


## analysis

This entry is our analysis of a review or synthesis of research findings considered particularly relevant to improving outcomes from drug or alcohol interventions in the UK. The original review was not published by Findings; click [Title](#) to order a copy. Free reprints may be available from the authors – click [prepared e-mail](#). [Links](#) to other documents. [Hover over](#) for notes. [Click to](#) highlight passage referred to. [Unfold extra text](#)  The Summary conveys the findings and views expressed in the review. Below is a commentary from Drug and Alcohol Findings.

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### ▶ Evidence for the effectiveness of minimum pricing of alcohol: a systematic review and assessment using the Bradford Hill criteria for causality.

**Boniface S., Scannell J.W., Marlow S.**  
**BMJ Open: 2017, 7(e013497).**

Unable to obtain a copy by clicking title? Try asking the author for a reprint by adapting this [prepared e-mail](#) or by writing to Dr Boniface at [sadie.boniface@kcl.ac.uk](mailto:sadie.boniface@kcl.ac.uk).

*Unable to draw on evidence from 'gold standard' randomised controlled trials, this review used nine criteria to assess the effect of minimum unit pricing – finding on balance that setting a minimum price per unit of alcohol was likely to reduce alcohol consumption and alcohol-related harms.*

**SUMMARY** Minimum unit pricing is one of many policies and programmes aiming to reduce the harms of alcohol, the most notable application of it in Canada where a variety of types of minimum pricing are in operation.

In light of ongoing consideration of minimum unit pricing in the UK ([unfold !\[\]\(b4eeff342f60cc7bcd67d869b4fedca2\_img.jpg\) supplementary text](#) for the status of discussions at the time the article was written and published; see Commentary below for further developments), this paper reviewed the evidence for price-based alcohol policy interventions to determine whether minimum unit pricing is likely to be effective.

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In 2012, the UK coalition government [cited support](#) for minimum unit pricing in its alcohol strategy, and legislation to have a minimum price of £0.50 per unit was [passed](#) in Scotland the same year. In Scotland, the Scotch Whisky Association challenged the 2012 legislation in the Scottish Court of Session, [which referred](#) the case to the Court of Justice of the European Union in 2014. In late 2015, the case was referred back to the Scottish courts to [investigate](#) whether the same objective could be met through increased taxation, which could have implications for other EU countries considering minimum unit pricing. In late 2016, the Scottish Court of Session [ruled that](#) minimum unit pricing does not contravene EU law, however, the Scotch Whisky Association then [appealed](#) to the UK Supreme Court.

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Of 517 studies identified, 33 studies were assessed – 26 peer-reviewed research studies, and seven from 'grey' literature (non-academic sources, such as organisations and governments). No randomised controlled trials testing the outcomes of minimum pricing or price-based interventions were found.



#### Key points From summary and commentary

This paper reviewed evidence for price-based alcohol policy interventions to determine whether minimum unit pricing would likely be effective in reducing alcohol consumption and alcohol-related harms.

The conclusion was that it is highly probable, but not certain, that introducing minimum unit pricing for alcohol would have the desired impact.

However, questions remain unanswered about minimum unit pricing. Scotland implementing the policy would give further scope to test its effectiveness.

Nine criteria proposed by Sir Austin Bradford Hill in 1965 [see [original paper](#)], and subsequently referred to as the 'Bradford Hill criteria', provided the framework for assessing the impact of the interventions in this review. [What each criterion means is described below.]

## Main findings

### Criteria one: Strength of the association

*Whether there is a statistically significant improvement in level of alcohol consumption or alcohol-related harms.*

Overall, there was reasonably good support for this criterion, but not from grey literature. Studies in Canada found that 10% increases in minimum prices were associated with reductions in alcohol consumption of 3.4–8.4%, in alcohol-attributable hospital admissions of 9%, and in alcohol-related mortality of 32% – each statistically significant. Observational studies in the UK, Ireland, Australia and one trial from the US found statistically significant associations between cheaper alcohol and heavier drinking. The magnitude of the association varied across these studies, and due to different study measures and outcomes, the results were not all comparable.

### Criteria two: Consistency

*Whether different studies conducted in different locations, in different populations, by different investigators, and at different times reported similar findings.*

Support for the consistency criterion was very strong. Inverse associations between alcohol pricing and alcohol consumption or harm have been documented in countries in Europe, North America and Australia.

### Criteria three: Specificity

*If pricing was the only reason that alcohol consumption or alcohol-related harm could have fallen.*

Support for the specificity criteria was very strong. Many of the reviewed studies which assessed real-world changes in price and drink-related outcomes statistically adjusted for other influences, but the best support for the specificity criterion came from 'modelling' studies. Rather than observing real-world changes, these aimed to predict changes using mathematical models free from the extraneous influences which confuse observational studies. The [Sheffield Alcohol Policy Model](#) [see [website](#)] is one such model and has been applied in England Scotland and Canada and provided very strong support for the specificity criterion. Further support was provided by other different modelling studies in the UK and Australia and a (non-randomised) trial in the US.

### Criteria four: Temporality

*Attributing or associating a change in alcohol consumption or harm to a pricing intervention, only when an intervention takes place before the change is observed.*

Overall, there was very strong support for the temporality criterion. Strong support for this criterion came from research following the introduction of minimum unit pricing in Canada, where minimum price increases preceded reductions in alcohol consumption, alcohol-attributable hospital admissions and alcohol-related mortality. Studies where price changes preceded the expected changes in alcohol consumption or harm were also conducted in Russia, Poland and Finland.

### Criteria five: Dose–response

*If interventions leading to a larger increase in prices have a greater effect on alcohol consumption and alcohol-related harm than interventions where the price change was small, or if studies demonstrate that different minimum prices have differing effects.*

Overall, there was strong support for the dose–response criterion, although the relationship was difficult to quantify. Many of the studies using the Sheffield Alcohol Policy Model explored the impact of a range of potential minimum unit pricing options and these consistently suggested that the higher the minimum unit pricing the greater the reductions in alcohol consumption or alcohol-related harms. The Canadian studies of minimum pricing lent further support.

### Criteria six: Plausibility

*Whether there is evidence that alcohol price can be used as an economic mechanism to influence consumption at a population level, and whether heavy drinkers tend to purchase cheaper alcohol.*



There was strong support for the plausibility criterion. There was evidence from 21 of 26 research studies and four of seven studies in the grey literature that the price of alcohol was inversely related to alcohol-related morbidity, hospital admissions or mortality. There was evidence from numerous observational studies in the UK, Ireland, and Australia and one trial from the US that heavier drinking was significantly associated with purchasing alcohol below specified prices, further suggesting that economic mechanisms such as minimum pricing would particularly affect the heaviest drinkers.

### Criteria seven: Coherence

*Whether studies conducted in different settings or disciplines have complementary findings; not demonstrated by a single study in isolation but rather the evidence base as a whole.*

Overall, the evidence base provided strong support for this criterion. The findings of the majority of studies suggested that real-world minimum unit pricing or minimum price increases led to reductions in alcohol consumption and alcohol-related harm. Surveys found that it was the heavier drinkers that were drinking the cheapest alcohol. The modelling studies which used survey data suggested that heavier drinkers would be most affected by minimum unit pricing.

### Criteria eight: Experiment

*In addition to laboratory studies and randomised controlled trials, natural experiments with before-and-after measures could also show the effectiveness of minimum unit pricing in a 'real-world' setting.*

There was tentative support for the experiment criterion. No randomised controlled trials could be identified of minimum unit pricing or price-based interventions to reduce alcohol consumption. There was, however, substantial evidence in support of the criterion from **natural experiments** and analyses of data collected at several points over time.

### Criteria nine: Analogy

*Identifying similar associations or causal relationships in other relevant areas, such as whether higher taxation on alcohol is associated with reduced alcohol consumption and alcohol-related harm.*

Overall, the support for this criterion was very strong, although it provided the weakest evidence of the nine criteria for causality. There was evidence that consumption and harm are very responsive to the affordability of alcohol. Large systematic reviews have found that higher alcohol pricing and taxation (considered together) are associated with reductions in alcohol consumption, alcohol-related disease and mortality.

## The authors' conclusions

This comprehensive review of a disparate evidence base investigated whether minimum unit pricing of alcohol is likely to reduce alcohol consumption and alcohol-related harm.

All nine of the Bradford Hill criteria for determining causality were met, and the vast majority of studies offered support for price-based alcohol policy interventions. However, the evidence for two of the criteria that can provide the strongest evidence for causality (strength of the association, and experiment) was not as strong as others.

The conclusion was therefore that it is highly probable, but not certain, that introducing minimum unit pricing for alcohol would reduce alcohol consumption and alcohol-related harms.

Unanswered questions about the effectiveness of minimum unit pricing remain. There may be opportunities to explore this in countries such as Scotland if/when minimum unit pricing is implemented. If Scotland were to implement minimum unit pricing, then it would be possible to: evaluate the validity of the **Sheffield Alcohol Policy Model** studies ([1](#) [2](#) [3](#) [4](#) [5](#)) using Scottish data; and to conduct a longitudinal study to evaluate the effectiveness of minimum unit pricing.

**FINDINGS COMMENTARY** Unable to draw on evidence from randomised controlled trials – considered the 'gold standard' in research – this review applied nine criteria to the evidence base to assess the degree of confidence we can have in the expectation that minimum unit pricing will have an effect on drinking and related harm. On balance, it found that it was likely that introducing a minimum price per unit of alcohol would reduce alcohol consumption and alcohol-related harms.



The review could not, however, reach a definite verdict due to the lack of conclusive evidence from rigorous trials. In 2013, **it was the** "absence" of "empirical" and "conclusive" evidence that

purportedly persuaded the Home Secretary that “it would be a mistake” to implement minimum pricing in the UK. [However](#), the previous year, when presumably the evidence had been no more conclusive and empirical, the government had pledged their commitment to a uniform minimum price per unit (about 8g) of alcohol across all drinks, substantially raising the cost of cheaper and stronger products.

An Effectiveness bank hot topic [covered](#) this U-turn, discussing how what one year may be judged a sufficiently robust platform for radical action may the next be pronounced too flimsy. Even whether the evidence needs to be conclusive – or whether uncertainty can be tolerated – is a judgement which too can change.

Approaches to alcohol policy [differ widely](#) across the UK. Scottish policy appears to be most closely aligned with evidence-based recommendations, framing alcohol as a whole population issue, in contrast with UK government policy which is influenced to a greater extent by prevailing beliefs about personal responsibility for alcohol issues.

After five years’ opposition from the Scotch Whisky Association, in November 2017 the UK supreme court [backed](#) the Scottish government’s plans to introduce a minimum price for all alcoholic drinks, its seven judges [agreeing](#) unanimously that it was “a proportionate means of achieving a legitimate aim”. The Scottish Government [subsequently](#) implemented its original plans to set a £0.50 minimum price in May 2018. As of June 2018, legislation allowing for a minimum price per unit of alcohol has been approved in Wales, with a public consultation expected by the end of the year on what the minimum price should be.

Drinks industry actors such as the Scotch Whisky Association overwhelmingly [oppose](#) whole population approaches for curbing drinking and alcohol-related harms, claiming they are ‘blunt instruments’ which fail to address the real policy problems and have unintended negative consequences. On minimum unit pricing, common objections from the drinks industry are that it is ineffective, illegal and counterproductive, and that it unfairly targets moderate and less wealthy drinkers.

The Effectiveness Bank [examines](#) the research and policy context for minimum unit pricing.

Last revised 01 August 2018. First uploaded 20 July 2018

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