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► [Effects of alcohol tax and price policies on morbidity and mortality: a systematic review.](#)

Wagenaar A.C., Tobler A.L., Komro K.A.
American Journal of Public Health: 2010, 100(11), p. 2270–2278.

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For what seems the first time, this analysis combined results from relevant studies to test whether low tax/price levels on alcohol result in poorer health and higher death rates. It found the expected relationships, but based on only the partial accounting of the harms and benefits of drinking found in most studies.

SUMMARY There are well established links between low tax/price on alcohol and heavier drinking, and in turn between heavier drinking across a population and poorer health and elevated death rates. The implication is that there will also be a relationship between the two ends of this chain, such that lower tax/price levels are associated with poorer health and elevated death rates. The featured analysis tested this expectation by combining the results of [relevant studies](#) using [meta-analytic](#) techniques. However, variation in the design of the individual studies meant that [certain assumptions](#) underlying the ability to combine their results were violated, so the analysts also reported descriptive summaries of the studies such as how many found the expected relationships, and how many of these were statistically significant. Another way the variation in studies was catered for was to group the diverse outcome measures in to [eight](#) conceptually distinct categories and to calculate the magnitude of the relationship ([effect size](#)) for each outcome in each individual study.

Fifty papers were found documenting 340 observations of the relationship of alcohol taxes or prices to mortality, health or other adverse impacts. Across all studies and all outcomes, there was a statistically significant but [small](#) inverse relationship, such that higher [prices and taxes](#) were associated with improvements in health, mortality and other adverse impacts.

Among the studies were 13 which recorded alcohol-related disease or injury such as deaths from cirrhosis. Across these there was a relatively (compared to all studies) strong (effect size -0.347) and statistically significant inverse relationship with prices/taxes. Every study found such a relationship and in all but two it was statistically significant. Among the other studies was [one which found](#) that US state alcohol taxes were inversely but weakly related to deaths overall to a degree which narrowly missed the conventional cut-off for statistical significance.

The [largest](#) group of papers dealt with traffic safety, including drink-driving, alcohol-related deaths, and crash fatalities overall. Across these there was a weak (effect size -0.112) but statistically significant relationship with tax/price in the expected direction. All the studies found at least some inverse relationships and most were statistically significant.

Remaining categories of outcomes were addressed by fewer than ten papers each. In respect of violence, suicide, indicators of crime and misbehaviour, and sexual risk or disease, in each case the pooled relationship across relevant studies was weak but (except for suicide) statistically significant. Two papers documented an inverse relationship between alcohol tax/price and smoking and cannabis use respectively. Though neither alone was statistically significant, the pooled relationship was.

The authors' conclusions

Aggregated results from this fairly large set of studies establish beyond reasonable doubt that alcohol taxes and prices are inversely associated with health across a population. Consistently for each outcome category, the relationship was in the expected direction and (except for suicide) statistically significant. There were, however, substantial variations in the strength of the relationship. Not surprisingly, the strongest relationship was with deaths and illness of the kind known to be largely due to drinking. For other outcome categories, drinking is only one factor among many, and the relationship was progressively weaker the less central alcohol was to causing the outcome.

These findings can be placed alongside those of a [another meta-analysis](#) which [found that](#) as alcohol price/tax rose, alcohol consumption fell, a strong inverse relationship. Together these results suggest that price and tax affect health, mortality and other adverse impacts by affecting overall consumption of alcohol. Though for some types of outcomes the relationship was weak, across an entire population the potential impact of varying tax/price is substantial. The findings imply that doubling alcohol taxes would on average reduce alcohol-related mortality by 35%, traffic crash deaths by 11%, sexually transmitted diseases by 6%, violence by 2%, and crime by 1.2%. In most developed countries, alcohol is second only to tobacco as a consumer product which causes death, hence the clear public health significance of the findings. Moreover, unlike many prevention efforts, the mechanisms for taxing alcohol are already in place, and the large public health benefits not only accrue without requiring additional fiscal resources, but actually generate additional revenue.

FINDINGS COMMENTARY The total cost to the UK economy of alcohol-related death, illness, crime and other adverse impacts [has been estimated](#) at up to £25.1 billion a year. In Britain one in ten disability adjusted life years [are lost](#) to alcohol. In recent years Britain has woken up to the scale of the problem and political attention has turned to what promises to be the most feasible and, at a level of the entire population, most effective antidote – price rises imposed either through taxation or by setting a minimum per unit price for alcohol.

Modelling exercises for both [England](#) and [Scotland](#) have calculated the scale of the potential savings in lives, ill health, crime and other social costs. These analyses joined the link from price to consumption to the one between consumption and adverse consequences, constructing an indirect estimate of how much a given price rise would benefit the population. Instead the featured analysis aggregated results from studies which directly observed the relationship between price/tax and adverse consequences – in principle, the most reliable basis for assessing the potential impact of tax or price changes. In practice, much depends on the adequacy with which the incorporated studies excluded [other possible explanations](#) for an apparent link between price/tax and negative consequences.

It is also the case that (because of the studies it had available to draw on) the featured analysis is a partial accounting of negative and positive impacts related to drinking levels as influenced by tax and price. Most studies incorporated in the analysis related tax/price to short-term consequences like traffic fatalities or to cases of cirrhosis, in which drinking is clearly a major factor, or to explicitly alcohol-related mortality. But alcohol contributes to many chronic diseases not generally accounted for in the studies. Together [in Ireland](#) these were estimated to have been responsible for over two-thirds of all alcohol-attributable deaths. On the other

hand, light drinking actually helps prevent [some other conditions](#), notably a form of heart disease. Taking these in to account, the issue then becomes not what is the gross harm from a certain level of drinking encouraged by a certain price policy, but what is the *net* harm (if any) after the benefits have also been taken in to account. Largely because of reductions in the very large number of deaths due to heart disease, compared to not drinking at all, some drinking is [actually related](#) to a lower death rate at the individual level. In Europe the lowest mortality is associated with very light drinking (under a drink a day) for women and light drinking (one or two drinks a day) for men, but for men mortality rates remain lower than in non-drinkers up to 65mg alcohol a day, equivalent to eight UK units. Some of this apparent effect will be due to factors other than a real protective effect of drinking, but some real effect is likely to remain up to several units a day for men. It remains the case however that maximum benefit is associated with light or very light drinking below this level. If tax rises push light-moderate drinkers down this curve from several units a day to one or two there should be life-extending benefits.

Just [one of the studies](#) incorporated in the featured analysis was capable of addressing net harm/benefit, because it related tax to *overall* mortality, whatever the cause. It found that US state alcohol taxes were inversely but weakly related to deaths overall but not with sufficient strength or consistency to [eliminate the possibility](#) that the relationship was due to chance rather than to a real link with tax levels. Beneficial effects of moderate drinking in middle age (largely in respect of heart disease) were more than counter-balanced by adverse effects of heavier drinking and acute deaths in younger groups.

Beyond health impacts are the social and psychological benefits drinkers feel they get (the reason why they are prepared to pay) from drinking. An industry-funded [review](#) found that moderate drinkers "experience a sense of psychological, physical, and social well-being; elevated mood; reduced stress (under some circumstances); reduced psychopathology, particularly depression; enhanced sociability and social participation; and higher incomes and less work absence or disability". In particular, British society generally values drinking and social activities based on drinking. To the extent that price rises impede these activities, some things people value are lost, even if other things they value (eg, health) improve. When the UK Home Office [valued the costs and benefits](#) of minimum per unit pricing, they accepted that drinkers gain benefits from their drinking and that to a degree these will be countered or eroded as drinkers are forced to pay more for these benefits and/or forgo them. There will be some countervailing gains for the alcohol industry, but the result would, it was said, be a "decrease in net social welfare". These losses but also the benefits of price rises and the financial burden of more expensive drink (when prices rise drinkers do not generally cut back sufficiently to avoid spending more) may be felt most acutely by the poorest in society.

Just as with the adverse effects of drinking, supposed benefits may not be caused by moderate drinking, but a spurious link due to some other factor which affects both drinking and death rates, or a reverse relationship such that, for example, people who are well paid drink more because they can afford it rather than drinking being a cause (eg, via social links) of higher income. The review cited above admits that "It is as yet impossible to determine to what extent moderate alcohol consumption causes positive psychological outcomes and to what extent it is part of a complex pattern of mutually reinforcing variables". However, for several physical conditions, both on both the plus and the minus side, the reality of alcohol's impacts on the body [has been convincingly established](#).

Another methodological concern acknowledged by the authors is that variation in study designs and measures violated the statistical assumptions behind calculating a pooled estimate of the strength of the relationship between tax/price and adverse consequences; the studies were simply too different to be reliably pooled as if they were all trying to measure the same thing in the same way. This same problem led [other analysts](#) to abandon any attempt to calculate a pooled effect on alcohol-related harms. The fallback position adopted in the featured study of simply tallying the number of findings in the 'right' direction and how many were statistically significant resurrects the shortcomings which meta-analytic pooling of results is intended to overcome, and leaves open the question of why in many cases outcomes were *not* significantly related to tax or price.

Despite these considerations, it seems highly likely that purely in health terms, raising the price of alcohol in Britain will bring substantial benefits, the verdict reached by Britain's National Institute for Health and Clinical Excellence [when it assessed](#) the likely consequences of setting a minimum price per unit of alcohol. However, there remains [the issue](#) of whether governments mindful of the opinions of the drinking public and the importance of drink-related industries will raise alcohol taxes/prices sufficiently to realise the potential public health gains. This is especially the case in Britain, which [compared to other European nations](#) already has among the highest alcohol taxes, and where drink prices are relatively high compared to other commodities.

See this [Findings hot topic](#) for policy developments in the UK. At the time of writing the Scottish government has passed but due to legal challenges not yet been able to implement a law enabling it to set a minimum price per unit of alcohol. For England and Wales the UK coalition government was committed to a similar policy but backtracked to a ban on the sale of alcohol below the cost of duty plus VAT, estimated to have very minor effects on overall consumption or on health.

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