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# Disentangling the messiness of natural experiments to evaluate public policy

*Comprehensive evaluations of public policy using natural experimental studies often produce mixed findings. Making sense of these to inform decision making requires a robust critique, synthesis and communication of all available evidence.*

Evaluating natural experiments can be messy. This messiness can arise from multiple sources, including lack of researcher control over the intervention, unmeasured confounding and a poor or inappropriate counterfactual. Furthermore, it is commonplace for multiple studies to be undertaken that explore a similar research question but incorporate diverse study types (e.g. qualitative and quantitative), methodological designs (e.g. cross-sectional and longitudinal), data sources (e.g. self-report surveys and retail sales), populations of interest (e.g. general population and dependent drinkers), time-periods and analytical approaches. These can produce a diverse and sometimes conflicting set of answers.

Such messiness is playing out in Scotland in relation to the evaluation of minimum unit pricing (MUP) and, specifically, its impact on alcohol consumption. In a recent Opinion and Debate article, Holmes [1] summarizes 12 studies that have explored whether the introduction of the policy in 2018 has led to the theorized reduction in consumption in Scotland overall and among population subgroups

most likely to experience alcohol-related harm, including men, harmful drinkers and those living in the most disadvantaged circumstances.

Perhaps unsurprisingly, these heterogeneous studies have produced some heterogeneous findings. This can be problematic, as contradictory findings and the identification of potential unintended negative outcomes are seized upon by those with vested interests to create a distorted picture of the evidence base [2]. It is therefore important that the public health community and, in due course, Scottish parliamentarians, can make sense of what all these findings mean, both individually and collectively, taking into consideration the studies' relative strengths and limitations. Holmes offers this, presenting a detailed and nuanced critique to arrive at the conclusion that MUP in Scotland has led to reduced alcohol consumption, including among heavier drinkers.

Holmes points to a paper co-authored by the first author, which has been released since the time of writing, that adds further data for triangulation when assessing the effectiveness of MUP. Using robust and accurate administrative data, the study demonstrated that MUP was associated with reduced deaths and hospital admissions entirely caused by alcohol in Scotland during the 32-month period after its implementation [3]. The biggest driver of these changes was chronic harms, including alcoholic liver disease. It would not be plausible to see a reduction in these outcomes at a population level without

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reduced consumption among those drinking at high levels. However, ‘messiness’ remained, with a potential increase in deaths and hospitalizations due to acute conditions also found. While these increases were more than offset by the declines in chronic outcomes, resulting in a total decrease in health harms, it is important to assess all aspects of the evidence available.

Further support comes from the experience of other countries that have implemented and evaluated MUP. In the Northern Territory in Australia, for example, MUP was found to be associated with reduced consumption and improvements among a range of short-term health and social outcomes, including reduced alcohol consumption in targeted products [4, 5], reduced alcohol-related assaults [6] and reduced police escorted emergency department attendances [7]. The concern that MUP would unfairly affect those who drink at low to moderate levels (i.e. within the low-risk guidelines) in Scotland also appears to be unfounded. Again, evidence from Australia supports this finding in a different culture and context where, on average, moderate drinkers were found to have spent an average of fewer than 9 cents more per week on alcohol due to MUP [8].

However, MUP is not a panacea. The insights from the studies reviewed by Holmes reinforce the need for multi-faceted alcohol control policies, including actions specifically designed to support those with alcohol dependency and to address alcohol consumption among children and young people. Critics are correct to highlight that some individuals in some population subgroups may have deepened harmful strategies to continue to afford alcohol since MUP was introduced, even if those individuals were already engaging in such strategies pre-MUP [9]. However, using this as evidence to repeal MUP, rather than to justify further support for individuals with dependence, risks losing the substantial public health benefits the legislation has brought about. Like many good policies, implementation has resulted in some important gains and highlighted areas in which there is more work to be done. There is growing recognition that many people with dependence issues are dealing with trauma or other issues, including increasing socio-economic inequality, that are causing or exacerbating their problems with alcohol [10]. This is a group that requires more assistance and resources with or without MUP.

While the Scottish Parliament awaits a final synthesis report from Public Health Scotland before deciding on the future of the legislation, the multiple jigsaw pieces from studies published to date combine to paint a sufficiently clear picture: MUP is an effective population-level public health policy and an important ‘best buy’ in the policy toolkit for reducing alcohol-related harm.

## KEYWORDS

Alcohol, consumption, evaluation, natural experiment, policy, pricing

## AUTHOR CONTRIBUTIONS

**Mark Robinson:** Conceptualization (lead); project administration (lead); writing—original draft (lead); writing—review and editing (equal).

**Sarah Callinan:** Writing—review and editing (equal). **Nicholas Taylor:** Writing—review and editing (equal).

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## DECLARATION OF INTERESTS

M.R. is a former employee of Public Health Scotland and was a member of the project team that is leading the MUP evaluation in Scotland. He is a co-author on several studies cited in the Holmes article.

## DATA AVAILABILITY STATEMENT

N/a.

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## A timely piece of global relevance, but shouldn't we move towards more real-world studies of the effect of multiple policy interventions and ongoing monitoring of alcohol policy impacts?

*Holmes' paper offers insight into the forthcoming Public Health Scotland report, expected later in 2023, which could influence decisions on minimum unit pricing (MUP) beyond Scotland. However, evaluating the impact of MUP should consider the simultaneous effect of other alcohol control measures, ideally informed by ongoing surveillance on alcohol use, harms and control measures.*

Holmes [1] reviews a broad range of studies using different methodologies and data sources to evaluate the impact of minimum unit pricing (MUP) on alcohol consumption and harms in Scotland. This article is timely, coming out several months before the expected release of Public Health Scotland (PHS)'s anticipated final evaluation report on MUP. As such it provides a possible indication of what we might expect in the PHS report, although Holmes [1] includes data not included in the PHS evaluation.

With the risk of MUP enabling legislation in Scotland not being renewed after its automatic expiration at the end of April 2024 if the evaluation of the goals of implementing MUP in Scotland are not deemed to have been realized, this could affect not only the future of MUP in Scotland, but could also have negative ramifications for decisions around the implementation of MUP in other parts of the world, including the Western Cape, South Africa [2]. This is because the Scottish MUP 'project' is widely seen as one of the best case-

studies for assessing the impact of MUP because it is one of a few examples where MUP has been directly linked to alcoholic content for its whole alcohol market, not just for certain drink types (such as spirits) and because of the breadth of research undertaken to evaluate it. Desired outcomes included decreasing consumption of alcohol by reducing overall consumption of alcohol, especially among people drinking at hazardous and harmful levels [3].

While much can be learnt from the emerging data on the effect of the introduction of MUP in Scotland, including the findings that reported 'that MUP reduces alcohol sales by ~3.0 to 3.5%, with larger effects on cider and spirits than other beverage types' [1], this may not provide a full picture of the impact of MUP in parts of the world such as Africa, where beer consumption is substantially higher than in the United Kingdom [4] and where there is a greater risk of drinkers moving towards unrecorded alcohol following the introduction of MUP.

There is tremendous value in research assessing the impact of single interventions such as the impact of MUP upon alcohol consumption and harm. However, these interventions occur in a context of changing socio-economic, political and other conditions, including other alcohol policy responses. It would have been useful for Holmes [1] to have situated the evaluation of MUP in Scotland in terms of these conditions. How might factors such as Brexit, the COVID19 pandemic and increasing energy prices have impacted the findings?