clear for alcohol beverages as it is for some other commodities that have less variation by type, price, and quality** <sup>[7]</sup>.

Substantial variation has been found in the responsiveness of demand to price changes <sup>[7-12]</sup>.

- ▶ Heterogeneity among beverages has been implicated in the differential responses to taxation <sup>[13-15]</sup>.
- ▶ Substitution of one beverage category for another has been reported following price increases, from a more expensive category to cheaper ones <sup>[16, 17]</sup>.
- ▶ Within a single category, substitution may include replacing more expensive beverages with cheaper ones of the same type, often at the expense of quality <sup>[13, 17, 18]</sup>.
- ▶ Unrecorded alcohol (including home-produced, illicitly made or traded, and surrogate alcohol) is untaxed. Therefore, in many countries, it represents a cheaper alternative to highly taxed and legally available beverages <sup>[19-25]</sup>.
- ▶ Another form of substitution involves shifting from drinking on-premise to off-premise consumption, such as that which takes place in the home and is generally less expensive for the consumer <sup>[26]</sup>.
- ▶ Consumers may also choose to purchase alcohol beverages in bulk at discount rates to offset increases in price <sup>[27]</sup>, and to purchase alcohol in neighbouring countries or jurisdictions in order to avoid local taxes <sup>[19, 28, 29]</sup>.

## CONSUMPTION, PATTERNS AND OUTCOMES

**Numerous individual studies, systematic reviews, and meta-analyses have examined the complex relationship between taxation and consumption patterns and drinking outcomes.**

- ▶ A systematic review of individual studies found a correlation between increased taxation of beverage alcohol and decreased consumption at the aggregate population level <sup>[30]</sup>. Some meta-analyses have shown a similar relationship, as well as a reduction in the aggregate consumption of individual beverage types <sup>[9, 18, 31, 32]</sup>.
- ▶ Some evidence suggests that reductions in excise tax may be correlated with an increase in aggregate consumption <sup>[33]</sup>.

**However, the evidence about the impact of taxation is varied, as drinkers respond differently to increases in taxation and changes in the price of alcohol, depending on their drinking patterns.**

- ▶ The relationship between price and drinking outcomes is complex and has been found to vary according to drinking patterns in a systematic review <sup>[34]</sup>, as well as in individual modelling studies <sup>[35, 36]</sup> and empirical studies <sup>[13, 37]</sup>.
- ▶ Moderate drinkers have been found to be more responsive to increases in taxation than light and heavy drinkers in individual modelling studies <sup>[35, 36]</sup> and an empirical study <sup>[12]</sup>, as well as in a review of the literature <sup>[38]</sup>.

- ▶ Some systematic reviews have reported a correlation between increased pricing and taxation and reductions in heavy and other high-risk drinking patterns <sup>[30, 39]</sup>.
- ▷ However, some modelling <sup>[27, 36]</sup> and empirical studies <sup>[13]</sup> have found the effect of taxation on heavy drinking to be smaller than on overall drinking levels, suggesting that heavy drinkers are less responsive to taxation than moderate and light drinkers.
- ▶ Other systematic reviews have found that heavy and frequent drinkers (both male and female) are relatively unresponsive to price <sup>[34, 40]</sup>.
- ▶ A systematic review <sup>[40]</sup> and a modelling study <sup>[41]</sup> also found that price has little impact on heavy episodic drinking among both adults and young people.
- ▶ There is evidence from a modelling study <sup>[27]</sup>, a review of the literature <sup>[42]</sup>, and a survey among dependent drinkers <sup>[43]</sup> that heavy drinkers do not respond to price increases by reducing their consumption, but are most likely to choose cheaper beverages and to trade down in price (and often in quality) when taxes are raised.

**The evidence on the impact of taxation policies on alcohol-related harm is varied and depends on the particular outcomes measured.**

- ▶ Some studies of the impact of increased taxes on violence and crime have reported an inverse correlation <sup>[30, 39, 44, 45]</sup>, while others have shown no evidence of a relationship <sup>[46-50]</sup>, notably with intimate partner violence <sup>[46, 51]</sup>.
- ▶ Findings on the impact of tax policies on liver cirrhosis mortality are mixed <sup>[38]</sup>. Studies looking at a reduction in taxes in the Nordic countries found that it was associated with a rise in liver disease mortality in Finland <sup>[33]</sup> but not in Denmark or Sweden <sup>[37]</sup>. In a study in the US a significant positive association was found only for increased taxes on spirits, but not for those on beer <sup>[52]</sup>.
- ▶ In the United States, some studies have found that higher taxes are associated with reductions in traffic fatalities <sup>[11, 53-55]</sup>. However subsequent studies suggest that this relationship does not hold up in further analysis <sup>[56-59]</sup>.
- ▶ A global review of the effects of alcohol taxes on drink driving found mostly null results from studies in five settings (Russia, Finland, Sweden, Denmark, USA, and Hong Kong) <sup>[47]</sup>.

**Taxation has also been studied as a tool for reducing consumption and harmful drinking among young people.**

- ▶ Young people's drinking <sup>[30, 34, 42, 60, 61]</sup> has been found to be responsive to price and tax increases, perhaps more so than drinking by adults <sup>[64]</sup>.
- ▶ While individual studies have shown that binge or heavy episodic drinking <sup>[62, 63]</sup> by young people may be responsive to pricing, a systematic review of the evidence suggests that young people who are heavy drinkers may be less responsive to price than those who are light drinkers, similar to results found among adults <sup>[34]</sup>.
- ▶ The evidence also suggests that the price of alcohol is more likely to affect drinking participation by young and adult women than that by either young or adult men <sup>[34, 61]</sup>.

- ▶ One explanation offered for greater responsiveness by young people to pricing policies is limited disposable resources [61] among those who purchase their own alcohol beverages.
- ▶ However, young people may also access alcohol in ways other than purchasing it themselves [65-68], which could counteract the potential impact of pricing policies.

**Taxation to reduce harmful drinking has been assessed to be cost-effective by the WHO and has been proposed as a policy “best buy” for governments [69].**

- ▶ However, the WHO states that the effectiveness of taxation and other pricing policies for reducing harmful drinking depends on the national context [6]. Particularly in countries where a large share of the alcohol market is unrecorded, increased taxation of the regulated alcohol sector may not significantly reduce harmful drinking [28, 70].
- ▶ The World Health Organization’s methodology for appraising cost-effectiveness, WHO-CHOICE, acknowledges several limitations:
  - ▶ The applicability of cost-effectiveness analysis results varies across different countries and local contexts due to data issues, capacity constraints, local preferences or systemic barriers to implementation [71].
  - ▶ Most of the evidence to support cost-effectiveness assessments comes from high income countries and much less is known about the impact of these interventions in lower and middle-income countries [71, 72].
  - ▶ The uncertainty around estimates of cost-effectiveness at the country level, rather than regionally or globally, means that it is sometimes not possible to be sure that one intervention is more effective than another [71].
  - ▶ Benefits associated with tax increases (in the form of averted costs to the government) can accrue over a long time-frame, whereas the costs of the tax are borne by consumers immediately [73].
- ▶ The WHO suggest that taxation is not equally useful in all circumstances, nor can it be applied as a stand-alone tool to reduce harmful drinking [6].

## THE INFLUENCE OF SOCIAL, DEMOGRAPHIC, AND ECONOMIC FACTORS

**Empirical evidence suggests that broader social, demographic, and economic factors may play a more significant role in shaping drinking patterns than regulatory measures, including taxation and pricing policies.**

- ▶ An extensive analysis of the effects of alcohol policy measures and socio-demographic and economic variables was conducted on data covering nearly 50 years in 12 European countries. The results of this work show that at the regional, sub regional, and national level, the impact of individual measures was highly variable, but that pricing policies were among those least associated with changes in either alcohol consumption or indicators of harm at the European level [74].

- ▶ Socio-demographic and economic factors were more strongly correlated with alcohol consumption and harm than were regulatory measures <sup>[74]</sup>.
- ▶ These findings correspond with earlier reports <sup>[29, 37, 49, 75, 76]</sup> that taxation rates are not always correlated with predicted increases or decreases in either consumption or alcohol-related harm.
- ▶ Studies show that demand for alcohol is also affected by income levels <sup>[9, 37, 77, 78]</sup>. Some studies show that the impact of income changes is larger than the impact of price changes on consumption <sup>[17]</sup>. Rising incomes may therefore offset price changes that result from taxation increases.

**Alcohol taxation has been shown to be regressive and may disproportionately affect the economically disadvantaged.**

- ▶ The relationship between disposable income and taxation of alcohol has also been discussed in relation to its impact on different groups. Disproportionate taxation may penalize moderate drinkers and those with limited disposable income <sup>[35, 36]</sup>.
- ▶ Reductions in consumption among non-harmful drinkers as a result of a tax increase, referred to in economics as a loss in consumer surplus, can create economic inefficiency in alcohol markets and reduce government tax revenues <sup>[79, 80]</sup>.
- ▶ Evidence from individual studies shows that alcohol taxes are generally regressive, though the extent depends on other national-level factors <sup>[81-84]</sup>.
- ▶ However, there is a relationship between lower-income segments of society and the consumption of untaxed unrecorded alcohol, including surrogate alcohol, reflecting the inability to afford taxed (and higher-quality) beverages <sup>[85-89]</sup>.

## UNINTENDED CONSEQUENCES

**Taxation and other pricing policies can lead to unintended outcomes, including losses of government revenue instead of gains and potential health effects of unrecorded alcohol.**

- ▶ Price is one of the major drivers of consumption of unrecorded alcohol <sup>[88, 90]</sup>, and high taxes on regulated and branded products can drive trade in unregulated alcohol and growth of the grey or black markets <sup>[19, 21, 23-25, 28, 85, 91, 92]</sup>.
  - ▶ Cheap and potentially harmful alternatives to commercial products can include non-potable surrogate alcohols (e.g., medicinal compounds, automobile products, and cosmetics) or drinks that are mixed with them <sup>[24, 88, 93]</sup>.
  - ▶ In many countries alcohol used for industrial purposes and not intended for consumption is exempt from excise tax. Industrial alcohol may be denatured by the addition of methanol and other substances and its use in illegal production of unrecorded alcohol products has severe reported health outcomes <sup>[85]</sup>.
  - ▶ Pricing policies can decrease the consumption of some types of unrecorded alcohol; for example, price liberalization in Sweden was associated with a reduction in the estimated consumption of homemade spirits five-fold <sup>[94]</sup>.

- ▶ Unrecorded alcohol consumption is also affected by socio-economic factors <sup>[25, 86, 95]</sup>.
- ▶ Interventions to close loopholes for producers, distributors, and sellers of unrecorded alcohol are called for by researchers to ensure that policies on the regulated market are effective <sup>[96]</sup>.
- ▶ Disproportionate taxes may also lead to tax evasion and corruption, illicit trade, and a resulting loss, rather than an increase, in government revenue <sup>[19, 29, 37, 64, 94, 97]</sup>.
- ▶ Substantial cross-border trade has also been reported between jurisdictions with significantly different taxation rates and pricing policies <sup>[19, 28, 29, 37, 64, 94, 97-99]</sup>.



## Limitations and methodological issues

Certain limitations should be taken into account with respect to the available evidence on the utility of taxation policies as public health tools.

**The evidence pointing to the effectiveness of taxation policies to reduce harmful drinking is increasingly being challenged by new studies that offer a more nuanced analysis of the complex relationships.**

- ▶ Earlier work around the impact of taxation relies largely on aggregate consumption measures, such as per capita consumption and population-based indicators, obscuring the variations in impact within populations and across drinking patterns <sup>[34, 35, 100, 101]</sup>.
- ▶ In addition, a recent meta-analysis that controls for outliers and publication bias suggests that responsiveness to price increases is smaller than previously reported <sup>[17]</sup>.

**Taxation as a policy tool has been studied mainly in developed countries. In particular those in Northern Europe, North America, Australia, and New Zealand. Its utility in developing countries is largely unstudied.**

- ▶ Developing countries have distinct drinking patterns, including larger proportions of abstainers and lower prevalence of heavy drinking than developed countries, also suggesting a more limited impact of taxation policies <sup>[102, 103]</sup>.
- ▶ A recent systematic review concluded that there are currently no studies examining the effectiveness of taxation to reduce harms in the poorest countries (lower and lower-middle income) <sup>[104]</sup>.

- ▶ Wide availability of cheap unrecorded alcohol in many developing countries also poses a significant challenge to taxation as a measure for limiting consumption <sup>[23]</sup>. The effectiveness of control policies, including taxation, relies on adequate enforcement <sup>[6, 103, 105]</sup>. The enforcement of regulatory measures is often limited in developing countries, and the impact of such measures may also be more limited <sup>[7, 70, 103, 105]</sup>.
- ▶ **Much of the evidence for taxation as a health policy tool is based on predictive models and projections of outcomes, and less often on empirical evidence.**
- ▶ Much of the literature relies on predictive studies of the estimated impact of changing taxation and price of alcohol on consumption per capita and other indicators of harm (e.g., road traffic crashes, liver cirrhosis, suicide, violence) <sup>[12, 44, 94, 106, 107]</sup>.
- ▶ Recent empirical studies show that the relationship is less predictable and considerably more complex than previously assumed <sup>[29, 37, 49, 74]</sup>.

**Changes in consumption following policy measures may be the result of broader, long-term trends and may occur independently of the introduction or removal of taxation (or other) policies.**

- ▶ Following the reform of taxation on spirits in Switzerland in 1999, there was a 30–50% reduction in the retail price of imported products. Survey research indicated an immediate nearly 30% increase in spirits consumption, while total consumption across beverage types remained the same <sup>[108]</sup>.
- ▶ The institution of a tax on alcopops in Germany in 2004 resulted in a decline in consumption of these types of products; however, a similar decline was observed in Austria without the institution of a tax <sup>[109]</sup>.
- ▶ There has been a steady decline in alcohol consumption in many European countries over the past 30 years, which has occurred independently of taxation policies <sup>[74, 100]</sup>.

**Assessments of consumer responses to taxation depend on the methodology used and are influenced by additional factors <sup>[110, 111]</sup>.**

- ▶ For example, the magnitude of the effect of changes in price depends on whether individual- or aggregate-level data are used <sup>[8, 9, 12, 112, 113]</sup>.
- ▶ Systematic reviews and meta-analyses are shaped by the quality of the underlying studies they consider. Several methodological issues may obscure study findings, if not taken into account, including <sup>[10, 17, 31, 113, 114]</sup>:
  - ▷ publication bias, or preference given by journals to studies that found significant results over those that did not find a relationship between the studied policy and outcomes. Over time, publication bias time adds up to the published literature capturing a partial overview of the evidence that unduly emphasizes that relationship;
  - ▷ heterogeneity of effect sizes; and
  - ▷ outliers.

**Interpretation of the impact of taxation on consumption and outcomes needs to take into account other policy and prevention measures that may have been implemented concurrently.**

- ▶ Policies are often not introduced in isolation; tax increases may be accompanied by other alcohol control policies such as restricting youth access, refusing sales to intoxicated persons, restricting advertising, and targeting drink-driving, making it difficult to disaggregate the effect of each policy [115, 116].



## Glossary

### Taxation

- ▶ **Excise tax:** a tax on a specific product or category of products collected at the time of sale; excise taxes are typically included in the prices communicated to consumers as they are levied on the producer of the good, who may or may not choose to pass it on to the consumer.
- ▶ **Value-added tax (VAT):** a tax collected at each sale along the supply chain, which is increasingly higher as value is added along the chain from raw materials to final products; whether or not VAT is included in the prices communicated to consumers varies by country.
- ▶ **Tariff:** a tax or levy applied to a category of products that are imported or exported, collected when the products are clearing customs.

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