Public Health Scotland

Evaluating the impact of minimum unit pricing for alcohol in Scotland: Final report

A synthesis of the evidence

27 June 2023

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489

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Contents

Embargoed

Embargoed

Embargoed

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Declaration of interests

Public Health Scotland is funded by the Scottish Government. The studies included in this evaluation that were commissioned by Public Health Scotland were funded by the Scottish Government. A number of the studies used as evidence in the evidence synthesis were authored or co-authored by members of the evaluation team, either in their current roles at Public Health Scotland, or at previous roles elsewhere. Public Health Scotland is committed to providing independent and impartial evidence to inform public health policy.

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Abbreviations

ABV	Alcohol by volume
CASP	Critical Appraisal Skills Programme
CI	Confidence interval
COVID-19	Coronavirus disease 2019
DRS	Deposit Return Scheme
EAG	Evaluation Advisory Group
EPHPP	Effective Public Healthcare Panacea Project
EPoS	Electronic point of sale
EPPI	Evidence for Policy and Practice Information Centre
EW/E&W	England & Wales
FW	Fortified wine
GBP	Great British Pound (£)
GVA	Gross value added
MUP	Minimum unit pricing
PHS	Public Health Scotland
RTAs	Road traffic accidents
RTDs	Ready-to-drink beverages
SCRIBE	Single-Case Reporting Guidelines in Behavioural Interventions
SIMD	Scottish Index of Multiple Deprivation
UK	The United Kingdom of Great Britain and Northern Ireland

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Glossary

Acute condition/cause

An acute condition or cause is one that develops suddenly and occurs over a short duration. An acute alcohol-attributable condition is one likely to be associated with an episode of excessive alcohol consumption, such as alcohol intoxication.

Alcohol-attributable

A health outcome that may be attributed, at least in part, to the consumption of alcohol. A **wholly alcohol-attributable** condition is one that is caused directly by alcohol consumption and would not have occurred in the complete absence of alcohol. A **partially alcohol-attributable** condition is one where alcohol is known to contribute to the cause of the condition but is not the sole cause.

Alcohol dependence

Alcohol dependence is characterised by craving, tolerance, a preoccupation with alcohol, and continued drinking in spite of harmful consequences (for example, liver disease or depression caused by drinking).

Alcoholic drinks industry

Producers, wholesalers and retailers of alcoholic drink products.

Alcohol-related health harm

The negative impact on health associated with alcohol consumption, including health conditions that are either wholly or partially attributable to alcohol consumption.

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Alcohol-related social harm

Broader societal consequences of alcohol consumption beyond the impact on the health of individuals. This includes, but is not limited to, alcohol-related crime, impact on healthcare and other public services, changes in individuals' behaviour (including spending on commodities other than alcohol), and road traffic accidents.

Alcohol unit

An alcohol unit is equal to 10ml (or 8g) of pure alcohol. A unit is a way of expressing the alcohol content of an alcoholic drink.

Binge drinking

A heavy drinking session in which someone drinks a lot of alcohol in a short period of time, raising their risk of harm on that occasion. Typically, this is defined as those who drink at least weekly, consuming 6 or more units for women, and 8 or more units for men, on a single occasion.

Chronic condition/cause

A chronic condition or cause is one that develops slowly and may worsen over time. A chronic alcohol-attributable condition is one that develops due to long-term alcohol consumption, such as alcoholic liver disease.

Confidence interval

The range of values that is likely to contain the actual but unknown population value. A confidence interval gives an indication of the degree of certainty of an estimate and helps to determine how precise an effect estimate is. These values are defined by lower and upper limits. The wider a confidence interval is, the less precise the estimate is. The narrower a confidence interval is, the more precise the estimate is.

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Confidence intervals can also be used to give an indication of statistical significance, namely when the interval does not include zero (or one, depending on the method), i.e. the estimated effect size is less likely to be due to random variation.

Deposit Return Scheme (DRS)

A **Scottish Government proposal** aiming to increase recycling rates and manage waste by adding a refundable deposit to the price of all drinks sold in single-use containers. The current proposal is to add a deposit charge of £0.20 to every single-use drinks container.

Grey literature

Materials and research produced by organisations outside of traditional commercial or academic publishing routes. Common grey literature publication types include reports (annual, research, statistical, technical, and so on), working papers, government documents, white papers and evaluations. Organisations that produce grey literature include government departments and agencies, civil society or non-governmental organisations, academic centres and departments, and private companies and consultants.

Harmful drinking

A pattern of alcohol consumption that is causing mental and/or physical harm to health. Generally indicated by alcohol consumption at a level of 35 or more units per week for women, and 50 or more units per week for men.

Hazardous drinking

A pattern of alcohol consumption that increases an individual's risk of harm. Generally indicated by alcohol consumption at a level of more than 14 units a week,

Embargoed

but fewer than 35 units a week for women. For men, alcohol consumption at a level of more than 14 units a week, but fewer than 50 units a week.

Interrupted time series

Interrupted time series is a method of analysis involving collection of a continuous series of data before and after a specific event or intervention. This is a robust method of estimating the effects of an intervention in circumstances where randomisation is impossible or inappropriate.

Natural experiment

A type of social research method where the division of the population into exposed and unexposed groups is outside of the researchers' control. This typically exploits the timing and/or location of a change such that it occurs for some places or groups of people, creating an exposed group, but does not occur in similar places or groups of people, thus creating a control group. MUP being implemented in Scotland on 1 May 2018, but not in England & Wales, is a good example of this.

Non-beverage alcohol

Products such as methylated spirits or alcohol-based antimicrobial hand gel, which are not intended for human consumption, but which may be drunk by some people in some circumstances.

Odds ratio

An odds ratio represents the association between exposures and outcomes, with values greater than 1.0 indicating that the exposure is associated with an increase in the outcome, and values less than 1.0 reflecting a decrease. An odds ratio is considered statistically significant if the confidence interval range does not include 1.

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Off-trade

Licensed premises where alcohol is sold for consumption off the premises, such as convenience stores, supermarkets and specialist alcohol retailers.

On-trade

Licensed premises where alcohol can be sold and consumed on the premises, such as pubs, bars, clubs and restaurants.

Perry

An alcoholic beverage similar to cider but made from pears rather than apples.

Ready-to-drink beverages (RTDs)

Pre-mixed alcoholic drinks or cocktails typically sold in single-serve cans or bottles.

Statistical significance

Statistical significance can be used to quantify our confidence about whether an effect estimate reflects a true change in the population (relative to the hypothesis of no change) or whether it may be down to random variation. A p-value with a 5% threshold is often used to assess statistical significance. An observed change is statistically significant at the 5% level (p is less than or equal to 0.05) if there is less than a 1 in 20 (95%) chance of the observed change actually being due to random variation. The smaller the p-value, the lower the chance of the observed change being due to random variation.

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Key messages

Background

- Minimum unit pricing (MUP) sets a minimum price below which alcohol cannot be sold in licensed premises in Scotland. MUP was implemented on 1 May 2018 at £0.50 per unit.
- The legislation by which MUP was implemented includes a sunset clause, requiring that MUP cease after six years of operation unless the Scottish Parliament votes for it to continue.
- The legislation also includes a review clause, requiring Ministers to lay before the Scottish Parliament a report on the operation and effects of MUP after five years of being in place.
- The Scottish Government commissioned Public Health Scotland to conduct an evaluation of MUP that will help to inform the Scottish Parliament decision on whether MUP will continue.
- The evaluation sought to answer two overarching questions:
    a. To what extent has implementing MUP in Scotland contributed to reducing alcohol-related health and social harms?
    b. Are some people and businesses more affected (positively or negatively) than others?

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To what extent has implementing MUP in Scotland contributed to reducing alcohol-related health and social harms?

- There is strong evidence that MUP reduced deaths directly caused by alcohol consumption (wholly attributable) in Scotland compared to what would have happened in the absence of MUP. The overall reduction was driven by

reductions in deaths due to chronic causes, such as alcoholic liver disease. There was some indication of a small increase in deaths from acute causes, such as alcohol intoxication, but there is considerable uncertainty around this finding in part due to the relatively small number of deaths due to acute causes.

- There is strong evidence that MUP reduced wholly attributable hospital admissions due to chronic causes. There is some evidence of an increase in wholly attributable admissions due to acute causes. Overall, it is likely that MUP has reduced wholly attributable hospital admissions in Scotland compared to what would have happened in the absence of MUP.

- There is no consistent evidence that MUP impacted on other alcohol-related health outcomes such as ambulance callouts, emergency department attendances and prescribing of medication for alcohol dependence.

- There is no consistent evidence of either positive or negative impacts on social outcomes, such as alcohol-related crime or illicit drug use, at a population level.

- There is some qualitative evidence of negative health and social consequences at an individual level, particularly for those with alcohol dependence who are financially vulnerable.

Are some people and businesses more affected (positively or negatively) than others?

- The observed reductions in wholly attributable deaths and hospital admissions were greatest among men and those living in the most deprived areas of Scotland.

- There is strong and consistent evidence of a reduction in alcohol consumption following MUP implementation. Total alcohol sales reduced by 3% driven entirely by a reduction in sales through the off-trade (supermarkets and other

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shops). Those households that purchased the most alcohol prior to MUP also reduced their purchasing the most after implementation.

- MUP impacted on the price of some products more than others, particularly some ciders and spirits. This was reflected in alcohol sales, with the greatest reductions in sales observed among these products.

- Retailers found that loss in sales was generally offset by an increase in price; the impact on profits overall is not clear.

- Overall, there is no consistent evidence that MUP impacted either positively or negatively on the alcoholic drinks industry as a whole.

Considerations for policy decision-makers

Whether or not MUP should be retained, and at what level the MUP is set, is a decision for policy-makers, who will need to weigh up the potential benefits and risks. If MUP continues, in order to maintain and further enhance the positive impacts, the following should be considered:

- The evaluation of MUP was conducted with MUP set at a consistent rate of £0.50 per unit of alcohol. It is likely that any beneficial impacts of MUP realised to date will only continue if the value of MUP compared to other prices and incomes is maintained. Increasing the value of MUP could potentially increase the positive impact on alcohol consumption and related harms, but would need to be balanced against the potential for any harmful consequences to also increase.

- There is limited evidence to suggest that MUP was effective in reducing consumption for those people with alcohol dependence. Those with alcohol dependence are a particular subgroup of those who drink at harmful levels and have specific needs. People with alcohol dependence need timely and evidence-based treatment and wider support that addresses the root cause of their dependence.

- The evaluation has demonstrated that some people with alcohol dependence who have limited financial support may experience increased financial

Embargoed

pressure as a result of MUP. Consideration needs to be given on how best to monitor the needs and provide services for those in this group to minimise the negative impacts of MUP. This would be particularly important if increases to the level of MUP are introduced. Strategies to do this should be informed by the evidence.

- Those under 18 years of age generally reported that MUP had not affected their alcohol consumption, largely because price was a relatively minor factor in their decision to drink alcohol. Alternative evidence-based approaches should be considered to reach drinkers below the legal age for purchasing alcohol.

- Policy-makers should consider how new policies, such as the proposed Deposit Return Scheme, might interact with the MUP pricing structure.

Conclusion

- Overall, the evidence supports that MUP has had a positive impact on health outcomes, namely a reduction in alcohol-attributable deaths and hospital admissions, particularly in men and those living in the most deprived areas, and therefore contributes to addressing alcohol-related health inequalities. There was no clear evidence of substantial negative impacts on the alcoholic drinks industry, or of social harms at the population level.

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1. Introduction

This is the final report from the Public Health Scotland (PHS) evaluation of minimum **unit** pricing (MUP) for alcohol in Scotland. In this report we start by outlining the process by which MUP was introduced in Scotland and how we set out to evaluate the policy (Chapter 1). We then describe the literature search, quality assurance, and evidence synthesis process (**Chapter 2**). In **Chapter 3** we describe what the evidence synthesis tells us about the effects of the policy, and how different groups or organisations have been affected differently. **Chapter 4** presents our consideration of a number of factors other than MUP as possible alternative explanations for the observed trends. **Chapter 5** summarises the key results, the strengths and limitations of this synthesis and our interpretation of what all the evidence taken together means. Our future considerations for decision-makers and overarching conclusions are set out in **Chapters 6** and **7** respectively.

1.1. Background

The Alcohol (Minimum Pricing) (Scotland) Act 2012 was passed by the Scottish Government in June 2012.[1] The legislation provided the legal framework for the introduction of minimum unit pricing (MUP) of alcohol, an important component of the Scottish Government's alcohol strategy, Changing Scotland's Relationship with Alcohol: A Framework for Action.[2] This strategy was developed in recognition of the well-documented harm alcohol was causing to individuals, families, communities and society in Scotland. The strategy contained a comprehensive package of policy actions which, collectively, aimed to reduce population levels of alcohol consumption and, in turn, associated levels of **health harms and social harms**.

The minimum pricing legislation makes provision for Scottish Ministers to set a strength-based floor price below which alcohol cannot be sold in licensed premises in Scotland. The legislation requires that MUP expires at the end of the sixth year of implementation unless the Scottish Parliament votes for it to continue. This is referred to as the sunset clause. There is also a requirement for Ministers to lay before the Scottish Parliament a report on the operation and effects of MUP as soon

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as possible after the end of the fifth year of implementation. This is referred to as the review clause. The review report must detail the operation and effect of MUP on:

- the five licensing objectives*
- producers of alcoholic drinks and licence holders† in Scotland
- other appropriate category of person, determined with reference to certain characteristics such as age, gender, socioeconomic status and alcohol consumption.

The legislation was subject to a legal challenge which concluded in November 2017 when the UK Supreme Court ruled that the Scottish Government MUP legislation was a proportionate means of reducing health harms caused by alcohol in Scotland, and could be implemented in the manner proposed.[3] In its ruling, the Supreme Court accepted that MUP involves market distortion, and that some producers and retailers may be more affected than others, but considered that did not outweigh the health benefits intended by MUP. Furthermore, they recognised the experimental nature of MUP and judged the inclusion of the sunset and review clauses to be important in reaching their decision to allow MUP to go ahead. Secondary legislation setting the level of MUP at £0.50 per unit of alcohol was passed in April 2018 and MUP was implemented in Scotland on 1 May 2018. In 2017, just under half of all **off-trade** alcohol was estimated to have been sold under this £0.50 per unit floor, and the average price was £0.54 per unit. In contrast, the average price in the **on-trade** was £1.08 per unit.[4] MUP was therefore not expected to impact the on-trade.

Scottish Government commissioned NHS Health Scotland (part of Public Health Scotland (PHS) since April 2020) to lead the evaluation of MUP that will form the basis of the Scottish Government review report and inform the Scottish Parliament

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* The five licensing objectives are: Preventing crime and disorder; securing public safety; preventing public nuisance; protecting and improving public health; and protecting children and young persons from harm.

† This includes both on- and off-trade premises.

vote on whether MUP will continue beyond 30 April 2024. In 2018, an update of alcohol strategy was provided in Alcohol Framework 2018 which reaffirmed Scottish Government's commitment to the evaluation of MUP.[5]

1.2. Evaluation questions

The overarching evaluation questions for our evaluation of MUP are:

- To what extent has implementing MUP in Scotland contributed to reducing alcohol-related health and social harms?
- Are some people and businesses more affected (positively or negatively) than others?

These questions were set by the evaluation team and agreed by the Governance Board. They were chosen because they reflect the intention to reduce alcohol harms, the importance of understanding differential impact and unintended consequences and the need for the evaluation findings to assist the Scottish Government in meeting the reporting requirements of the legislation.

1.3. The evaluation approach

We took a theory-based approach to the evaluation of MUP. Theory-based evaluation is used in the evaluation of social or public health policy interventions where it is difficult or impossible to use traditional experimental methods to establish whether the outcomes observed were caused by the policy being evaluated and where there are many potential outcomes across a range of domains.[6] The approach used is described in detail in the MUP evaluation protocol.[7] For the purposes of this synthesis report, key points are summarised in the remainder of this chapter.

Taking a theory-based approach,[8] we can conclude that MUP has contributed to the desired reduction in **alcohol-attributable** deaths and hospitalisations if:

- there is a plausible 'theory of change' that shows how MUP is linked to reduced alcohol-attributable deaths and hospitalisations through a chain of

Embargoed

short- and medium-term outcomes, namely that the price of low-cost, high-strength alcohol increases and alcohol consumption decreases

- it can be demonstrated that MUP was implemented and complied with
- evidence is gathered which demonstrates that the price of high-strength, low-cost alcohol increased, consumption decreased and there was an improvement in health outcomes
- external factors also influencing these outcomes have been assessed and, where possible, accounted for.

1.4. Theory of change for MUP

Using existing evidence (summarised in the evaluation protocol[7]) and additional suggestions from discussions with stakeholders,* we developed a theory of change of how MUP might impact on health and wellbeing (**Figure 1**). The theory of change shows the main expected chain of outcomes whereby implementation of MUP increases the price of low-cost, high-strength alcohol, reducing alcohol consumption and in turn reducing alcohol-related health and social harms.

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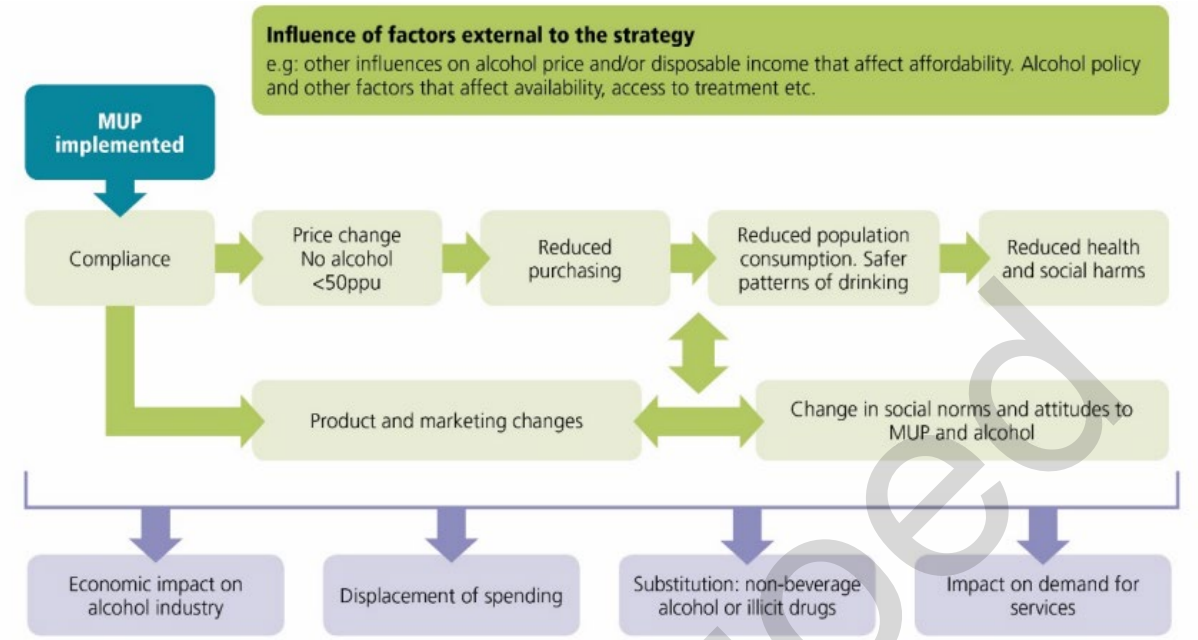
* Stakeholders include alcohol and drug partnerships, strategic and delivery partners from statutory and non-statutory services, academic and producers and retailers of alcoholic drink products.

Figure 1: Theory of change for minimum unit pricing for alcohol



In addition to this main pathway, MUP may also stimulate other changes that may or may not impact the overall outcome of MUP. For example, the **alcoholic drinks industry** may make changes to pack sizes, alcohol strength or product range, with new products introduced while others are discontinued. The price of alcoholic products not affected by MUP may change, either increasing to maintain the price differential or decreasing to compete at what is now the lower end of the price range. New marketing strategies may be introduced to replace competition based on low price and/or take advantage of any increase in revenue.

These product and marketing changes may in turn impact on alcohol consumption by changing attitudes to MUP and social norms around drinking, and vice versa (i.e. changes in social norms may result in changes in consumption and/or alcoholic drink products). MUP may also result in other changes, such as: substitution to **non-beverage alcohol** or illicit drugs; displacement of spending previously used for other goods or services; an increase or decrease in demand for services; and a variable economic impact on organisations that are part of the alcoholic drinks production, distribution and retail chain.

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The overall effects of MUP will be influenced by its interaction with factors external to MUP. These include factors that influence the price of alcohol (e.g. changes in alcohol duty or inflation in the price of raw materials or distribution costs). Also important are factors that influence the disposable income available to purchase alcohol (e.g. wages, welfare reform, inflation in the prices of other goods and services). There are also other factors that may affect people's drinking. These may include attitudes to drinking, alcohol policy that changes alcohol availability or marketing, the provision of treatment and care services, or changes in the broader social and economic determinants of health. The COVID-19 pandemic, and subsequent lockdown measures put in place in the UK in March 2020, were significant unexpected external factors (affecting alcohol availability, drinking behaviour, access to treatment). In the discussion we describe how we took account of COVID-19 and considered what other external factors may have contributed to the outcome changes we observed.

The effects of MUP may change over time. For example, any immediate impact of reduced availability of high-strength, low-cost alcohol, particularly among those already **drinking at harmful levels**, may differ from longer-term effects of any change in the amount or pattern of drinking.

1.5. The portfolio of evaluation studies

To provide the necessary evidence, PHS led the development of a portfolio of evaluation studies. The portfolio was designed to provide robust evidence on the outcomes described in the theory of change and to help the Scottish Government meet the reporting requirements of the legislation.* The portfolio therefore consists of

* The legislation requires the Scottish Government review to assess the impact of MUP on the five licensing objectives; on alcohol producers and licence holders; and on categories of person the Scottish Ministers consider appropriate (who may be determined by reference to key characteristics such as age, gender, socioeconomic deprivation or alcohol consumption).

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studies to assess compliance, price change and consumption as well as the impact of MUP on protecting and improving public health, preventing crime, disorder and public nuisance, securing public safety, protecting children and young persons from harm, and on alcohol producers and licence holders.

Twelve studies were carried out, or commissioned, by PHS with funding provided by the Scottish Government. These studies are referred to as the PHS-funded studies. We also supported other researchers to secure research grants or other funding to undertake seven studies. These are referred to as the separately funded studies. **Appendix A** provides a list of the studies in this original portfolio and the outcome areas covered.

A strong assessment of the impact of MUP on these various outcomes and how the outcomes came about required different types of evidence. The portfolio therefore consisted of a range of quantitative, qualitative and mixed-method study designs. The different study designs have different relative strengths and serve different purposes:

- To provide quantitative estimates of impact or change. Where possible, studies used a **natural experiment** method that compares the impacts of MUP in Scotland to England, England & Wales or regions of north England as a comparator area where the policy was not introduced (or introduced only latterly in the case of Wales).

- To provide qualitative understanding of mechanisms that might underpin the findings from quantitative studies, and insights into the lived experience of MUP including potential unintended negative consequences.

Where possible, studies were designed to allow assessment of whether the different groups specified by the legislation were impacted. For quantitative studies this was through analysis by age, gender, deprivation and alcohol consumption as the data allowed. Qualitative studies focused on specific groups such as those drinking at harmful levels, children and young people, and those who were homeless, to understand how individuals in these groups experienced MUP. These qualitative studies sought to explore both beneficial and harmful impacts of MUP in these groups.

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Different studies used data from different time periods before MUP implementation (as a baseline) and up to four years after MUP implementation (**Appendix D**).

1.6. Governance

The development and delivery of the PHS-funded MUP evaluation studies were overseen by the Governance Board. The Governance Board advised on the contents of the study portfolio, scientific good practice to deliver robust studies and maintain impartiality, and management of risks. Evaluation Advisory Groups (EAGs*) provided advice to individual or groups of PHS-funded studies on study design, data sources and context to assist interpretation. Membership of the Governance Board and EAGs included both research skills and understanding of strategic delivery and context. There was broad representation across the relevant EAGs including, but not limited to, stakeholders from public services (including health, social work, police, youth services and community education), nationally commissioned organisations, Scottish Government Analytical Services Division, the alcoholic drinks industry, and academia. EAGs overseeing a study delivered by PHS were chaired by an external (non-PHS) member. PHS staff and members of the research teams attended the EAG meetings to provide inputs and listen to advice but were not EAG members. EAGs provided comment on draft reports but the final interpretations and conclusion were determined by the relevant research team.

Public Health Scotland had a memorandum of agreement with the Scottish Government that set out the expectations and ways of working for the evaluation. Public Health Scotland was responsible for decision-making and delivery of reports.

The overarching purpose of this governance structure was to ensure that the scientific rigor, impartiality and integrity of the individual studies and the evaluation as a whole were maintained, and that the resulting evaluation was transparent and

* There were EAGs for compliance; economic impact and price; children and young people; harmful drinking; consumption and health harm; and evidence synthesis.

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credible to stakeholders. More details on the governance structure, membership and terms of references can be found in the **Technical Appendix**.

It was also important that the research we carried out or commissioned met the necessary research ethics, governance and commissioning requirements. Suppliers were procured by competition in line with government policy and the relevant procurement legislation. Contracts were awarded on the basis of scientific quality and value. Throughout delivery, all our in-house and commissioned research complied with the necessary national guidance and legislation (see the **Technical Appendix**).

1.7. Stakeholder engagement

The MUP legislation requires that key groups* are consulted by Scottish Government in their review of MUP. In addition to being participants in various evaluation studies, the evaluation engaged these and other key stakeholder groups through the governance processes described above.

Members of the governance groups and people with lived experience (contacted through the Scottish Recovery Consortium), were also invited to two engagement sessions on the final report. These sessions were facilitated by the Scottish Community Development Centre. At the first session, in October 2022, participants were invited to comment on what the evaluation had looked at and the process for bringing the evidence from the different studies together.[9] Those present considered the evaluation to be comprehensive and attempting to answer the important questions. The approach to synthesis was considered by some to be as 'good as it can be' while others felt unable to comment on that aspect. Clear and simple communication of messages was agreed to be important.

* These are: licence holders and alcohol producers as well as those with a function related to health, prevention of crime, education, social work, and children and young people.

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In the second session, in March 2023, we invited comment on a high-level summary of emerging findings.[10] Those present felt it was a good overview and appreciated the model presented attempted to distil a diverse set of studies. Attendees made some suggestions to improve accuracy and clarity, and we have taken these suggestions into account. We also invited comment on the alternative explanations we had identified, and participants offered thoughts which were used to inform subsequent sections in this report.

2. Methods

This section provides an overview of the methods we used to identify, quality check and synthesise the evidence on MUP in Scotland. More detail can be found in the evidence synthesis protocol.[11]

2.1. Identifying relevant literature

Our evidence synthesis draws on evidence from three key categories of research literature:

1. PHS-funded studies: MUP evaluation studies funded by Public Health Scotland (formerly NHS Health Scotland), either as studies commissioned by PHS or as studies undertaken by PHS staff with PHS funding used to purchase any data required.
2. Separately funded studies: Relevant studies known to PHS, but not funded by PHS, that are integral to the evaluation of MUP.*

* As noted in **section 1.5** above, there were seven separately funded studies. However, lengthy delays in providing updated approvals for access to the linked SHeS-SMR data have prevented completion of one study using the Scottish Health Survey.

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3. Additional academic and **grey literature** research about MUP in Scotland. These were carried out by researchers with no input from PHS.

The processes of searching for literature in category 3 and screening the search results are detailed in the **Technical Appendix**, as well as in the evidence synthesis protocol.[11] In brief, a public health librarian searched bibliographic databases to identify relevant peer-reviewed academic, pre-print academic and grey literature relevant to MUP. Searches covered 1 January 2018 to 10 January 2023 and were designed to identify any literature related to minimum unit pricing for alcohol in Scotland. The evaluation team screened search results for eligibility to ensure that we included only research relevant to the outcomes of MUP in Scotland.

2.2. Quality appraisal

We appraised the quality of each eligible article (and individual study components within larger publications that contained multiple distinct pieces of research). Quantitative research articles were appraised using the Effective Public Healthcare Panacea Project (EPHPP) Quality Assessment Tool for quantitative studies,[12] adapted by the evidence synthesis team to be better oriented towards appraising the types of natural experimental research designs that are feasible when appraising a complex public policy like MUP (see the **Technical Appendix**). Each quantitative paper (or quantitative component of a multi-component paper) was assigned a strong, moderate or weak rating based on EPHPP guidance.[12] Qualitative research papers, and qualitative components of multi-component papers, were appraised using the CASP (Critical Appraisal Skills Programme) Qualitative Studies Checklist[13] and assigned ratings based on the number of checklist items that were answered 'yes'; weak (0–4), moderate (4–7) or strong (8–10). Five papers rated as 'weak' were excluded from the evidence synthesis.

In cases where we appraised the quality of different components in a multi-component paper separately, and the different components received different appraisal scores, we have reported the highest score received. This is in acknowledgement that a key strength of mixed-methods research is in how disparate packages of work complement each other to provide more robust evidence.

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Two papers[14,15] (based on the same study) used research designs for which both the EPHPP and CASP tools were deemed inappropriate. We instead appraised these papers using the Single-Case Reporting Guidelines in Behavioural Interventions (SCRIBE)[16] framework as a substitute for a critical appraisal tool. The appraisals of these papers are detailed in the **Technical Appendix**.

In a deviation from the evidence synthesis protocol,[11] we commissioned the Evidence for Policy and Practice Information (EPPI) Centre (part of University College London) to provide an independent appraisal of the eligible papers to strengthen the integrity of the appraisal. Many of the eligible papers were produced by Public Health Scotland and/or by members of the team in previous posts and independent validation of our ratings reduced the risk of bias.

We compared the external (EPPI) ratings against the internal (PHS) ratings, identified any differences in rating, and held a meeting with the EPPI teams to discuss and reach consensus. There were nine papers (or components of multi-component papers) on which there was difference between the internal and external ratings (see **Technical Appendix**). The only difference that caused a paper to be removed from the evidence synthesis due to being downgraded from moderate to weak was a brief report by Elliott and colleagues,[17] but this did not have a material effect on the available evidence because the research first summarised in that report was later published in two full-length papers,[18,19] each of which was rated strong by both the internal and external quality appraisal teams.

Disagreements over ratings, final consensuses and the process of reaching consensus are described in the **Technical Appendix**. One paper[20] was appraised in pre-print form as the peer-reviewed journal paper[21] had not been published at the time of external quality appraisal. The evaluation team read each version of the paper and concluded that there were no substantial differences in the description of the design and conduct of the study, so the peer-reviewed paper was assigned the same rating as the pre-print version.

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2.3. Evidence synthesis methods

In our evidence synthesis protocol[11] we set out plans to draw on aspects of realist synthesis methods[22] and process tracing[23,24] to inform our approach to the evidence synthesis.

Realist synthesis encourages researchers to tailor their methods to their evidence needs. We therefore drew upon realist principles where they could add value to our synthesis of the evidence, but also drew on other theory-based evaluation methods (such as contribution analysis) to ensure this report provided a robust assessment of the questions most important to policy-makers as set out in our evaluation questions.

A key component of any theory-based evaluation is understanding factors unrelated to the policy being evaluated (i.e. external factors) that might have impacted on the observed outcomes. In process tracing, evaluators compare competing explanations for a given outcome, using a set of formal tests to eliminate explanations that are not consistent with the evidence. In a deviation from our protocol, we simplified our method by considering the plausibility of alternative explanations for any changes in key outcomes observed after MUP narratively rather than applying formal tests. We did this to make sure our assessment was transparent and jargon-free.

First, we produced a theory of change that provided a plausible causal explanation of how MUP may work, and a structure for the evidence synthesis. The evaluation team expanded the existing theory of change (see **section 1.4**) to make a more detailed initial programme theory of MUP, and a detailed set of 'if-then' statements describing distinct sets of contexts, mechanisms and outcomes that may underpin that theoretical model.[11] In consultation with the MUP evidence synthesis EAG, MUP evaluation collaborative (a group of researchers involved in the wider MUP evaluation portfolio) and stakeholders (see **section 1.7**), we refined the initial programme theory to make sure it was considered to be accurate and comprehensive. These processes were valuable in ensuring that the evaluation team had shared understandings of the different contexts and mechanisms that may or may not be found in the evidence, and in communicating the structure of our evaluation to external stakeholders. However, when structuring the extraction of data from the literature, we concluded that the existing theory of change first published in

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the evaluation protocol[7] sufficiently captured the key outcome areas required to address the evaluation questions.

Next, we extracted relevant data from the literature identified, screened and quality appraised through the process described above. We developed a data extraction form to capture features of the data and design of each study, as well as systematically capturing relevant findings structured around the different components of the theory of change: compliance; price; affordability; purchasing; consumption; health harms; alcoholic drinks industry and related economic factors; social harms and services; displacement, substitution and circumvention; and norms and attitudes. This framework allowed members of the review team to organise relevant findings in a consistent, rigorous way, reading each paper closely and recording any findings relevant to each part of the theory of change. To reduce the chance of error in data extraction, findings were initially extracted by one team member and then checked for accuracy by another team member.

Following data extraction, we then analysed the evidence corresponding to each outcome area. The structured data extraction process allowed complementary pieces of evidence to be synthesised across different sources of evidence and derived from different research methods. In turn, this allowed us to build robust conclusions about the likely causal pathway and gain useful qualitative insights about the mechanisms that might underpin those pathways.

We gathered plausible alternative explanations for the mechanisms and outcomes of MUP through consultation with experts and stakeholders in the stakeholder engagement process (see **section 1.7**). We assess the relative strength of evidence for different alternative explanations descriptively in **Chapter 4**, and, where the designs of individual studies helped to isolate outcomes following specific stimuli, we report this evidence in the Evidence synthesis section and in **Appendix C**.

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3. Evidence synthesis

3.1. Overview of the literature

Following screening publications for relevance and study quality, we included 40 research publications. An alphabetical list of studies and a summary of their data and methods is provided in **Appendix B**. In some cases, two publications reported on the same piece of research, e.g. when a study report was published on both the PHS website and in a peer-reviewed journal, either at the same time as, or the journal publication following the PHS publication. In these cases, those publications are reported alongside one another in the findings summary tables to avoid double-counting of findings. In cases where the same methods and findings are reported in two publications, we have given priority to scientific journal publications due to the lower risk of bias in peer-reviewed publications compared to grey literature or pre-print publications.

Five of the 40 publications included were categorised as multi-component papers, which reported two or more different packages of work with distinct methods and findings. In total, the selected publications reported 53 distinct components, of which 14 used qualitative methods and 39 used quantitative methods, including several natural experimental studies which used controlled, longitudinal research designs to isolate the impacts of MUP both over time and by comparing them against changes in control groups, most commonly England.

It is possible that different impacts of MUP may emerge at different times. **Appendix D** illustrates the timing of data collection for each quantitative and qualitative study, respectively.

The **Technical Appendix** presents the results of literature searches and screening, details the modified EPHPP tool that was used to appraise the quality of the quantitative research literature, and details the appraisal of the two papers reporting a study using an N-of-1 design. The final quality appraisal ratings of each piece of literature are illustrated in **Appendix C** alongside summaries of their relevant findings. **Appendix D** illustrates the timeframes within which data collection for each

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study were conducted. Descriptions of the pieces of literature that were excluded due to being assigned 'Weak' ratings are presented in **Appendix E**.

3.2. Evidencing the theory of change

We synthesised the evidence in the literature identified, for each of the outcome areas, to answer the evaluation questions:

- To what extent has implementing MUP in Scotland contributed to reducing alcohol-related health and social harms?
- Are some people and businesses more affected (positively or negatively) than others?

The primary aim of MUP is to reduce the harm to health caused by alcohol in Scotland. In their ruling, the UK supreme court accepted that the proposed experimental system of MUP was a proportionate way to pursue that aim.[3] Therefore, in the remainder of this chapter we first summarise the evidence for MUP having contributed to any changes in alcohol-related health outcomes in Scotland. We then synthesise the evidence to assess whether the expected main chain of outcomes between MUP implementation and any reduction in alcohol-related health harms occurred. Finally, we synthesise the evidence of any impacts of MUP on social outcomes, the alcoholic drinks industry, and attitudes to MUP.

For each of the seven outcome areas* we first provide a general description of the outcome area within the context of the theory of change – for example, why it is important and/or how it might change in light of the evidence described in the earlier sections. We then outline the number, type and quality of papers that provide evidence relevant to the outcome area, and summarise the key findings extracted

* Alcohol-related health outcomes, compliance, price, consumption, social harms, alcoholic drinks industry and attitudes to MUP.

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from those papers. Detailed findings for each outcome area are provided in **Appendix C**.

Quantitative data provide generalisable evidence of the impact of MUP in that study population. Where appropriate, and where the information is available, we report **statistical significance** (as a p-value) and/or **confidence intervals** in the text and in tables in **Appendix C.** Throughout this section we draw on the study authors' conclusions about whether an increase, decrease or no impact has been observed. However, using an exact cut-off based on statistical significance to determine whether a reported effect reflects a true change in the population can potentially result in important findings being overlooked. We have therefore added interpretive commentary when appropriate, such as when a p-value is close to the 0.05 threshold for statistical significance. To reduce the risk of inconsistency in describing statistical outcomes in the text of this report, we have used a consistent approach to interpreting quantitative findings, as detailed in **Table 1**.

The qualitative findings provide insights into the mechanisms by which impacts or lack of impacts of MUP might arise, and may also evidence responses to MUP that might be important at an individual level but that might not be detectable in the quantitative data.

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Table 1: Approach used to interpret quantitative findings

Nature of presentation of statistical result	Interpretation
Effect estimate: Large reduction or increase and **Statistical significance:** p≤0.05, or the confidence interval does not include zero (for a percentage) or one (for an **odds ratio**).	Evidence of a large effect estimate with a high level of certainty.
Effect estimate: Small reduction or increase and **Statistical significance:** p≤0.05, or the confidence interval does not include zero (for a percentage) or one (for an odds ratio).	Evidence of a small effect estimate with a high level of certainty.
Effect estimate: Large reduction or increase and **Statistical significance:** p>0.05, or the confidence interval includes zero (for a percentage) or one (for an odds ratio).	Evidence of a large effect. There is a higher degree of uncertainty around this effect estimate.
Effect estimate: Small reduction or increase and **Statistical significance:** p>0.05, or the confidence interval includes zero (for a percentage) or one (for an odds ratio).	Evidence of a small effect. There is a higher degree of uncertainty around this effect estimate.
Effect estimate: No or negligible change.	Evidence of no change.

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3.3. Alcohol-related health outcomes

The primary aim of MUP was to reduce the harm to health caused by alcohol in Scotland. Eight papers contributed evidence about alcohol-related health outcomes: four quantitative, two qualitative and two mixed-methods. After quality appraisal, seven of these papers were rated strong and one was rated moderate. In this section we first synthesise quantitative evidence on the extent to which alcohol-related health outcomes have changed and whether those changes can be attributed to MUP. We then synthesise the qualitative evidence about any effects that may not be apparent in the quantitative evidence because they did not happen on sufficient scale to be detected at a population level, but which may have effects on specific social groups and potential implications for future policy. Detail of all the findings on alcohol-related health impacts can be found in **Appendix C**.

Of the eight relevant papers, six (two quantitative, four mixed-methods) contributed quantitative evidence about the impact of MUP on alcohol-related health. There is strong evidence that MUP implementation was associated with relative reductions in deaths wholly attributable to alcohol consumption (-13.4%; 95% confidence interval (CI): -18.4% to -8.3%, $p<0.001$) when incorporating comparable data from England.[25] The researchers observed a smaller relative decrease in hospital admissions wholly attributable to alcohol, which was non-significant (-4.1%; 95% CI: -8.3% to +0.3%, $p=0.06$). Statistically significant reductions in deaths wholly attributable to alcohol consumption were identified within specific social groups, including males, females, people aged 35–65 years, people aged 65 years or older and the four most socioeconomically deprived deciles (see **Appendix C** for relevant statistics). The estimated reductions in deaths wholly attributable to alcohol consumption were largest among men, those aged 65 years or older, and those living in the 40% most deprived areas in Scotland, which the authors interpret as evidence that MUP has a positive effect on deprivation-based health inequalities in alcohol-attributable health harms.

Wyper and colleagues[25] found strong evidence that MUP was associated with reductions in deaths and hospital admissions due to **chronic conditions**. They suggest that MUP may be associated with relative increases in deaths due to **acute**

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conditions (6.6%; 95% CI: -13.7% to +31.8%, p=0.55), although there was considerable uncertainty around this finding, and that any increase in deaths from acute causes was likely to have been driven by males (4.4%; 95% CI: -1.5% to 10.6%), with little evidence of any change for females (0.2%; 95% CI: -3.5% to 4.2%). While these findings were not statistically significant, these increases in deaths from acute causes were observed within several subgroups and could be clinically important. The authors contextualise that these findings are less certain than the reductions in chronic deaths, and that acute outcomes make up a small portion of alcohol-specific deaths in Scotland.[25] The authors suggest that any potential increase in deaths due to acute conditions could be driven by a reduction in food intake due to displacement of spending from food to alcoholic drinks, or switching to products that have a higher ABV (e.g. spirits instead of ciders), as evidenced in other studies. Furthermore, the authors reported that MUP was associated with increases in hospital admissions due to acute conditions (9.9%; 95% CI: -1.1% to +22.0%, p=0.08), and that this was most likely to be driven by females rather than males. The authors contextualise that these findings are less certain than the reductions in hospital admissions due to chronic conditions.

The five other papers that contributed relevant quantitative evidence found no evidence of impacts in alcohol-related health outcomes, either positive or negative: there appears to have been no effect at a population level on alcohol-related ambulance callouts,[26] prescriptions for treatment of **alcohol dependence**[21] emergency department attendance[27] or the level of alcohol dependence or self-reported health status in drinkers recruited through alcohol treatment services in Scotland, relative to England.[28]

Longitudinal quantitative analysis of medical records of patients discharged from gastroenterology wards found that the number of patients presenting with alcohol-related liver disease decreased, but found no change in other indicators of alcoholic health harm, and an increase in one indicator.[29] However, the lack of a control group raises additional uncertainty over whether the changes were caused by MUP; and Maharaj and colleagues[30] found that this study had a high risk of bias associated with it.

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Of the eight relevant papers, three (two qualitative and one mixed-methods) contributed qualitative evidence about the impact of MUP on alcohol-related health. Professionals working with homeless and street drinkers presented some evidence that MUP was associated with increasing withdrawal, and/or an increase in the consumption of spirits, potentially leading to health harms.[18] Similarly, some drinkers and members of families affected by drinking expressed concern about increased intoxication from switching from cider or beer to spirits.[28] Some participants reflected that reduced affordability was driving individual treatment-seeking.[28] Drinkers under the age of 18 years did not report any change in the nature or extent of alcohol-related health harm after the implementation of MUP.[31]

Box 1: Alcohol-related health outcomes summary

There is strong quantitative evidence that MUP was associated with a reduction in deaths wholly attributable to alcohol consumption, relative to England. A smaller, and less certain, relative decrease was seen in hospital admissions wholly attributable to alcohol. The estimated reductions in deaths and admissions were largest among men and those living in the 40% most deprived areas in Scotland. Strong evidence was found that MUP was associated with reductions in deaths and hospitalisations due to chronic conditions, with less certain evidence that MUP was associated with an increase in deaths and hospitalisations due to acute causes.

There is no consistent evidence of a population-level effect, either positive or negative, on alcohol-related ambulance callouts, prescriptions for treatment of alcohol dependence, emergency department attendance or the level of alcohol dependence or self-reported health status in drinkers recruited through alcohol treatment services in Scotland, relative to England.

There is some qualitative evidence that MUP may have had some negative health consequences, particularly for those with alcohol dependence. These included increased withdrawal in homeless and street drinkers, an increase in the consumption of stronger alcohol types and concern about switching from weaker to stronger alcohol drinks. Some professionals reflected that reduced affordability was driving individuals to seek treatment.

In the following four sections we assess the degree to which MUP led to the chain of outcomes through which MUP was expected to impact on alcohol-related health outcomes. That is, if compliance with MUP was high, the average price of alcohol increased and consumption decreased, then confidence that MUP contributed to the reduction in deaths and hospitalisations is increased. On the other hand, if there was low compliance and/or price did not change, and/or consumption did not change,

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then the confidence that MUP made a large contribution to the improvements observed is reduced.

3.4. Compliance

Our theory of change hypothesises that a high level of compliance by retailers would eliminate the availability of products less than £0.50 per unit, leading to reduced alcohol consumption and related harm. However, if we found compliance to be low, the impact of MUP on price, and therefore on consumption and harm, would be limited.

Thirteen papers contained evidence relevant to compliance: four quantitative, four qualitative and five mixed-methods. After quality appraisal, 10 of these papers were rated strong and two were rated moderate, while one was not assigned a rating.* In this section we summarise the findings related to the extent of compliance. Other findings related to implementation, such as barriers and facilitators, are also reported in **Appendix C**.

Of the 13 relevant papers, six (four quantitative, two mixed-methods) contributed quantitative evidence about compliance with MUP. While quantitative data from compliance checks were not available,[32] these studies present quantitative evidence relevant to compliance. Three studies using data from the large, representative Kantar Worldpanel household shopping panel, using England and northern England as controls, demonstrate that sales of alcohol at less than £0.50 per unit were effectively eliminated immediately after the introduction of MUP.[33,34,35] Shopping panel data are self-reported, and therefore less reliable than automatically collected EPoS data, but do not rely on retrospective recall in the same way that surveys do. Furthermore, Griffith and colleagues[34] used the data longitudinally to look at changes in the same households over time, adding to the robustness of this analysis.

* One study used methods that could not be appraised using the EPHPP tool. See the **Technical Appendix** for more details.

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The findings of these analyses of Kantar Worldpanel data were supported by analyses of EPoS data, which found that 97.6% of products sold in a representative sample of 200 small retailers across Scotland had a nominal average sales price of at least £0.50 per unit after MUP implementation.[36] While the price of alcohol purchased is not strictly the same as the price of alcohol available, it provides a proxy for compliance, and these analyses can be taken as strong evidence that retailer compliance with MUP was high, with no time lag.

In addition to sales data, quantitative data from structured interviews with people with alcohol dependence accessing treatment services found strong evidence that the proportion of participants in Scotland, reporting that their first drink purchased and consumed in the last typical drinking week before treatment* cost less than £0.50 per unit, decreased from 59.2% pre-MUP to 13.9% 18–22 months post-implementation (p=0.008†; CIs not reported). While 13.9% is a considerable proportion, the researchers conclude that the majority of reports of purchasing alcohol for cheaper than the minimum price were due to reporting errors, as the reported price was typically very close to the MUP (e.g. £0.49 per unit).[28]

Of the 13 relevant papers, nine (four qualitative, five mixed-methods) contributed qualitative evidence about compliance with MUP. Professionals involved in performing enforcement checks reported that compliance was high,[27,33] with any individual instances of non-compliance found to be minor and quickly resolved, in both small and large premises.[32] These findings are supported by interviews with retailers, who typically reported taking compliance seriously, and found compliance to be straightforward[37,38] without incurring substantial costs.[37] When interviewed in 2021, participants from the alcoholic drinks industry typically reported that compliance had become standard practice.[39] The qualitative evidence included some reports (from retailers, drinkers and professionals working with drinkers) of

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* As part of the interview, participants were asked to complete a retrospective diary recalling the alcohol they had purchased and consumed in the last typical drinking week before treatment, using a method called Time Line Follow Back (TLFB).

† Adjusted significance threshold after sample weighting of p=0.0004630.

some drinkers still being able to obtain alcohol below £0.50 per unit[15,18,28,31,38] but these reports of non-compliance were atypical.

Box 2: Compliance summary

There is strong quantitative evidence that sales of alcohol below £0.50 per unit largely disappeared following the implementation of MUP. There is qualitative evidence that retailer compliance with the legislation was high and had become standard practice. There is qualitative evidence of some individual instances where alcohol was reported to be available at below £0.50 per unit, but these were not typical of the evidence on compliance overall.

3.5. Price

With high compliance with MUP, we would expect the average price of off-trade alcohol in Scotland to increase because products previously priced under £0.50 per unit would increase to £0.50 per unit or more. Additionally, some products already priced above £0.50 per unit could increase in price to maintain their price differential to those products that were previously below £0.50 per unit . Alternatively, some products that were previously priced above £0.50 per unit could decrease to the price floor to compete with products now priced at £0.50 per unit. The extent of any anticipated average price increase would depend on the balance of these changes. If the average price increases (because there was alcohol previously sold below £0.50 per unit that has increased in price and this has not been offset by decreases in price of higher-priced products) then it is expected that consumption and harm will reduce. If there is high compliance but price does not change (for example, because most products were already priced at £0.50 per unit and/or some products decreased in price) then the impact on alcohol consumption and harm may be limited. We would not expect to see similar price changes where MUP was not in place, such as England. As described earlier, in 2017 the average price in the on-trade in Scotland was £1.08 per unit. MUP was not expected to affect prices in the on-trade. All studies described below are referring to off-trade price.

Fifteen papers contained evidence relevant to price, of which nine were quantitative, three qualitative and three mixed-methods. After quality appraisal, 10 of these papers were rated strong and five were rated moderate. All findings related to price are detailed in **Appendix C**, with synthesis provided below.

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Of the 15 relevant papers, 10 (nine quantitative, one mixed-methods) contributed quantitative evidence about the impact MUP on price. The population-level quantitative studies used different data (alcohol sales or shopper panel purchasing data), different time periods and different analytical techniques with the findings also expressed in different formats including percentage change, price per unit and price per gram. Despite this diversity, however, all these studies consistently found that the average off-trade price of alcohol in Scotland increased compared to England/England & Wales after the implementation of MUP.[33,34,35,36,40,41]

On the whole, strong evidence suggests that changes in prices due to MUP were immediate and largely sustained.[33,35]

The extent of the price changes observed by each study varied but were broadly comparable. The average off-trade price of alcoholic drinks in Scotland was observed as having undergone a net increase of between £0.035 and £0.06 per unit (also reported as between 5% and 8.3%) due to MUP, using England & Wales, England, or specific regions of England as comparators.[33,34,35,40,42] Increases in household expenditure on alcohol following MUP were predominantly within the households that purchased the most alcohol, with no particular pattern associated with household income.[34]

The changes in price driven by MUP were different for different categories of alcoholic drinks and different price points. As expected, price changes were greatest for the products that were high-strength, low-cost pre-MUP, with some such products doubling in price per unit in Scotland, while there was little change in the price per unit of products that were already priced above the price floor.[35,40] Cider and (where measured) **perry** consistently exhibited the greatest relative increase in price per unit.[34,40,41,42] For example, Ferguson and colleagues[40] found that the price of perry per unit increased 50% in the year following MUP, with cider increasing by 25.6%. The price per unit of beer, wine and spirits increased moderately, and by approximately the same relative amount.[34,40] For example, Ferguson and colleagues[40] found that the price of beer per unit increased by 7.3% in the year following MUP, compared to 6.1% for wine and 7.0% for spirits. However, Ferguson and colleagues[40] further showed that supermarket own-brand spirits increased in price by a greater relative amount compared to the spirits category as a whole (the

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price per unit of own-brand vodka increased by 18.5%, gin by 16.1% and whisky by 12.8%) and that these products were all priced below £0.50 per unit prior to MUP implementation. At a category level, fortified wine and **ready-to-drink beverages** (RTDs) experienced smaller price increases after MUP was implemented compared to other categories.[40]

Ferguson and colleagues[40] found that, in the off-trade overall, all categories of alcoholic drinks (e.g. beer, cider, fortified wine) increased in price after MUP was implemented. In the same study, very few of the top 50 products in supermarkets or the top 50 products in convenience stores decreased in price, with the biggest decrease seen in Buckfast tonic wine in convenience stores (-3.1% in Scotland in the first year of MUP, and -1.8% in England & Wales), which also drove an overall reduction in price of fortified wine in convenience stores.

Two papers looked in more detail at the price change for low- and no-alcohol beer and cider compared to their usual strength variants.[43,44] One study, focused on prices of beer, found strong evidence that the purchase price (i.e. price per item rather than price per unit) of beer at 3.5% ABV or lower decreased in Scotland by 2.7% (95% CI: -1.7% to -3.7%; p-value not reported), relative to England and that the purchase price of beer exceeding 3.5% ABV increased by 8.8% (95% CI: +8.7% to +8.8%).[43] Another study, using the same data, found that the only category of beer or cider that decreased in price per unit was alcohol-free cider.[44]

Ferguson and colleagues analysed the price distribution of alcohol sold at a drink category level, and illustrated that prices clustered at or above the £0.50 per unit minimum price.[41] Following implementation of MUP, two-thirds of off-trade sales in Scotland were between £0.50 and £0.649 per unit, while only one-third of sales were in that price range in England & Wales.[41] The proportion of alcohol sold at £0.65 per unit and above in Scotland post-MUP was similar to that in England & Wales, and did not change substantially in Scotland with the introduction of MUP.[41] The largest changes in price distribution were observed in categories of alcoholic drinks that had typically sold at less than £0.50 per unit pre-MUP (cider, perry, and to a lesser extent beer and spirits), with smaller changes observed in categories of alcoholic drink products that sold mainly above £0.50 per unit pre-MUP (wine, RTDs).[41]

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Of the 15 relevant papers, five (three qualitative, two mixed-methods) contributed qualitative evidence about the impact of MUP on price. Qualitative evidence from retailers supports the quantitative findings. Scottish retailers reported increased prices for some product lines, in particular high-strength, low-cost ciders and own-label products[37,38] although some small retailers reflected that many of their prices had not had to change.[38]

From the qualitative evidence it appeared that drinkers' likelihood of noticing changes in price depended on the types of products they consumed before MUP. Those that did observe price increases often described those changes as small and did not always attribute them to MUP.[27] Similarly, interviews with people with probable alcohol dependence found that many reported that MUP had not affected the prices of the products that they prefer, and that awareness of price depended on the extent to which their preferred category of drink was affected by MUP.[28] Conversely, under-18s typically reported having observed some changes in prices, despite reporting that many of the most popular products among their age group were not affected by the minimum price.[31]

Box 3: Price summary

There is strong and consistent quantitative evidence, from a range of sources, of an immediate increase in the average price per unit of alcohol sold through the off-trade in Scotland, relative to other areas in Great Britain, following the implementation of MUP. Changes in price driven by MUP differed by drink type, with those products sold below the MUP prior to implementation, such as cider, perry and own-brand spirits, seeing the greatest price increases. Following MUP implementation, prices tended to be clustered at between £0.50 to £0.649 per unit; approximately double the volume of alcohol was sold in this price range in Scotland compared to England & Wales in the year following implementation. There was little evidence of impact on the price of products at or above £0.65 per unit.

3.6. Consumption

Given high compliance and the increase in the average price per unit of alcohol in Scotland (relative to England/England & Wales) following the implementation of MUP the theory of change hypothesises that consumption will be reduced relative to control areas where the policy has not been implemented. Most quantitative studies

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assessing the impact of MUP on alcohol consumption use England, England & Wales, north England or Wales as control areas.

The consumption evidence includes studies using self-report measures of consumption in addition to studies that use alcohol sales and purchasing data, as proxy measures of consumption. Alcohol sales data are the gold standard for measuring population-level alcohol consumption, when alcohol duty data are not available for individual countries within the UK.[45] In this section qualitative studies provide insights into drinking-related behaviour in different groups.

Twenty-one papers contained evidence relevant to consumption, of which 13 were quantitative, four qualitative and four mixed-methods. After quality appraisal, 13 of these papers were rated strong and six were rated moderate, while two could not be assigned a score.*

Of the 21 relevant papers, 13 contributed quantitative evidence about the impact of MUP on consumption. There is strong quantitative evidence from two studies (by the same research team) that MUP was associated with a reduction in alcohol sales after one year[46] and three years[47] of implementation. Both studies use **interrupted time series** analysis to estimate change in alcohol sales following the implementation of MUP, in Scotland and England & Wales separately, and in Scotland with alcohol sales in England & Wales incorporated as a control, to determine the change attributable to MUP (i.e. net change). Further adjustment for changes in disposable income and substitution between drink types was incorporated. Outcomes were reported for total alcohol, by market (on- and off-trade) and by drink type.

After one year of implementation, there was strong evidence that MUP was associated with a 2.0% reduction (95% CI: -3.6% to -0.4%, p=0.014) in the total volume of pure alcohol sold per adult through the off-trade in Scotland. There was strong evidence that England & Wales saw a 2.4% (95% CI: +0.8% to +4.0%,

* Two papers used methods that could not be appraised using either the EPHPP or CASP tools. See the **Technical Appendix** for more details.

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p=0.004) increase over the same period. When controlling for England & Wales and adjusting for changes in disposable income and substitution between drink types, there was strong evidence that MUP was associated with a net reduction of 3.5% (-4.9% to -2.2%, p<0.001) in total off-trade alcohol sales in Scotland (**Table 2**).[46] Results from the analysis at three years post-implementation (**Table 2**) were very similar.[47] In both studies, reductions were estimated for off-trade sales of spirits, cider and perry while increases in off-trade sales of wine and fortified wine were estimated (**Table 2**). A significant increase in off-trade ready-to-drink (RTD) sales was estimated after one year. A smaller increase in RTDs was reported after three years and this estimate had a greater degree of uncertainty than the findings after one year. Reductions in off-trade sales of beer were estimated in both years, although these results were more uncertain compared to total off-trade sales (**Table 2**). The authors noted that the proportion of each drink category sold through the off-trade was not equal, with beer, wine and spirits making up just under 90% of all sales. Thus, smaller relative changes in these categories will have a greater absolute impact on total alcohol sales than equivalent relative changes in drink categories where absolute volume sales are lower, such as cider and perry. There was very little evidence of any change to per-adult sales of alcohol through the on-trade.

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Table 2: Estimated change % (CI) in alcohol sales in Scotland, with England & Wales as control[46,47]

	Total (on- and off-trade combined) after one year % change (CI)	Off-trade after one year % change (CI)	Total (on- and off-trade combined) after three years % change (CI)	Off-trade after three years % change (CI)
All alcohol	-2.5 (-3.5 to -1.4)	-3.5 (-4.9 to -2.2)	-3.0 (-4.2 to -1.8)	-3.6 (-4.8 to -2.5)
Beer	-2.7 (-3.4 to -2.0)	-1.3 (-2.9 to 0.3)	-2.3 (-3.9 to -0.7)	-1.6 (-3.7 to 0.5)
Spirits	-3.4 (-4.6 to -2.2)	-6.4 (-7.9 to -4.9)	-4.9 (-6.6 to -3.1)	-5.5 (-7.5 to -3.4)
Wine	-1.2 (-2.4 to 0.1)	1.2 (0.4 to 2.0)	0.6 (-0.6 to 1.7)	1.8 (0.8 to 2.8)
Cider	-7.8 (-10.0 to -5.4)	-21.8 (-24.4 to -19.1)	-13.5 (-16.9 to -10.0)	-21.5 (-24.6 to 18.3)
FW	-0.9 (-3.2 to 1.8)	9.2 (2.4 to 16.7)	13.5 (7.5 to 19.8)	13.8 (8.6 to 19.3)
RTD	-6.6 (-8.7 to -4.6)	15.5 (10.1 to 21.1)	-0.5 (-6.9 to 6.3)	3.6 (-3.4 to 11.1)
Perry	-11.2 (-15.0 to -7.3)	-41.9 (-44.5 to -39.3)	-31.6 (-38.4 to -24.1)	-31.3 (-37.7 to -24.2)

Note: FW = fortified wine; RTD = ready-to-drink beverages

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Three studies, from two separate teams, used alcohol purchasing data from Kantar Worldpanel to estimate the impact of MUP on household alcohol purchases.[33,34,35] While the magnitude of the changes vary depending on the time period and analytical technique used, all found a reduction in alcohol purchases in Scotland when using England/northern England as a control. The greatest reductions were observed in the households that purchased the most alcohol, with very little or no impact on those purchasing at lower levels.[34,35] For example, Griffith and colleagues[34] found no change in alcohol purchasing in the lowest 70% of households, whereas the top 5% of households reduced purchasing by 14.8% (CIs not reported). These studies largely concur with the findings from analysis of alcohol sales data in that the greatest reductions are consistently reported for cider and spirits, products where a greater reduction in price has been demonstrated, with smaller reductions estimated for wine and beer.[34,35,47] Heavy drinkers reduced their purchases of cheap products considerably, with only limited switching towards more expensive products, leading Griffith and colleagues[34] to conclude that MUP is well targeted at heavier drinkers. There was some evidence of a shift to lower-strength beer and alcohol-free cider[43,44] although the market share of these products remains small.

A number of studies analysed self-report survey data from different sources. Self-report surveys may be subject to biases as a result of sampling, incorrect recall or social desirability, and reaching the heaviest drinkers to take part in surveys may be particularly challenging. All the surveys described below are cross sectional, which means that different people are surveyed at each wave. Sampling errors that result in systematic differences between samples are a particular issue for cross-sectional surveys. However, survey data does allow disaggregate analysis by characteristics at an individual level. Analysis of national population survey data on self-reported consumption found decreases in a number of measurements on consumption* in Scotland relative to Wales for those drinking at harmful levels, with

* These were: prevalence of drinking in the last seven days; number of drinking days; number of units consumed and the prevalence of exceeding the daily limit on the heaviest drinking day.

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little evidence of impact on those drinking at **hazardous levels**.[48] Analysis of Kantar Alcovision data found a drop in total consumption in Scotland relative to the north of England.[49] Reductions were greater for heavier drinkers and women, while MUP was associated with an increase in consumption in the 5% of men who drink the most. Reductions in consumption were greater in the older age groups, particularly for men, and for those living in less deprived areas.[49] Also using Kantar Alcovision data, a separate study found the prevalence of drinking at harmful and moderate levels did not change, but there was a reduction in the prevalence of drinking at hazardous levels.[28] A different survey with attendees at sexual health clinics (a sample heavily weighted to the younger end of the age spectrum with 65–70% below 30 years in both Scotland and England), found the odds of **binge drinking** among current drinkers recruited did not change in Scotland relative to the change seen in England post MUP.[27] However, there was an increase in the risk of alcohol misuse* among drinkers in Scotland compared with England, driven by both increase in Scotland and a decrease in England.[27] Surveying those with probable alcohol dependence recruited through alcohol services found limited evidence of any changes in consumption compared to similar drinkers in England.[28]

There was some evidence of cross-border trade, but only on a small scale, with cross-border purchase most likely by the small proportion of the population living near the border.[34,50,51] As such, cross-border purchasing is unlikely to have had a substantial impact on population-level consumption, but it may be the case that the price floor had less of an impact on consumption for those living nearest to (e.g. within 52km of) the border. Griffith and colleagues[34] interpret the lack of a statistically significant impact on the number of units of alcohol purchased by the 5% of households closest to the English border as evidence that the people in these households likely engaged in cross-border purchasing but that for Scotland as a whole such purchasing was not widespread.[34] Analysis of market research survey

* Alcohol misuse was defined as a score exceeding 2 on the Fast Alcohol use Screening Test (FAST). (Hodgson R, Alwyn T, John B et al. The FAST Alcohol Screening Test. Alcohol. 2002 Feb;37(1):61–66. DOI: **https://doi.org/10.1093/alcalc/37.1.61)**

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data found that those in Scotland living within a 60-minute drive of the border of England were most likely to purchase alcohol from England, but that there were low levels of cross-border shopping by those living in Scotland as a whole.[50,51] At £0.50 per unit and with fuel costs taken into account,* cross-border purchasing (whether in person or online) would not be practical or economically advantageous for the majority of the population for most categories of alcoholic drinks.[51]

Of the 21 relevant papers, five (four qualitative, one mixed-methods) contributed qualitative evidence about the impact of MUP on alcohol consumption, predominantly in relation to drinking behaviour in specific social groups. In general, participants described varied impacts on quantity and/or types of alcohol consumed: some reduced consumption, some were unaffected and some switched drinks. Overall, there was no clear evidence of change in the amount, pattern or type of drinking self-reported by drinkers under 18 in response to MUP,[31] adults who engage in binge or harmful drinking,[27] people with probable alcohol dependence recruited through alcohol services or the community[15,28] and people with current or recent experience of homelessness.[19] While some drinkers reported reduced consumption, some described being unaffected because they already drank alcohol above the MUP threshold,[19,28] some did not view price as a major contributor to purchasing and consumption decisions,[31] and others reported that they managed the price increase by cutting back spending on other products, switching drink category or borrowing money.[28] Professionals who provide services to people experiencing homelessness typically reported not having observed any changes in service users' consumption of alcohol. Those working with families affected by alcohol reported that they thought MUP helped reduce consumption in those drinking at hazardous or harmful levels

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* The analysis was initially conducted in May 2020 during the COVID-19 lockdown. At that time the average price of a litre of unleaded petrol was 106.7p. Fuel prices had risen to 128.4p by May 2021 and 166.9p by May 2022, which would further reduce the potential for net gain by purchasing across the border with England. Sources: **UK and overseas petrol and diesel prices**

but not those with alcohol dependence[52] (see **Social outcomes section**). Some interview participants who drink at harmful levels saw cross-border purchasing as an established means to mitigate the impact of MUP, which some participants living near the border reported having participated in or having observed others doing, although they acknowledged that the benefit of cross-border shopping was contingent on sufficient income and ability to travel.[28]

Box 4: Consumption summary

There is strong and consistent quantitative evidence of a reduction in alcohol consumption, as measured by alcohol sales or purchasing data, in Scotland relative to other areas in Great Britain. The overall reduction in consumption was driven by a reduction in consumption of alcohol sold through the off-trade. The evidence consistently shows that the greatest reductions were seen for cider and spirits with mixed evidence of the impact on beer and wine.

There is consistent quantitative evidence that the greatest reductions in alcohol purchases were seen among those households purchasing the most alcohol prior to MUP implementation, with negligible impact on those that typically purchase less.

Some evidence of cross-border purchasing was identified, but its extent was observed to be minimal, most likely to occur among those living near the Scotland–England border and unlikely to undermine the overall impact of MUP on consumption.

Qualitative evidence identified a range of effects of MUP on consumption behaviour including changes in the quantity and type of alcohol consumed. Those working with families affected by alcohol reported that they thought MUP helped reduce consumption in those drinking at hazardous or harmful levels but not those with alcohol dependence.

3.7. Social outcomes

While the primary aim of MUP is to reduce the harm to health caused by alcohol in Scotland, the theory of change acknowledges the potential for MUP to impact on wider social outcomes. These impacts may be beneficial or detrimental. Examples of potential negative impacts on social outcomes include drinkers switching to illicit or more harmful substances; drinkers reducing spending on essentials or getting into debt to accommodate increased alcoholic drink prices; or increases in acquisitive crime. Examples of positive impacts might be reductions in alcohol-related crime, reduced harm to children and young people from others drinking or a reduction in road traffic accidents (RTAs).

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3.7.1. Illicit drugs

Ten papers contained evidence relevant to illicit drugs, of which one was quantitative, five qualitative and four mixed-methods. After quality appraisal, eight of these papers were rated strong, one was rated moderate and one was not rated.* It should be noted that the data came from studies on the impacts of MUP more generally rather than the impact on illicit drugs specifically. Given that, none tried to control for the availability and affordability of illicit drugs and changes in that market independent of MUP.

Four papers (one quantitative, three mixed-methods) contributed quantitative evidence. A study of self-report data from those drinking at harmful levels[28] found that the proportion taking illicit drugs declined after MUP, although the effect was neither large nor statistically significant. A study using self-report data from attendees to sexual health clinics[27] found little evidence of change in the proportion that had taken any illicit drugs in the last month, following the introduction of MUP (odds ratio 1.04 (95% CI 0.88 to 1.24; p=0.612)). One study used a daily survey method to collect numerous repeated measures from a small group of dependent or recovering drinkers and found that of the five participants who took drugs before MUP, one reported increased use after MUP was implemented. Among the participants who reported not having taken drugs before MUP, none reported starting after implementation.[15] A study using crime data as recorded by police officers found that drug-related crime in Scotland was 'stable' before and after MUP was implemented.[53]

Of the 10 relevant papers, seven (five qualitative, two mixed-methods) contributed qualitative evidence about the impact of MUP on illicit drug use. Three of these papers included evidence on participants' own illicit drug use. Holmes and colleagues,[28] interviewing those drinking at harmful levels in the community, concluded that there was a minority of reports of increased illicit drug use after MUP,

* One study used methods that could not be appraised using the EPHPP tool. See the **Technical Appendix**.

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but these findings were 'generally less robust, less clearly connected to MUP'.[28] In a study of those with current or recent experience of homelessness, two out of 46 interviewees reported reducing their alcohol use, primarily 'cheap' cider, and increasing their use of cheap benzodiazepines, although other participants indicated that cost is not necessarily the most important driver of consumption choices.[19] In a study of children and young people's own drinking,[31] one participant reported using more cannabis as a result of the price increase in MUP, but it was noted that the price of only some of their preferred drinks were affected by the implementation of MUP. In the same study another participant reported smoking more cannabis since 2018 but specified that this was for reasons unrelated to MUP.

Five of the papers providing qualitative evidence included data from various stakeholders reporting their perceptions of others' illicit drug use. Some professionals working with people experiencing homelessness thought some service users were increasing their existing use of illicit drugs to supplement, but not necessarily replace, alcoholic drinks – however, they had mixed views on whether MUP was playing a role and argued that the availability of cheap street drugs such as benzodiazepines was influential. Some professionals working with families affected by alcohol use reported that they had observed an increase in illicit drug use after MUP but explicitly said they did not think MUP was the cause, with some arguing that MUP would affect the type of alcohol that people would drink, rather than cause a switch to different substances.[52] Two studies found that stakeholders (sexual health clinic professionals[27] and convenience store operators[38]) reported anticipating increases in use of illicit drugs prior to MUP being implemented, but reported not having observed increases after implementation. Similarly, a study of practitioners working with people who drink harmfully in the community[28] found increased illicit drug use was anticipated prior to implementation, but that few related instances were thought to have been observed post-implementation.

3.7.2. Individual and household budgets

Four papers contained evidence relevant to the effects of MUP on individual and household budgets, of which two were quantitative, two were qualitative and all received strong quality assessment ratings.

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Some studies provide evidence and insights into the potential impacts of MUP on individual or household expenditure on essentials like fuel, food and housing. One paper found there was little or no increase in expenditure on alcohol in households that generally bought small amounts of alcohol.[33,35] Changes in expenditure on alcohol were not systematically associated with household income, but were greater for those households that purchased the largest quantity of alcohol.[33,35]

Service providers working with homeless and street drinkers reported observing no increase in begging,[18] and this was largely corroborated by direct accounts of people with experience of homelessness.[19]

3.7.3. Food purchasing and nutritional quality

Six papers contained evidence relevant to the effect of MUP on food purchasing and nutritional quality, of which two were quantitative, one qualitative and three mixed-methods. All of these papers were assigned strong quality appraisal scores, with the exception of one which was not assigned a rating.*

The two quantitative papers[54,55] reported on findings from the same research project, in which Kantar Worldpanel data were analysed to investigate the effects of MUP on household expenditure on food and subsequent nutritional quality of the diet. The first paper analysed the impact on household expenditure on food, and volumes purchased. The impacts varied by category, for example a (non-significant) decrease in volume of fruit and vegetables and an increase in crisps and snacks ($p<0.01$) in Scotland post-MUP, controlling for the north of England. The authors conclude the changes to be undesirable to dietary health.[54] However, in a subsequent paper by the same research team, Leckcivilize and colleagues[55] analysed the impacts of MUP on actual diet quality and found no impact on overall diet quality or nutrients except for sugar. MUP was associated with a significant (1.6%, CIs not reported) reduction in total sugar, driven by a 16.6% reduction in sugar from alcohol (CIs not reported).

* One study used methods that could not be appraised using the EPHPP tool. See the **Technical Appendix**.

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Households from the 60% most deprived areas reduced their purchase of sugar from alcohol more than the least deprived 40%. They concluded that MUP had little significant effect on nutrition from food purchased to eat at home, except for a beneficial effect on sugar consumption.[55]

Of the six relevant papers, four (one qualitative, three mixed-methods) provided qualitative evidence, including conflicting insights into how increasing alcohol prices impacted food spend. Studies interviewing young binge drinkers, older heavy drinkers and professional stakeholders provided little evidence that drinkers limit their spending on food to maintain alcohol consumption.[18,27] On the other hand, Holmes and colleagues[28] heard interviewees with probable alcohol dependence describe MUP as creating increased financial strain, leading them to employ a number of existing strategies such as reducing spending on non-alcohol essentials including food and paying bills, seeking help from charities or borrowing money.[28] The finding that some drinkers would borrow money, potentially exacerbating existing financial hardship, was echoed in McCann and colleagues' N-of-1 study of self-identified 'heavy drinkers'.[15]

3.7.4. Crime and disorder

One potential impact of MUP on social outcomes might be an increase in crime, such as stealing to maintain alcohol consumption, or reduced crime and disorder related to public drinking and public nuisance. Six papers contained evidence relevant to crime and disorder, of which one was quantitative, two qualitative and three mixed-methods. After quality appraisal, five of these papers were rated strong and one was rated moderate.

Comparative analysis of police crime and incident data from Scotland and Greater Manchester found no consistent evidence of MUP having a beneficial or detrimental impact on crime in general.[53] Analysis of police crime and incident data did not provide any evidence of an increase in drug-related crime following the implementation of MUP.[53]

Qualitative papers provided evidence that service providers working with homeless and street drinkers,[18] police, licensing authorities and health service providers,[27] and

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people who drink harmfully[28] anticipated that MUP would lead to increased stealing and other crime, and this was a major part of professional stakeholders' reservations about MUP. However, following implementation of MUP, those working with homeless and street drinkers only reported observing increases in existing tendencies towards robbing and stealing in a minority of drinkers.[18] Very few interviewees who drink harmfully reported stealing, and those that did typically did not link it to MUP.[28] A small number of small retailers mentioned observing an increase in shoplifting, which they perceived to be due to MUP.[38]

3.7.5. Road traffic accidents

Three papers contributed evidence relevant to the impact of MUP on road traffic accidents (RTAs). Each of these papers was assigned a strong quality appraisal rating, and all comprised quantitative analysis of routine data from Scotland with data from England & Wales using comparable analysis methods. These studies provide conflicting evidence about the effects of MUP on harmful road accidents.

Francesconi and James[56] found no evidence of MUP having an effect on RTAs.[56] A pre-print paper by Manca and colleagues reports that total RTAs in Scotland increased significantly post MUP (7.2% increase, 95% CI: 0.9% to 13.7%, p=0.03).[57] Finally, Vandoros and Kawachi[58] found strong evidence of a small average decrease of between 1.52 and 1.90 daily collisions resulting in death or injury in Scotland, relative to England & Wales (difference-in-difference interaction coefficient −0.4; 95% CI: −0.7 to -0.0, p=0.03)*. The authors conclude that MUP reduced harmful RTAs.[58] As a whole, the evidence for MUP affecting RTAs, and for the direction of that effect, is not conclusive. Manca and colleagues suggest these results may be impacted by external factors, such as weather and road condition, which change over time and which were variously accounted for.[57]

* The upper confidence interval for this estimate was negative but rounded to zero in our reporting.

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3.7.6. Children and families

Three papers, each of which was assigned a strong quality appraisal rating, contributed qualitative evidence about the effects of MUP on families and children. Practitioners working with families affected by alcohol expressed concerns about the ability of those with probable alcohol dependence to absorb the price increase without affecting the family budget, but recognised MUP was just one of many factors at play in the complex lives of these families.[52] Overall, they felt unable to determine if MUP had positive or negative impact on the lives of children and young people affected by other people's drinking.[52] Holmes and colleagues[28] also provided insights into the impact of MUP on children and families. In structured interviews with those with probable alcohol dependence there was no evidence of change in any parenting outcomes after the introduction of MUP. Qualitative interviews with the families of people who drink at harmful levels provided some accounts of concerns about impacts on household budgets and the potential for increased domestic violence.[28] Analysis of survey data suggested that sharing a home with a partner or children had no impact on the consumption of people who drink at harmful levels.[28] Interviews with drinkers under 18 years old did not indicate any increase in social harms for this group linked to MUP.[31]

3.7.7. Non-beverage and illicit alcohol

Five papers[18,19,27,28,32] (three qualitative, two mixed-methods, all assigned strong quality appraisal ratings) contained evidence relevant to the relationship between MUP and consumption of non-beverage and illicit alcohol. Most data from stakeholders highlighted concerns that some drinkers would switch to illicit or non-beverage alcohol as a result of MUP, but reported limited evidence of this occurring post-implementation.[18,27,28,32] Dimova and colleagues[18] found that some stakeholders working in homelessness services reported instances of non-beverage alcohol use post-MUP implementation that might have been more likely among people who were homeless with no access to welfare benefits. Qualitative studies with people who drink harmfully[28] and people with current or recent experience of homelessness[19] found no evidence for increased use of non-beverage or illicit alcohol use after MUP.

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Box 5: Social outcomes summary

Overall, there is a lack of evidence of MUP having an impact on social outcomes at a population level. For people who already used illicit drugs before MUP was implemented, quantitative analyses from four studies found no effect of MUP on illicit drug behaviours and, while there were qualitative reports of increased illicit drug use, these were often difficult to attribute to MUP. There was no evidence that participants who did not use illicit drugs prior to MUP began using illicit drugs after implementation, meaning there was no suggestion that people started to use illicit drugs because alcohol increased in price.

There was little indication of increased use of non-beverage or illicit alcohol. Quantitative studies on crime, including drug crime, switching to non-beverage alcohol and spend on food and the nutritional value of food all found no positive or negative impact, and quantitative evidence on the impact of road traffic accidents was mixed.

There were some qualitative insights that suggest that for some drinkers, especially those with probable alcohol dependence and particularly the financially vulnerable, existing social harms, particularly those related to financial pressures, may have been exacerbated, but there is no evidence of those experiences being prevalent or typical. It is not possible to say whether children and young people in families affected by alcohol use were positively or negatively affected.

3.8. Alcoholic drinks industry

The theory of change hypothesised that the alcoholic drinks industry might make changes to product availability, size or alcoholic strength in response to MUP. It was also hypothesised that MUP could lead to changes in the economic performance of the industry, and that these changes might vary by sector, location or product mix.

Fourteen papers contained evidence relevant to the alcoholic drinks industry, of which nine were quantitative, two qualitative and three mixed-methods. After quality appraisal, ten of these papers were rated strong and four were rated moderate.

In the section on price, we concluded that there was limited evidence that the off-trade price of products above the MUP threshold had been affected. After MUP the price distribution of the off-trade alcohol sold clustered around £0.50 to £0.649 per unit and there was limited evidence of change (compared to before MUP in Scotland and to England & Wales after MUP) in the distribution at or above £0.65 per unit.

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Categories of alcoholic drinks that had the greatest increases in price post-MUP (mostly cider, perry and own-brand spirits) tended to see greater reductions in sales.[35,36,37,40,42,46,47] Categories of alcoholic drinks that exhibited smaller price increases or maintained their prices appeared more likely to maintain or slightly increase their sales.[40] These differential impacts on different categories are broadly supported by analyses of quantitative data on sales or purchasing,[34,35,46,47] particularly a reduction in purchasing of high-strength ciders, as well as increases in the promotion and purchasing of 'premium' spirits[36] (see **Consumption section**).

The evidence on the impact of changes in price and sales on revenues of retailers and producers is mixed. Quantitative analysis of sales data shows an overall increase in the monetary value of off-trade alcohol sales, with increases in sale price compensating for declines in sale volumes for retailers,[39] while the effect on producers' revenues was negative, but was considered by some, but not all, interviewees to be small.[37] While no participants in the qualitative interviews reported any changes in employment or facilities owing to MUP,[37,39] some reported that individual retailers had been affected adversely, with at least some of the variation likely to be due to the extent to which the products made/sold were affected by MUP.[39] Large retailers did not report any change in revenue or profits due to MUP, but convenience stores were more likely to have noted a decrease in revenue and profits, particularly if they previously relied on high-strength, low-cost alcohol products.[39] There was limited evidence that any potential increase in revenue for retailers had been passed on to producers.[37] While the sales data show an overall increase in revenue from alcohol, it was not possible to determine the impact on profit.[39] Analysis of quantitative data finds little evidence of MUP having material impacts on five key metrics of business performance* on any of the main sectors of the industry in Scotland.[39]

In terms of products and product range, there was little evidence of producers reformulating products to reduce ABV,[37,40] the extent to which any such observed

* The number of enterprises and business units; employment; turnover; gross value added (GVA); and output value.

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reformulation could be attributed to MUP was unclear,[37] and alcohol industry interviewees reported that it was more likely to be driven by consumer preference for lower-alcohol products.[39] There is evidence from quantitative analysis of purchasing data that MUP was associated with an increase in purchasing of low- and no-alcohol beer and cider, relative to higher-strength beer and cider[44] with a lower alcohol content, while purchases of the high-alcohol-content versions decreased. Changes to products may have been limited by the relatively small size of the Scottish market for UK and multi-national firms.[37]

There is qualitative evidence that smaller container and multipack sizes were introduced for some drink categories,[37] and although there was no evidence of any product (brand) in all its package variants disappearing entirely, there was some evidence that some retailers delisted larger sizes of brands that had experienced the largest increase in price per unit.[37,38] Following MUP implementation, sales of larger container/multipack sizes decreased,[37,40] particularly noticeable for cider sold in containers 1,000ml or larger (-61.3%) and multipacks containing more than 12 containers (-68.4%).[40]

Decreases in purchasing following MUP were greater in the off-trade than the on-trade,[40,47] with little or no significant change in on-trade sales[42,47] and producers reporting no change in the market share of the on-trade in response to MUP.[39]

Frontier Economics carried out interviews with retailers on either side of the Scotland–England border to gather insights into cross-border purchase. Retailers reported some evidence of Scottish consumers increasing cross-border purchasing, primarily within 15km of the border and close to major English towns, but no evidence of a substantial impact on profitability, turnover or employment of retailers in Scotland close to the border.[37] This finding was supported by both So and colleagues' qualitative interviews with representatives of Police Scotland[27] and Patterson and colleagues' quantitative analysis of turnover of off-trade licenses, which found no evidence of either systematic closures along the Scottish side of the border or openings along the English side.[51]

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Box 6: Alcoholic drinks industry summary

Overall, there is no consistent evidence that MUP impacted either positively or negatively on the alcoholic drinks industry as a whole. Sales data identified that an overall increase in the value of off-trade alcohol sales was seen, with increases in retail price offsetting declines in volume sales. While a reduction in producers' revenues was observed, this was considered in qualitative interviews to be minor. Little evidence was found of MUP having had an impact on key business performance metrics. There is some evidence that the industry responded to MUP by introducing new formats and packaging sizes.

3.9. Attitudes to MUP

The theory of change for MUP hypothesises that implementation of MUP may lead to changes in attitudes to MUP and social norms around alcohol. Changes in social norms may in turn impact on consumption and harm. However, most of the evidence on attitudes related to attitudes to MUP, rather than on social norms around alcohol more generally.

Ten papers contained evidence relevant to attitudes to MUP, of which two were quantitative, five qualitative and three mixed-methods. After quality appraisal, eight of these papers were rated strong and two were rated moderate. The relevant findings of each paper are listed in **Appendix C**.

One paper presented quantitative analysis of bespoke questions asked (in 2013, 2015 and 2019) through the Scottish Social Attitudes Survey, demonstrating that attitudes to MUP became more favourable over time.[59] In 2019, support for MUP was greater than opposition in each subgroup (deprivation quintile, sex, age). Older people and those living in the least deprived areas were more supportive than younger people and those living in the most deprived areas. Reasons for support were generally related to a belief that MUP would reduce consumption in some groups and address the harms associated with alcohol. Reasons for an unfavourable attitude to MUP were more varied although the majority related to doubts that the intervention would work, especially for those with alcohol dependence, and concern about the impact on the financially vulnerable.[59]

Another quantitative paper analysed the frequency of alcohol-related search queries originating in Scotland and England on an internet search engine in 2018 and

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demonstrated that the introduction of MUP correlated with peaks of interest in MUP, cheap sources of alcohol and online alcohol retailers in Scotland, but not England.[60] However, the interest was not sustained beyond the month of the introduction of MUP. The authors interpret this as evidence that MUP may have temporarily driven interest in acquiring cheaper alcohol.[60]

Eight papers (five qualitative, three mixed-methods) contributed qualitative evidence about attitudes to MUP. Five of these explored pre-implementation awareness of MUP, which was found to be low in those using alcohol treatment services[28] and varied among small retailers.[38] The heavy drinkers and young people that participated in So and colleagues'[27] focus groups were more consistently aware of MUP, although they exhibited misunderstandings about some elements of the policy. Professionals (e.g. licensing officers, police, health service providers) were typically aware of the policy, understood the rationale and supported it as a public health policy although there was some concern that retailers, not the government, stand to profit from the increased revenue.[18,27,52] After implementation, people that drink and have experience of homelessness were typically aware of the introduction of MUP and its impact on the price of certain products, but typically did not consider it to be a priority in comparison to other challenges they were facing.[19]

Across all subgroups studied, participants expressed doubts about whether MUP was able to reduce consumption in those considered to have alcohol dependence.[19,27,28,52,59] Participants who drink heavily, or have alcohol dependence, and those who provide services for them, expressed specific concerns about potential detrimental effects of MUP on the most deprived dependent drinkers.[28,52] Views were typically more positive about the likely impact for those that were not dependent and/or the potential to reduce alcohol dependence in the future.[28,52]

Stead and colleagues'[36] analysis of coverage of MUP in retail trade publications found that a variety of alcoholic drinks industry voices questioned the evidence underpinning the policy, and suggested that MUP was both an example of excessive government intervention and likely to lead to further such interventions. Critical stakeholders also questioned the evidence base supporting the policy.[36] However, industry stakeholders were not uniformly opposed to MUP in the retail press: some predicted that the policy would have positive impacts, and it was reported that many

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operators of bars and nightclubs called for the minimum price to be raised.[36] Frontier Economics'[37,39] case studies with retailers and producers of alcoholic drinks, conducted after implementation, found that participants had come to consider MUP as business as usual, but were concerned that increasing the minimum price would cause disruption, and about the potential for new policies such as Scotland's **Deposit Return Scheme (DRS)*** to interact with MUP.

Box 7: Attitudes summary

Quantitative evidence shows that, at a population level, the public were more supportive of MUP than not, with attitudes towards the policy becoming more favourable over time. The most common reason cited for supporting the policy was based on the belief that MUP would help to address alcohol-related harm while concerns about the effectiveness of MUP, potential negative impacts on the most deprived and the legitimacy of state intervention on individual behaviour were all cited as reasons for not supporting the policy. These views were largely echoed in the qualitative evidence. The view from the alcoholic drinks industry was typically, but not uniformly, opposed to MUP.

4. External factors as alternative explanations

This section considers the plausibility of some external factors as alternative explanations for our broad finding that MUP was associated with the key outcomes

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* The DRS as it is currently proposed would add a deposit of £0.20 on to every single-use drinks container, including each single item within a multipack and regardless of item size. The deposit would be refunded when the container is returned for recycling through an approved channel. DRS thus has the potential to interact with the MUP pricing structure at point of purchase. Lower-strength alcohol, such as beer and cider, are more likely to be sold in multipacks while higher-strength alcohol, such as spirits and wine, tend to be sold in single containers. There is a risk that DRS incentivises a move towards larger, single containers and higher-strength alcoholic products. The extent to which this will influence consumers' purchasing decisions and industry packaging is unknown.

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anticipated in the theory of change. The list of potential external factors was refined at the second engagement session with the help of stakeholders from the governance groups. When considering the likelihood of these as plausible explanations, two factors must be met:

- The extent of change in the external factor must be different in Scotland relative to England.
- The external factor must impact at the same time as MUP was implemented in Scotland.

4.1. Differences in comparator groups

The evaluation of public health interventions is complex. It can be valuable to compare outcomes to an appropriate comparator group when it is feasible to do so. If a comparator group (e.g. health harms from alcohol in England) is sufficiently similar to the intervention group (i.e. health harms from alcohol in Scotland), except for the presence of the intervention itself, then the comparator group can give an indication of what might have happened to the intervention group had the intervention, counter to the fact, never happened. In other words, under ideal circumstances, comparator groups allow researchers to compare estimates of what might have happened if the intervention never occurred to estimates from the intervention data. In studies evaluating MUP in Scotland, the comparator group generally took two forms: (i) outcomes in Scotland prior to the implementation of MUP; and (ii) outcomes from a geographical control group from other parts of the UK where MUP was not implemented (typically England, and sometimes specifically northern regions of England) both before, and after, the implementation of MUP. Many natural experiments evaluating the impact of MUP incorporated both before-and-after trends and multiple control groups, which further strengthen the analyses.

Control groups should be chosen on the basis that they are not subject to, or influenced by, the MUP policy and that they are similar to Scotland where the policy was implemented. Many studies in the evaluation of MUP have used outcomes from England to form the comparator group. England has not implemented MUP and is

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close in proximity, has a similar economy, culture, and population structure. In addition, data recording standards are closely aligned across UK nations, which further helps to reduce uncertainty related with coded outcomes.

It is important to acknowledge that, in social science studies using observational data such as those used to assess MUP, no control group could perfectly replicate conditions in the intervention group. It is also important to consider the potential impacts of differences in control groups compared to Scotland and whether on balance they are likely to be negligible differences. Parallel trends between Scotland and England from prior to the implementation of MUP increase our confidence that the choice of England as the control group is appropriate: from 2012 until the implementation of MUP in Scotland, alcohol-specific deaths followed similar trends in Scotland and England (**Figure 2**). Further, the statistical methods employed in several of the studies took account of the pre-existing trends and between-country differences which further increases our confidence that the direction and magnitude of any observed effect could be attributed to MUP. From 2020 and the subsequent COVID-19 pandemic period, there is increased uncertainty as alcohol-specific deaths in both Scotland and in England had increased.

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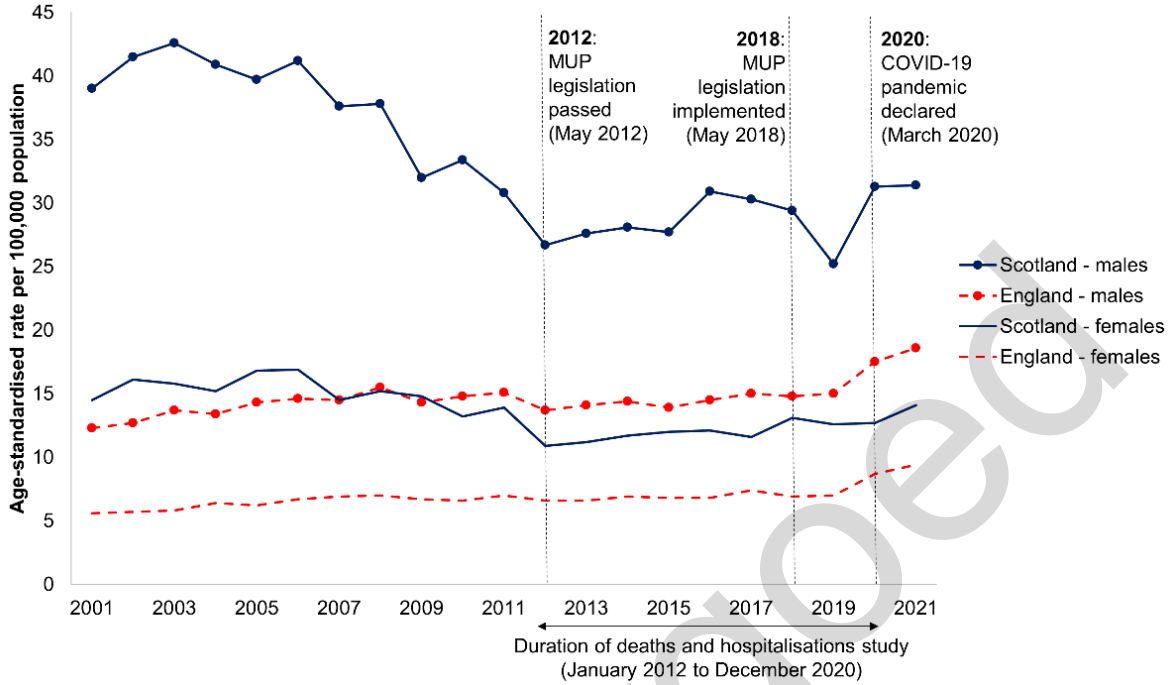
Figure 2. Alcohol-specific deaths in Scotland and England, by sex, 2001 to 2021



Source: National Records of Scotland and Office for National Statistics[61,62]

Several studies deployed multiple additional approaches to define comparator groups, such as incorporating data from England's northern regions, to stress test whether the observed effects were likely to have been caused by MUP or may have been artefactually influenced by the choice of the geographical control group. Findings were largely consistent when multiple different comparator groups were used, which helps to increase the confidence that findings could be causally attributed to the implementation of MUP in Scotland. Aside from undertaking these multiple approaches, no other more suitable alternative control group was identified throughout the design of these studies. In many of the studies which only incorporated outcomes from Scotland prior to the intervention as the comparator group (i.e. uncontrolled results that did not use any outcome data from other regions), the direction of the effects indicated that MUP had positively influenced outcomes.

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Summary: Studies evaluating MUP mostly used England, and regions of England, which are the best available control groups. Parallel trends in alcohol-specific deaths between Scotland and England, since 2012, prior to the implementation of MUP increases our confidence that changes can be causally attributed to MUP. Furthermore, observing the same findings when deploying different control groups increases our confidence that MUP caused these changes.

4.2. COVID-19 and related issues

From March 2020, restrictions were implemented in the UK to control the spread of COVID-19. The COVID-19 pandemic and associated restrictions could have affected data collection around MUP, as well as potentially affecting the outcomes of interest. Alcohol consumption patterns changed over the COVID-19 pandemic, with an increase in off-trade alcohol sales and a decrease in on-trade alcohol sales as pubs and restaurants were closed.[63] Although there was a population-level decrease in alcohol sales, changes in drinking were polarised, with those who drank more before the pandemic tending to increase their drinking, and those who drank less tending to decrease.[63] Alcohol-related health outcomes also changed during the pandemic, with an increase in alcohol-specific deaths and a decrease in alcohol-related hospitalisations, possibly because of changes in patterns of drinking and reduced access to services. These patterns were broadly similar in Scotland and England.

Between 0.6% and 3.4% of patients with COVID-19 also had liver disease.[64] COVID-19 can damage the liver, leading to more severe COVID-19 outcomes in people with existing liver disease, and exacerbating existing liver injury, particularly in those with cirrhosis.[65] If the control area had a higher rate of COVID-19 cases, it is possible that people in that area could be disproportionately susceptible to death from alcoholic liver disease. While most deaths among patients with chronic liver disease and COVID-19 tend to be from COVID-19-related causes, an international registry study found that 19% of deaths in such patients had a liver-related cause.[66] In 2020, in both Scotland and England & Wales, over 90% of all COVID-19-related deaths had COVID-19 as the main or underlying cause, with relatively few deaths where COVID-19 was a secondary cause.[67,68] However, the fact that routine population-wide COVID-19 testing was not in place in the UK in 2020, and the

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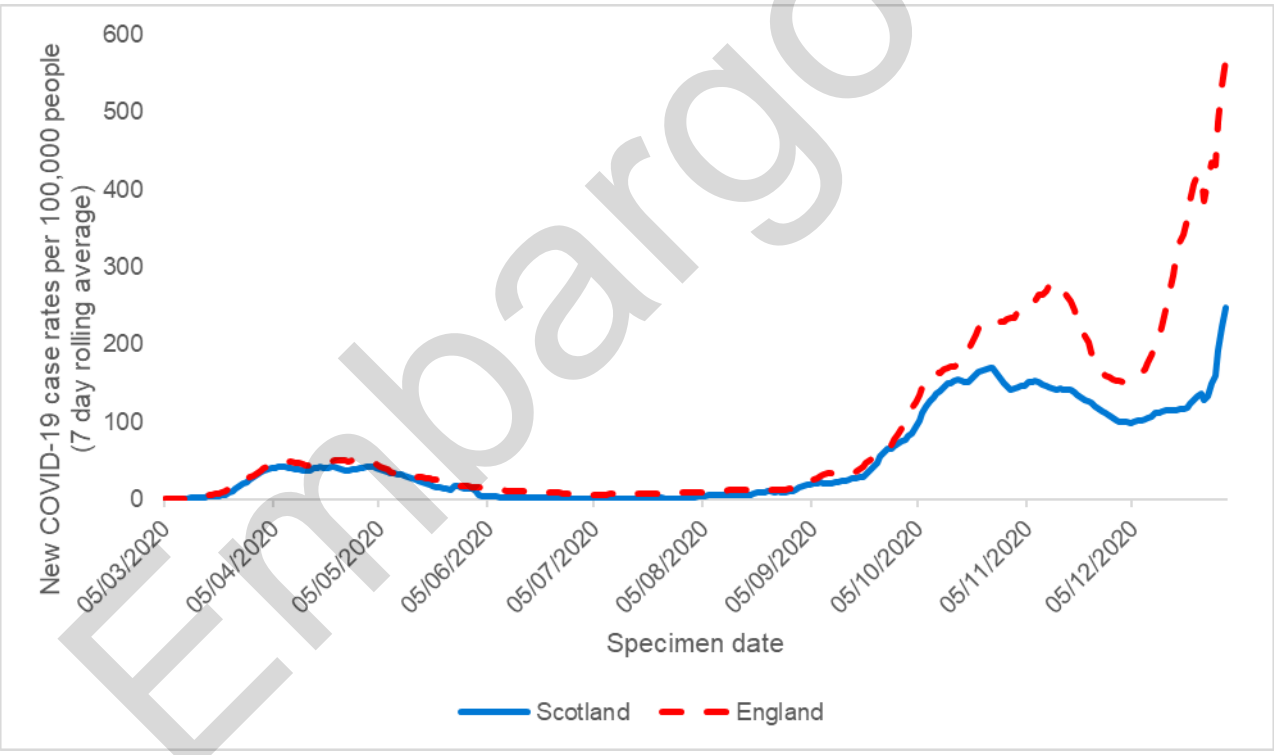
reduced access to services during the pandemic, means that COVID-19 may not have been diagnosed in many cases.

As **Figure 3** shows, the recorded rates of COVID-19 infections were only slightly higher in England compared to Scotland until around the start of October 2020, when the rates in England began to increase more steeply than Scotland. Since the study on hospitalisations and deaths included data up to the end of 2020, this difference between Scotland and England was only present for around three months of the study period.

Figure 3: New COVID-19 case rate by specimen date, seven-day rolling average, for Scotland and England, March–December 2020



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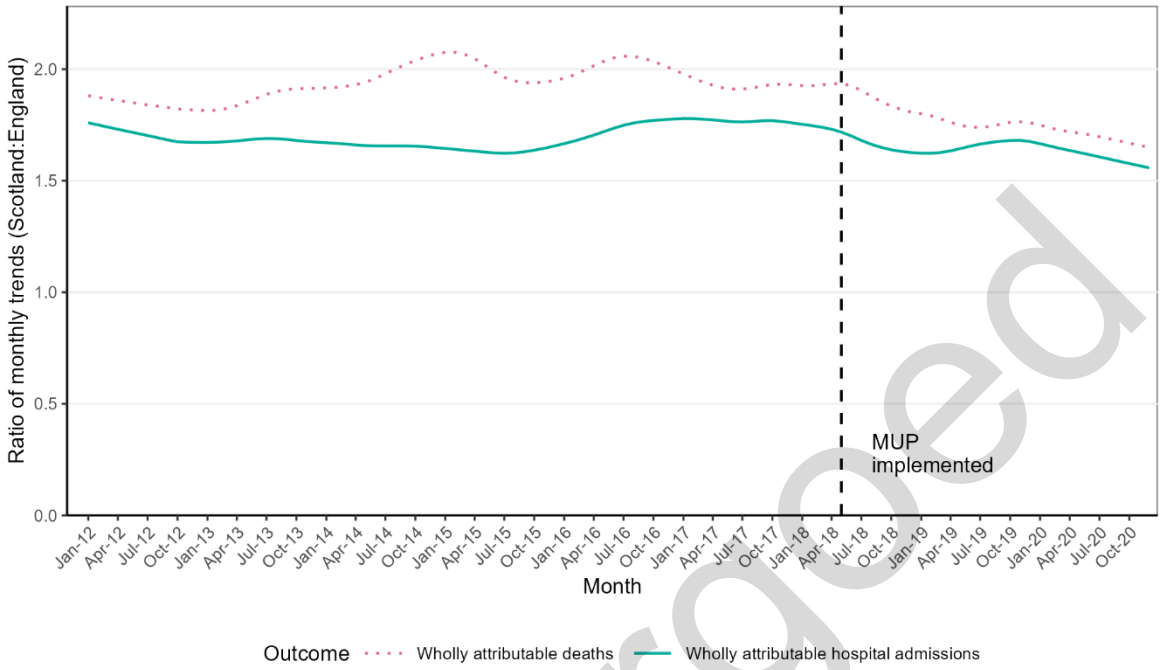
Source: Gov.uk[69]

If this differentially affected the rate of wholly attributable deaths in Scotland and England, we would expect to see a change in the Scotland:England ratio of monthly trend rates in late 2020, but the ratio continued to fall slowly and steadily from around the end of 2019 (**Figure 4**).

Figure 4: Ratio of monthly trend rates (Scotland:England) for wholly attributable deaths and hospital admissions, January 2012 to December 2020



Source: Wyper et al, 2023b[70]

Although the effect of direct damage to the liver from COVID-19 is likely to have a relatively small differential impact on alcohol-specific deaths between Scotland and England, there is much not known about the effect of COVID-19 and, because of limited access to services and COVID-19 testing, the extent of this may not be seen in national data.

Four studies reported shortening their data collection period to before, or just after the start of, the COVID-19 pandemic, to avoid the risk of the effects of COVID-19 and related public health measures distorting the impacts of MUP.[21,26,53,59]

Eight papers used data collected during time periods overlapping the nationwide stay-at-home order put in place to restrict the spread of COVID-19. In the case of five of these papers, the researchers asserted that their use of a controlled research design allowed them to adjust for any potential impact of the pandemic on alcohol purchases,[33,43,44] alcohol sales[47] or alcohol-related health outcomes.[25] All of these

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studies used a geographical control of northern England, England or England & Wales, areas which were also subject to COVID-19 restrictions. Studies on alcohol sales[47] and alcohol-related deaths and hospitalisation[25] also used the stringency index of the Oxford COVID-19 Government Response Tracker,[71*] to account for COVID-19 restrictions varying in Scotland and the control areas, noting that restrictions were similar in Scotland and England & Wales and therefore that England & Wales remained a suitable control area.[47] The studies on alcohol sales and hospitalisations also included sensitivity analyses truncating the study time period to before the COVID-19 pandemic and found similar results to the main result. Anderson and colleagues found that the differences between alcohol purchases in Scotland and northern England were not affected by the COVID-19 lockdown.[43] However, there may have been other impacts on health harms, such as different levels of access to treatment services, that were not fully captured in the Oxford COVID-19 Government Response Tracker.

Three studies used data that were collected at the time of the stay-at-home orders and were not able to adjust for its impacts, but did present plausible explanations of how the stay-at-home order may have affected their results. Two components of Patterson and colleagues'[51] analysis of the impact of MUP on cross-border purchasing were affected by the pandemic. Their analysis of survey data was partially based on data collected in March 2021, and the authors suggest that the finding that 14% of participants reported starting to buy alcohol online in the preceding year may have been inflated due to the stay-at-home order.[51] Their analysis of the financial feasibility of in-person cross-border shopping drew on fuel price data from May 2020, when fuel prices were relatively low due to the stay-at-home order, with the effect of making cross-border purchasing appear more

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* The stringency index of the Oxford COVID-19 Government Response Tracker is a score of 0–100, based on policies that restrict people's behaviour, such as school closures and restrictions in movement, as well as an indicator of public information campaigns. The index is produced separately for each of the four UK devolved governments.

financially feasible in their analysis than it would be subsequent to the stay-at-home order.[51]

Similarly, Frontier Economics'[39] quantitative analysis of impacts of MUP on the alcoholic drinks industry included survey data collected during the stay-at-home order, and expressed concern that those data may be lower quality due to a lower response rate. They identified various findings that could have been affected by the pandemic, including declines in the on-trade sector, which disproportionately occurred in 2020 and 2021. They conclude that their quantitative findings are likely to have been affected heavily by the pandemic.[39] Dimova and colleagues[18] note that participants in their interviews of homeless service providers sometimes found it difficult to disentangle the influence of MUP from the influence of COVID-19, particularly around health outcomes. Participants also mentioned the influence of COVID-19 directly, with some feeling that accommodation provided to homeless people during the COVID-19 pandemic mitigated the effect of MUP, since homeless people had more disposable income, and others thinking that COVID-19 reduced access to alcohol, making it more likely that people would seek treatment.

Summary: COVID-19 has had an impact on alcohol consumption. There is some evidence that COVID-19 can damage the liver and potentially exacerbate existing liver disease. There is no substantial evidence that either of these things have impacted in Scotland differently to England, although this is an emerging area.

Only a small number of studies included data collection during the COVID-19 period, and most used a geographical control which helped to account for COVID-19 restrictions. Studies that did not do this describe how their findings may have been affected by the pandemic. While studies which included data from the COVID-19 period took appropriate steps to minimise the impact of the pandemic and associated restrictions on their outcomes, the impacts of COVID-19 are a developmental area with a lot still unknown. Those studies which employed a controlled design are likely to account for the impacts most successfully.

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4.3. Alcohol treatment

Fully understanding how alcohol treatment service delivery differs between Scotland and England, and how that may impact on the effectiveness of that treatment, is a complex matter beyond the scope of this evaluation. In addition, the incidence of alcohol dependence is historically known to be higher in Scotland than England, meaning that demand for services will not be equal and local areas may have developed specific services to meet local need.

Differences in data collection systems between countries and over time make it difficult to reliably compare trends in the number of people accessing treatment services for alcohol in Scotland and England. Despite this, we have not identified any particular, widespread changes to alcohol treatment policy that would coincide with the implementation of MUP. The Scottish Government has set up an Expert Group for Alcohol Treatment Target to inform new alcohol treatment targets that are planned for spring 2024. As part of its work, this group will consider sources of alcohol treatment data in Scotland to better understand the current treatment landscape.

Summary: A full assessment of differences in alcohol treatment service delivery and the complex landscape that it sits in was beyond the scope of this evaluation. Comparable data are not available to reliably understand if access to alcohol treatment services varied between countries over time. We therefore cannot completely exclude alcohol treatment as an alternative explanation for the observed impact on alcohol-attributable deaths and admissions. However, the timing of MUP and the observed impact on deaths and hospitalisations, coupled with the lack of any identified widespread change in alcohol treatment policy, make this less plausible as an alternative explanation.

4.4. Alcohol affordability

If differential trends in affordability are to explain any of the observed reduction in alcohol-related deaths in Scotland relative to England, then disposable income in Scotland would need to fall and/or alcohol prices rise in Scotland relative to England for some other reason than the implementation of MUP.

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Differences in disposable income between Scotland and England & Wales as the control area were taken into account in analyses of alcohol sales data. Where changes in disposable income (and substitution) were adjusted for, similar estimates to an unadjusted MUP effect on the total volume sales of pure alcohol were seen.[46,47] This provides reassurance that, at a population level, disposable income is not the driver of the decrease in sales. However, the greatest reduction in alcohol-related deaths was observed among those living in the most deprived areas; therefore it is important to consider whether this could be explained in part by changes in disposable income for this specific group.

Data were obtained from the Scottish Government (**Figure 5**) for the trend in disposable income distribution* for the 10th percentile (i.e. 10% lowest income households) in Scotland and England. These data show minor fluctuation in disposable income for this income category, in both Scotland and England. The figures are estimated for Scotland and England based on a survey sample.[72] As such, sampling variation means caution should be exercised in interpreting small year-on-year fluctuation. Furthermore, data are not available for 2020/21 owing to disruption caused by the COVID-19 pandemic, and since only two post-MUP datapoints are available at this stage, further research is necessary to track whether and by how much any change in disposable income contributes to any ongoing outcomes attributed to MUP.

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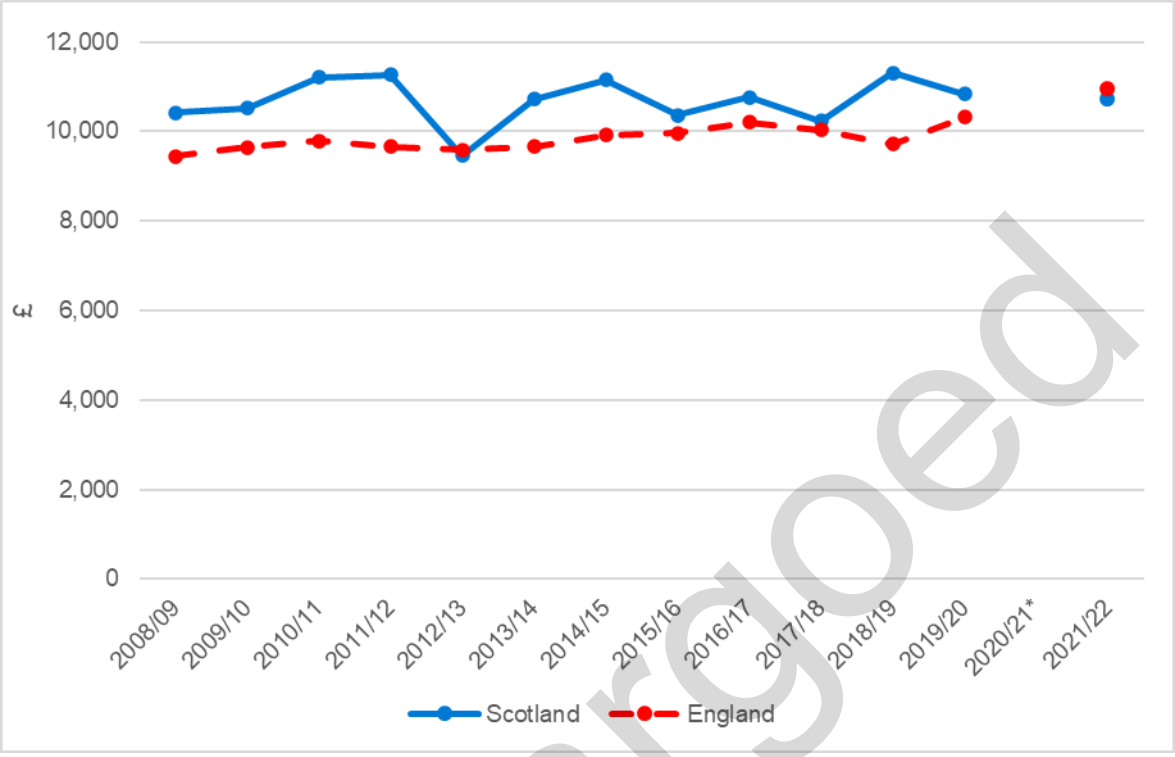
* Differential mortality data are provided by area level measure of deprivation (SIMD). Income data are provided by individual household level measure. There will be overlap between these two groups but they are not identical.

Figure 5: Annual equivalised income after housing costs (10th income percentile, 2021/22 prices in GBP)



Source: Scottish Government (unpublished data)

Exploring price differences is challenging because separate inflation indices are not calculated for countries or regions within the UK. Examining alcohol price distribution data[41] for both Scotland and England & Wales before and after the implementation of MUP suggests that MUP was the main driver of differences in the distribution of alcohol prices after MUP (**Figure 6**). In addition, pricing policies for many of the large retailers are set UK-wide so, other than the effects of MUP, alcohol price inflation would be expected to be similar in Scotland and England.

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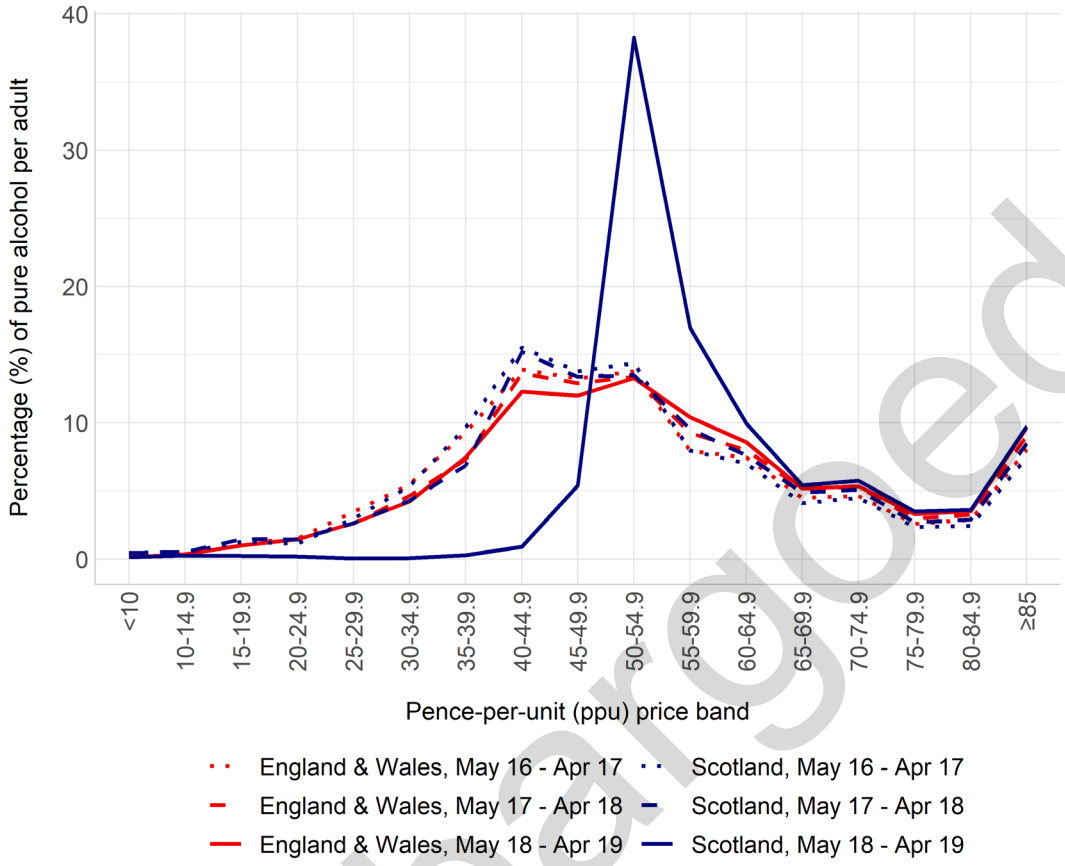
Figure 6: Estimated price distribution (%) of pure alcohol (litres per adult) sold in the off-trade, Scotland and England & Wales, May 2016 – April 2019



Source: Ferguson et al, 2021[41]

Summary: There is little evidence to suggest that a factor other than MUP was impacting on alcohol prices differentially in Scotland and England. Analyses of alcohol sales included adjustment for disposable income in Scotland and England & Wales and suggested disposable income had little impact. There is no conclusive evidence from other sources that disposable income changed differently in Scotland compared to England following MUP implementation.

4.5. Alcohol availability

Differential changes in alcohol availability in Scotland compared to England, due to different rates of change in alcohol outlet premises opening or ceasing trading, could have differential impacts on alcohol consumption and related harm. For example, Richardson and colleagues found that alcohol-related hospitalisations and deaths

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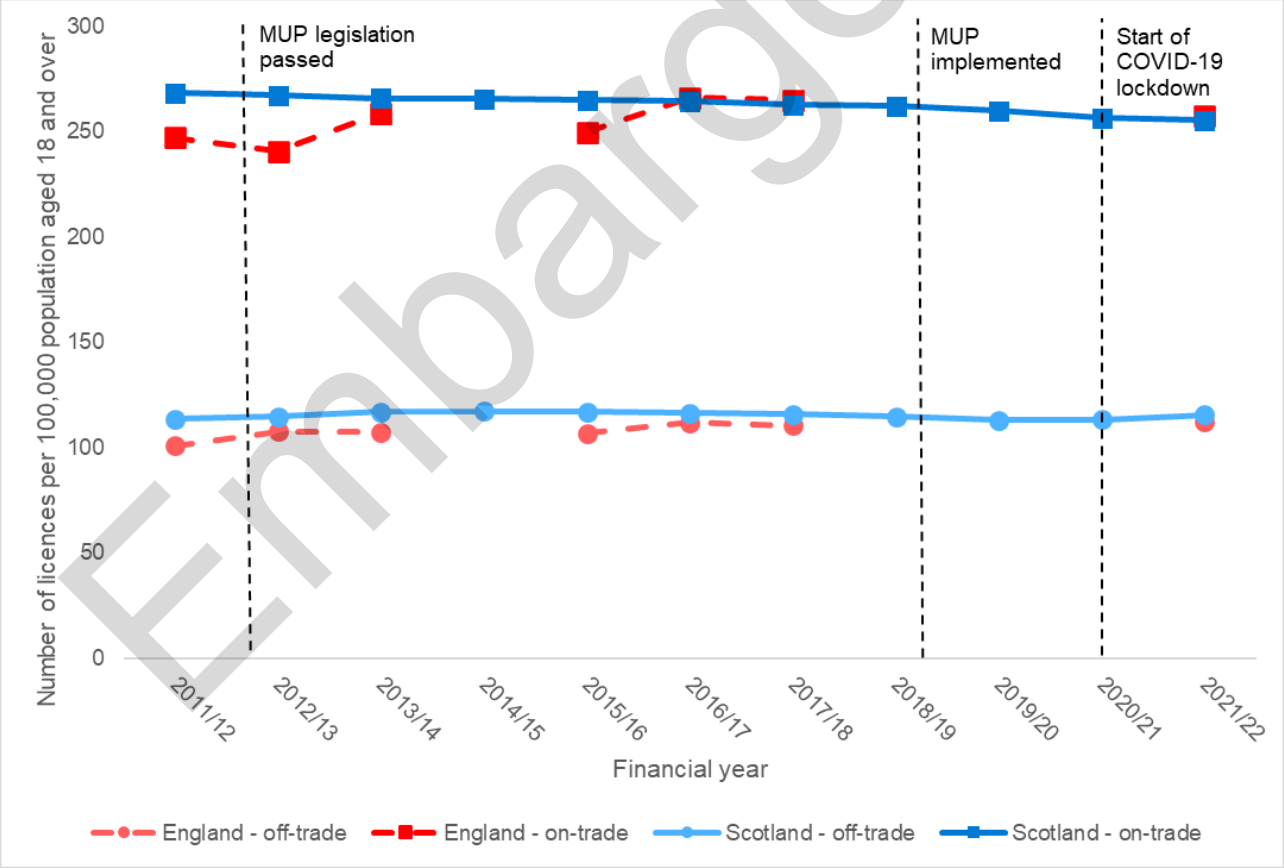
were higher in neighbourhoods with higher outlet densities, although the cross-sectional nature of the study made it impossible to infer causality.[73] Availability includes opening times, type of premises and size as well as number of outlets. However, only data on number of outlets is routinely available.

Figure 7 shows the number of premises licenses for the sale of alcohol as at the end of each financial year. Data are not available for England for 2014/15, and 2018/19 to 2020/21 (see note below chart). In 2021/22, there was little difference in the number of licences per capita for Scotland and England, for both the on- and off-trade sectors. This has stayed similar since 2017/18.

Figure 7: Number of premises licences per 100,000 population aged 18 and over, by trade sector and region, 2011/12 – 2021/22



Source: Licence numbers from Home Office[74] for England and Scottish liquor licensing statistics for Scotland.[75] Population figures from the Office for National Statistics[76] and National Records Scotland.[77]

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Notes:

- To minimise administrative burden on local authorities, data were not collected for years ending March 2015, 2019 and 2021 in England. Data were not collected for year ending March 2020 for England due to COVID-19.
- On-trade licences include premises licensed for both on- and off-trade sales. On-trade licences include those for members' clubs.
- Licence numbers are at 31 March for each financial year.
- Population estimates are mid-year estimates for the year to which the licence count refers (e.g. 2012 population estimates for 2011/12). Population estimates for 2022 were not available, and so 2020-based population projections were used.

Summary: The available data suggest that there is little difference in the number of licences per capita between Scotland and England for both on- and off-trade, and that this has not changed since 2017/18. The hypothesis that changes in alcohol availability could account for the observed changes in consumption or alcohol-attributable deaths and hospitalisations in Scotland relative to England is therefore not supported.

4.6. Alcohol licensing and public health

Since 2009, the alcohol licensing public health objective in place in Scotland (but not England) has required licensing boards to consider the impact of their decisions on the health of their population. Evaluation undertaken in 2012 concluded that licensing boards struggled to operationalise this objective. Implementation of the public health objective continued to be patchy and in 2017 much work remained for it to fulfil its potential. The Scottish Government published enhanced guidance in early 2023, too late to have impact within the evaluation study period.

In addition, licensing legislation in Scotland requires licensing boards to include a statement on overprovision in their licensing policy statement.[78] The overprovision statement draws on evidence of the extent to which alcohol-related health and social harm impact on the area and to make an assessment on whether licensed premises

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are overprovided in that area. As with the broader licensing public health objective, evidence that the inclusion of overprovision statements or defining a local area as overprovided is having an impact on alcohol consumption at a population level is limited.[79,80] We have not found any more recent evidence that overprovision is operating and impacting differently in Scotland and England in a way that would support the hypothesis that restrictions on overprovision account for the observed reduction in alcohol-related deaths and hospitalisations between May 2018 and December 2020 in Scotland relative to England.

Summary: There is little evidence to suggest that the public health licensing objective or the inclusion of overprovision statements in Scotland have been effective in reducing alcohol-related health and social harm. The hypothesis that these could account for the observed changes in consumption or alcohol-attributable deaths and hospitalisations in Scotland relative to England is therefore not supported.

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4.7. Ban on multi-buy discounts through the off-trade

Since October 2011 it has been illegal to offer multi-buy discount promotions (e.g. three for £10, buy one get one free) on alcoholic beverages sold in Scotland. This legislation does not apply in England or Wales. A previous study provided evidence that this was associated with a 2.6% reduction (95% CI= -5.3% to 0.2%, p=0.07), although it was non-significant, in population consumption (based on alcohol retail sales).[81] A follow-up study found no clear evidence of an impact on alcohol-related deaths and hospitalisations in the period following implementation.[*82]

We do not consider that a lagged time effect explains the reductions in deaths and hospitalisations in Scotland (compared to England) between May 2018 and December 2020. The amount of time that has passed between the implementation of the multibuy discount ban and the current finding makes it highly unlikely that the two are associated. In addition, in the study examining the impact of MUP on alcohol-attributable deaths and hospitalisations, the sensitivity analysis using a false implementation date six months prior to implementation found no effect. This therefore supports the hypothesis that the earlier ban on multi-buy discounts was not responsible for the reduction in deaths and hospitalisations found after the introduction of MUP.

Summary: There is no evidence that the multi-buy discount ban on alcohol products introduced in Scotland in 2011 could account for the reduction in alcohol-attributable deaths and hospitalisations in Scotland relative to England.

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[*] The most plausible explanation for these apparently differing results is most likely the type of products that each policy targeted. There is substantial evidence that MUP has targeted those drink types, primarily cider and spirits,[34,40,42] that are favoured by heavier drinkers and those on low incomes, whereas the ban on multi-buy promotions mostly affected wine. This is further supported by the finding that the greatest reductions in deaths and hospital admissions as a result of MUP were observed in the four most deprived deciles in Scotland.[25]

4.8. Alcohol Framework 2018

The Scottish Government published the Alcohol Framework[5] in November 2018 as an update to Changing Scotland's Relationship with Alcohol.[2] The framework contains 20 actions. While some progressed during 2019, the onset of the COVID-19 pandemic in 2020 delayed further implementation of the Alcohol Framework and the actions that would impact on alcohol consumption and related harms until beyond the timescale of the data in this evaluation.

Summary: The implementation of the Alcohol Framework did not coincide with the timing of MUP or the reported findings. The hypothesis that the Alcohol Framework could account for the findings is not supported.

5. Discussion

5.1. Key results

The main outcomes of interest for this evaluation are impacts of MUP on health and wider social outcomes, and on the alcoholic drinks industry. Compliance, price and consumption are used to evidence the theory of change and increase confidence that changes in the main outcomes can be attributed to MUP rather than being of interest in their own right. The key results for the main outcomes are summarised in **Table 3**.

In the two and half years following MUP implementation, there was a reduction of 13.4% in wholly attributable alcohol deaths in Scotland compared to England, as the control area. This was driven by reductions in chronic alcohol deaths, with the largest declines in men, those aged 65 years and over, and those living in the four most deprived deciles. There was a smaller (4.1%) reduction in wholly attributable hospital admissions. There were small increases in alcohol deaths and hospital admissions from acute causes. In terms of overall health harms from alcohol, acute causes account for a smaller proportion than chronic causes; 5% of the most recent annual alcohol-specific deaths were from acute causes. There was no evidence of any

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impact on other health indicators measured (ambulance callouts, emergency department attendances and prescribing for alcohol dependence).

There is lack of robust evidence that MUP had a detectable impact on a range of social outcomes: following the implementation of MUP, no increase or decrease in alcohol-related crime was detected and professionals working with children and young people affected by the drinking of other family members did not observe any positive or negative impacts of MUP. Evidence of substitution using non-beverage or illicitly distilled alcohol was scarce. There was evidence that some dependent drinkers reduced spending on food. There is some evidence that MUP may have exacerbated existing coping strategies such as begging and stealing in some homeless and street drinkers. At a population level there was no evidence of an impact on nutritional quality apart from a beneficial reduction in sugar from alcohol consumption.

There were qualitative reports of people who use drugs switching some of their alcohol consumption to greater illicit drug use, but it was generally unclear if these were linked to MUP, and quantitative analyses from four studies found no effect. There was no reported illicit drug use in those who did not use drugs prior to MUP.

The impact on the alcoholic drinks industry varied depending on the mix of alcoholic products produced/sold pre-MUP. Businesses predominantly producing or selling alcoholic products already priced at or above £0.50 per unit were largely unaffected. Those making or selling alcoholic products that were previously priced below £0.50 per unit have been affected. Overall, the impacts played out quickly and any reduction in sales value were largely offset by increased prices and margins for the industry as a whole. There were impacts on the industry in terms of changes in patterns of demand and price structures, but overall, negative impacts on performance* were limited and the qualitative case studies suggested in general that firms had moved on. Cross-border purchase was most likely by those living near the border. For some retailers the increase in price balanced the reduction in sales.

* The number of enterprises and business units; employment; turnover; GVA; and output value.

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Despite the reduction in alcohol sales, the increase in price meant that the value of sales overall increased, although not all businesses may have benefited. The impact on profits is unclear.

Table 3. Key results of the main outcomes

Study	Outcomes	Key relevant findings
Wyper et al, 2023[25]	Health outcomes: Alcohol deaths and hospitalisations	13.4% significant reduction in wholly attributable deaths. • Significant reductions for chronic causes, slightly offset with potential increases from acute causes. 4.1% reduction in wholly attributable hospital admissions. • Significant reductions for chronic conditions, slightly offset with potential increases from acute conditions. Largest reductions for men, and in those in the 4 most deprived deciles.
Manca et al, 2022a[26]	Health outcomes: Ambulance callouts	No evidence of impact.
Manca et al, 2023[21]	Health outcomes: Prescribing for alcohol dependence	No evidence of impact.
So et al, 2021[27]	Health outcomes: Emergency Dept attendance	No evidence of impact.
So et al., 2021[27]	Wider health and social outcomes: Prevalence of illicit drug use	No evidence of impact.

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Study	Outcomes	Key relevant findings
Iconic Consulting, 2020[31]	Wider health and social outcomes: Children and young people – own drinking and related behaviour	Limited impact of MUP: MUP was not perceived to impact on the alcohol-related behaviour of participants either positively or negatively, with no subsequent perceived impact on health and social harms such as illicit drug use and acquisitive crime.
Ford et al, 2020[52]	Wider health and social outcomes: Children and young people – harms from others	Those working with families affected by alcohol use expressed concern about whether those with alcohol dependence would reduce consumption and the impact on family budgets if that was the case. No specific examples were provided by those working with families affected by alcohol use of positive or negative impacts from MUP.
Holmes et al, 2022[28]	Wider health and social outcomes: Those drinking at harmful levels	There was no clear evidence found of any change in severity of dependence. Increased financial strain among some economically vulnerable individuals with alcohol dependence who maintain consumption, and some evidence of reduced spend on food. No clear evidence that it caused other wider negative consequences, such as increased crime, use of illicit substances or acute withdrawal.
Kopasker et al, 2022;[54] Leckcivilize et al, 2022[55]	Wider health and social outcomes: Impact on expenditure on food and nutritional quality	No evidence of effects on the quantity of food purchased, energy density or diet quality. Only category of nutrients that exhibited a statistically significant change due to MUP was a reduction in sugar from alcohol consumption, particularly in deprived areas and higher-alcohol-purchasing households.

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Study	Outcomes	Key relevant findings
Krzemieniewska-Nandwani et al, 2021[53]	Wider health and social outcomes: Impact on crime and disorder	Limited evidence of beneficial or detrimental impacts on crime including on non-alcohol-related crimes that might have been unintended consequences of MUP, such as drug-related crime.
Dimova et al, 2022[18]; Emslie et al, 2023[19]	Wider health and social outcomes: Homeless and street drinkers	Those working with homeless and street drinkers reported a range of impressions on whether MUP was positively or negatively associated with increased alcohol withdrawal and changes in consumption of spirits. There were some reports of increases in illicit drug use among those already using drugs to supplement alcohol consumption but there were conflicting views on whether this was attributable to MUP. Minimal changes were perceived in terms of theft or begging to acquire alcohol among this group of people.
Francesconi and James (2022)[56] Manca et al. (2022b)[57] Vandoros and Kawachi (2022)[58]	Wider health and social outcomes: Road traffic accidents	Evidence inconsistent. One paper found no evidence of impact, another paper reported evidence of an increase and a third paper reported evidence of a decrease.
Frontier Economics 2019[37]; Frontier Economics 2023[39]	Alcoholic drinks industry: Impact on the alcoholic drinks industry in Scotland	No evidence that MUP had significantly impacted the performance of the alcoholic drinks industry in Scotland in terms of the key metrics (turnover, output, GVA, number of firms, employment). Effects of MUP played out quickly and over the industry as a whole the impacts of falls in sales volumes were largely offset by increased prices and margins. The extent to which businesses were affected depending on the mix of products made/sold.
Frontier Economics 2019[37];	Alcoholic drinks industry:	Some evidence of Scottish consumers increasing cross-border purchasing, primarily within 15km of the border and close to major

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Study	Outcomes	Key relevant findings
Frontier Economics 2023[39]	Cross-border purchasing	English towns, but no evidence of a substantial impact on profitability, turnover or employment of retailers in Scotland close to the border.
Patterson et al, 2022[51]; Patterson et al, 2023[50]	Alcoholic drinks industry: Cross-border purchasing	Some evidence of cross-border trade, but only on a small scale, with cross-border purchase most likely by the small proportion of the population living near the border. For the majority of the population, distance from the border means that there is limited financial incentive for cross-border purchase.
Griffith et al, 2022[34]	Alcoholic drinks industry: Cross-border purchasing	Some evidence of cross-border trade, but only on a small scale, with cross-border purchase most likely by the small proportion of the population living near the border.
Holmes et al, 2022[28]	Alcoholic drinks industry: Cross-border purchasing	Those with probable alcohol dependence believed cross-border purchase to be an option but recognised it was reliant on access to transport.

Overall, the evaluation has provided strong evidence that MUP has averted a number of deaths related to alcohol consumption. There is also evidence that there has been a reduction in hospital admissions wholly attributable to alcohol consumption, although the presence of this effect was more uncertain. There was strong evidence of effect modification of MUP across subgroups; the largest reductions in deaths and hospital admissions wholly attributable to alcohol consumption were found for men and those living in the 40% most deprived areas. There was no evidence of impact on other health outcomes measured. There is no evidence of widespread health or wider harms, or significant costs to the alcohol industry or society in general. However, there is evidence that some people with established alcohol dependence with limited financial or social support, may have experienced harm, such as withdrawal, reduced expenditure on food or increased intoxication possibly from switching to spirits as a consequence of MUP.

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5.2. Populated theory of change

To illustrate the extent that the evidence supports or undermines the initial theory of change, we present a revised theory of change summarising the evidence relating to each step in the theory of change. **Figure 8** illustrates that the weight of evidence broadly supports the initial theory of change, with the key outcomes of MUP (including a reduction in alcohol-related deaths) being supported by evidence, and no clear evidence of substantial negative impacts on the alcoholic drinks industry or social harms at the population level.

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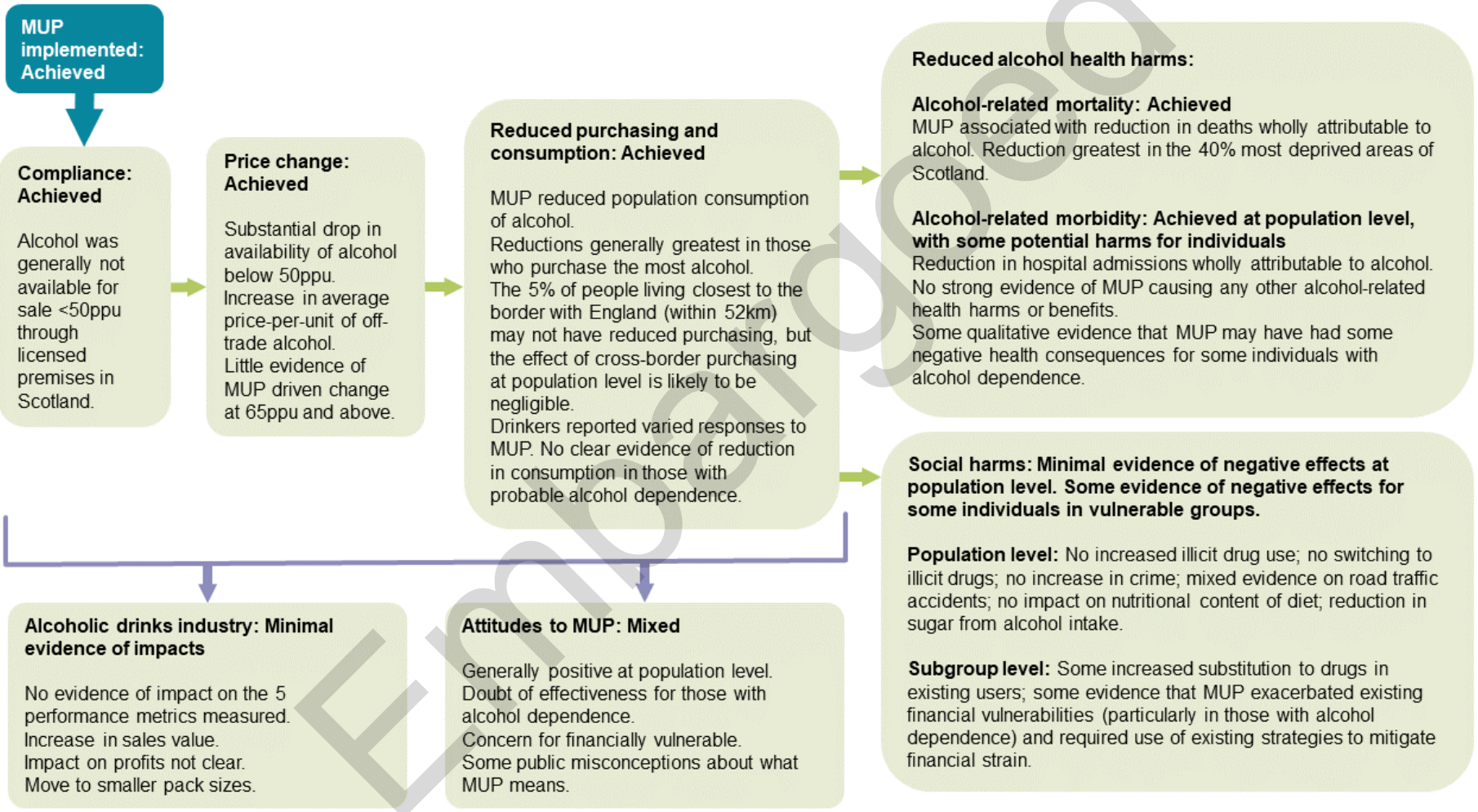
Figure 8: Populated theory of change of minimum unit pricing



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5.3. Strengths and limitations

The strengths of the overall approach to the evaluation are described in the evaluation protocol and can be briefly summarised as follows:

- Our use of a theory-based approach increases confidence in the conclusions on whether changes in intended outcomes are likely to be due to MUP rather than other confounding factors.

- Our portfolio approach allowed us to assess multiple outcomes in a variety of health, economic and social outcome areas as required by the MUP legislation.

- The deaths and hospitalisations study used a natural experiment design in which trends in Scotland were compared to trends in England where MUP was not implemented. Using England as a control in this way provides a counterfactual, an estimate of what would have happened in Scotland in the absence of MUP. Sensitivity analyses testing for (and finding no) change in outcomes at a false date different to the actual implementation date also strengthen the inference that changes observed were due to MUP. Several studies across the evaluation portfolio used a similar natural experimental approach.

- We developed a portfolio of studies to gather evidence on a number of outcomes, including both beneficial and potentially harmful impacts and, where possible, assessing differential impact.

- We developed mechanisms for ongoing wide stakeholder involvement in the governance groups which enabled a comprehensive and more nuanced understanding of context to inform the interpretation of data in individual studies.

- In preparing the final report we used systematic methods to find all studies on MUP in Scotland. Studies were quality assessed for inclusion by staff not

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previously involved with the PHS studies, and we commissioned another research organisation to validate that assessment.

- We developed a scoring system for the quality appraisal of studies and we were able to use a consistent, double-coded system to communicate relative scientific merit and determine any exclusions.

- Engagement with the governance groups and people with lived experience on the final report provided reassurance that the evaluation was considered comprehensive, alternative explanations for the findings had been considered and the interpretations/conclusions reasonable.

- We have considered and explored the plausibility of alternative explanations for the relative improvements in the alcohol-related deaths and hospitalisations observed.

The main limitations of the overall evaluation are as follows:

- MUP has been in place for a relatively short period. Continued evaluation over time will allow the evidence base to grow and it will be important to determine any change in the effects observed so far. This is an important research area to consider for the future.

- We have not undertaken modelling of the potential impact of future levels of the MUP, as this was beyond the remit of this evaluation.

- Employing a natural experiment design where possible is considered the gold standard for evaluation where it is not possible to randomly allocate individuals to an intervention or control group,[83] but there are limitations. Attribution remains complex because it is difficult to isolate the intervention from the contextual confounders in which it is implemented. The possibility remains that other external factors and other differences between the area of interest and the control area might contribute to the different outcomes observed. A final step in theory-based evaluation is therefore to consider external factors and alternative possible explanations for the differences in outcomes observed.

Embargoed

We do this in **chapter 4** above, and there was little evidence to suggest these alternative explanations were likely.

- One planned study, using the Scottish Health Survey to examine the impact of MUP on alcohol consumption in different population groups, did not conclude within the evaluation time period.* In order to add to the evidence base we recommend that the findings of this study be considered once complete.

The strengths and limitations of individual studies are described in the relevant study reports or journal papers (see **Appendix D** for links to the papers).

5.4. Interpretation

There is a wealth of economic theory and evidence that shows that, in general, as price rises, demand for goods falls. There is also substantial existing evidence that reduced consumption of alcohol improves health at an individual and population level. Studies which typically incorporate observational data on the relationship between prices, consumption and harms consistently show that policies that impact on price are effective in reducing consumption and related harm. The evidence that policies targeted at raising the price of alcohol, such as alcohol duty or minimum prices, reduce alcohol consumption, and thus alcohol-related harms, underpinned the theoretical case made for MUP before its introduction. The evidence generated through the evaluation of MUP in Scotland and that we have synthesised in this report is consistent with this previous evidence.

We have demonstrated that the expected chain of outcomes followed the implementation of MUP thereby increasing our confidence that MUP has contributed to the relative reductions in alcohol-related deaths and hospitalisations. We have considered a range of alternative explanations and consider most of these unlikely. For the remaining explanations, data limitations and the lack of robust evidence

* Lengthy delays in securing updated approvals for access to the necessary linked data have delayed completion of this study.

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mean that we cannot say definitively whether or not these have contributed to the outcomes observed. **Table 4** summarises the findings.

Table 4. Summary of potential alternative explanations

Potential alternative explanation	
Differences in comparator group	Unlikely to otherwise explain observed effects due to parallel trends in relevant outcomes prior to MUP implementation and the use of statistical methods to reduce relevant contextual differences.
Impact of COVID-19 on studies	Unlikely to otherwise explain observed effects as most studies did not use data from during the pandemic and the few that did took appropriate steps to mitigate the impact on their research.
Impact of COVID-19 on outcomes	Unlikely to be an important explanation but understanding of COVID-19 continues to grow and we cannot rule out some contribution.
Alcohol treatment	Unlikely to be an important explanation but data limitations mean we cannot rule out some contribution.
Alcohol affordability – price	Unlikely to otherwise explain observed effects as there is little evidence of price being affected by anything other than MUP.
Alcohol affordability – disposable income	Unlikely to be an important explanation but data limitations mean we cannot rule out some contribution.
Alcohol availability	Unlikely to otherwise explain observed effects as available data indicate little differences in the number of licences per capita in Scotland and England during the period of interest.
Licensing and public health objective	Unlikely to otherwise explain observed effects due to an absence of evidence that licensing practices in Scotland have changed in ways that would reduce alcohol harm.
Multi-buy discount ban	Unlikely to otherwise explain observed effects as the timing of the multi-buy discount ban does not align with changes in health outcomes in Scotland.

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Potential alternative explanation	
Alcohol framework	Unlikely to otherwise explain observed effects as the timing of the alcohol framework largely did not align with the time periods analysed.

Previously, Boniface and colleagues[84] used the Bradford-Hill criteria[85] for determining causality* as a framework for assessing the likely effectiveness of minimum pricing† for alcohol based on existing evidence (prior to the implementation of MUP in Scotland). They concluded that all nine of the Bradford-Hill criteria for determining causality were met by the existing evidence. Maharaj and colleagues also found that minimum unit pricing was likely to result in improved alcohol-related hospital outcomes, with all nine Bradford-Hill criteria being met across a range of natural experimental and modelling studies.[30] We propose this strongly supports our assertion that it is reasonable to conclude that MUP has contributed to the relative reduction in alcohol-attributable deaths and hospitalisations.

It can be useful to consider the potential benefit of MUP to society in monetary terms, and to compare those to any potential costs. The main health and social benefits identified by the evaluation were the reduction in alcohol deaths and hospital admissions. There was no evidence of positive or negative impact at a population level on other health or social outcomes.

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* This uses nine criteria to determine causality: Strength of the association; consistency; specificity; temporality; dose-response; plausibility; coherence; experiment; analogy.

† This study considered the evidence on minimum pricing. This includes but is not confined to minimum pricing based on strength, such as MUP as it was implemented in Scotland.

We used the average annual number of deaths averted as estimated by Wyper et al[70] and the value of a prevented fatality (VPF)* calculated by the Department for Transport (DfT).[86] A systematic review of values of VPF recommends that a VPF from the relevant country be used if it exists.[87] Guidance issued by UK Government HM Treasury on how to appraise policies, The HM Treasury Green book,[88] uses the DfT VPF, and it has been used in other health economic evaluations.[89]

The DfT VPF is just over £1.9m per fatality at 2020 prices and we estimate the social value of wholly attributable deaths averted by MUP to be around £300m (**Table 5**), ranging from approximately £134m to £469m, as determined by the degree of uncertainty around the estimates of deaths prevented. These calculations represent the net monetary gain of the number of deaths averted overall, rather than considering the value of both the decrease in deaths from chronic causes and the increase from acute causes, separately.

Table 5. Value of prevented fatalities per average 12-month period

Deaths	Deaths prevented per year (lower and upper bounds)	Value of deaths prevented	Lower bound	Upper bound
Wholly attributable	156 (69 to 243)	£301,780,000	£133,549,000	£468,999,000
Partially attributable	112 (2 to 222)	£215,571,000	£3,680,000	£427,988,000

* Value for prevented fatality is defined as how much individuals are willing to pay for a very small reduction in the probability of death, paid for by forgoing the consumption of other goods and services. It is a measure of the value of reduced risks of death in the population as a whole arising from public policy decisions. It should not be interpreted as how much a (known) life is worth. (Colmer J. What is the meaning of (statistical) life? Benefit–cost analysis in the time of COVID-19. Oxford Review of Economic Policy. 2020 Sep 28;36(Supplement_1):S56–S63. DOI: **https://doi.org/10.1093/oxrep/graa022**)

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The benefits to society valued in monetary terms arising from partially attributable deaths prevented by MUP were approximately £215.5 million, ranging from approximately £3.6m to £428m, based on the uncertainty estimated by Wyper and colleagues.[70] The range may be wider for partially attributable deaths than has been reported, as previously outlined by the study authors.* This is because there is additional unreported uncertainty around the estimate for the number of the deaths prevented for causes partially attributable to alcohol, for reasons explained in the study on deaths and hospitalisations. However, even at the lower limit of the estimated gains and additional unrecorded uncertainty, on balance the value of the partial attributable deaths prevented in monetary terms is likely to be positive and therefore does not diminish the very substantial monetary value of the wholly attributable alcohol-related deaths prevented.

We also estimated a value for changes in hospital admissions using an estimate in a study which calculated the mean total cost of an admission to hospital after attendance at the emergency department.[90] Updating this value using the Bank of England inflation calculator[91] resulted in a value of £990.57 per admission at 2020 prices. We applied this to the estimated hospital admissions averted, and the lower and upper bounds (**Table 6**).[70] These calculations are net, taking into account both the large decrease in admissions for chronic causes and the much smaller increase in admissions for acute causes.

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* The upper and lower bounds for partially attributable deaths represent uncertainty generated when statistically modelling the data, and do not include the additional uncertainty from components that are required for modelling attributable fractions, for example relative risks. This does not impact the main estimate, but it is likely that these upper and lower bounds are a highly conservative estimate of the total uncertainty. Therefore, wholly and partially attributable estimates should not be summed together.

Table 6. Value of hospital admissions averted

Hospital admissions	Admissions prevented per year (lower and upper bounds)	Estimated savings	Lower bound	Upper bound
Wholly attributable	411 (-86 to 908)	£407,000	-£85,000	£890,000
Partially attributable	488 (-1220 to 2915)	£483,000	-£1,209,000	£2,175,000

Note: negative values indicate increased admissions and costs

The estimated averted costs for admissions for causes wholly attributable to alcohol are approximately £407,000 per year, and for admissions partially attributable to alcohol the estimated costs averted are £483,000 per year.* As with the mortality data, ranges are wide, and for partially attributable hospital admissions, this uncertainty is greater still. In both cases, however, the estimates suggest costs associated with alcohol-related hospital admissions will fall rather than rise and represent a very small proportion (around 1%) of the value of the reduction in deaths based on the central estimate. Therefore, the greater uncertainty around the magnitude and direction of the estimates of costs averted by avoiding hospital admissions does not undermine the core conclusion around the substantial value in monetary terms of the deaths prevented.

There are large benefits to society arising from the deaths prevented by MUP. Other studies were unable to detect any impact on other health outcomes, crime and disorder outcomes, or industry performance metrics and we did not value these outcomes.

The main direct costs of setting up MUP were those borne by the Scottish Government in drawing up and implementing the legislation and those borne by producers, retailers and regulatory authorities in complying with and applying the legislation. The HM Treasury Green Book on how to appraise policies and

* As with deaths, wholly and partially attributable admissions should not be summed.

Embargoed

programmes advises that the historical costs of setting up the legislation should not be included in appraisal of policy because they are sunk costs that would not be incurred in the future and so not relevant to decisions still to be made.

The Green Book advises that the costs of continuing to use resources that are already paid for should be incorporated as opportunity costs.[88] For MUP, such costs would include the costs of Licensing Standards Officers (LSOs)* responsible for continued monitoring of MUP compliance. MUP compliance checks have been absorbed into pre-existing alcohol licensing inspection and enforcement practice.[32] Similarly, the Scottish Government has civil servants working on MUP within the context of a broader portfolio of alcohol policy.

Our study on the impact of MUP on the alcoholic drinks industry in Scotland suggests that negative impacts on performance† were limited and the qualitative case studies suggested that in general firms had adapted to the cost of complying with and implementing the required changes in pricing and marketing at a £0.50 per unit MUP.[37,39]

Duffy and Snowdon have asserted that drinkers in Scotland have borne the 'cost' of MUP.[92] By assuming that in the absence of MUP, the revenue trends (in proportionate terms) observed in England would also have happened in Scotland, and comparing with the observed revenue trends, they calculated that consumers in Scotland have spent an additional £270m on alcohol over four years, i.e. £67.5m a year. This equates to around £14.77 per person in Scotland (aged 16 years and

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* The Licensing (Scotland) Act 2005 requires local authorities to appoint at least one Licensing Standards Officer (LSO) in their area. The role of the LSO includes providing information and guidance in relation to alcohol licensing; monitoring compliance with the legislation; and mediation in relation to complaints, problems or disputes with premises/neighbours.

† The number of enterprises and business units; employment; turnover; GVA; and output value.

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over) per year (around £0.28 per week). In policy appraisal this is regarded as a transfer rather than a 'cost' because the revenue has passed from consumers to the retailers (i.e. a cost to consumers but a benefit to retailers) and therefore do not make society as a whole better or worse off, although it is also important to note and consider these distributions of costs and benefits.

Griffith and colleagues explored distribution of the changes in consumption observed, noting that the largest falls in consumption were in the heavier purchasing households, with the 5% highest purchasing households reducing purchasing by nearly 15% whereas households in the bottom 70% of the drinking distribution did not show a significant change in either statistical or economic terms. They conclude that MUP targeted the heavier drinkers.[34]

There are few studies that carry out full economic evaluation comparing benefits to costs, but those that do often show that price-based policies are not only cost-effective (i.e. generate substantial benefits in relation to their cost, compared to other uses of resources) but in some cases are actually cost saving:[93] i.e. the cost of implementing the policy is less than the savings made. This is because such policies reach a lot of people and have low administrative costs.[94] The main drivers of the costs of implementing minimum pricing in Canada were administration, planning, monitoring and, accounting for most of the total cost, enforcement. Sassi and colleagues[95] considered minimum pricing to be cost saving when taking these costs and the observed benefits into account. They also argue that producers and consumers adjust to price-based policies by developing new products and changing consumption in ways that offset potentially negative consequences. The study on the impact of MUP on the alcoholic drinks industry supports that view.[37,39]

Overall, therefore, although we did not carry out a full economic evaluation, evidence from this evaluation as well as previous theory and evidence suggest that the balance of costs and benefits are favourable.

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6. Considerations for policy decision-makers

Whether or not MUP should be retained, and at what level the MUP is set, is a decision for policy-makers, who will need to weigh up the potential benefits and risks. If MUP continues, in order to maintain and further enhance the positive impacts, the following should be considered:

- The evaluation of MUP was conducted with MUP set at a consistent rate of £0.50 per unit of alcohol. It is likely that any beneficial impacts of MUP realised to date will only continue if the value of MUP compared to other prices and incomes is maintained. Increasing the value of MUP would potentially increase the positive impact on alcohol consumption and related harms, but any negative or harmful impacts might also increase.

- There is limited evidence to suggest that MUP was effective in reducing consumption for those people with alcohol dependence. Those with alcohol dependence are a particular subgroup of those who drink at harmful levels and have specific needs. People with alcohol dependence need timely and evidence-based treatment and wider support that addresses the root cause of their dependence.

- The evaluation has demonstrated that some people with alcohol dependence who have limited financial support may experience increased financial pressure as a result of MUP. Consideration needs to be given on how best to monitor the needs and provide services for those in this group to minimise the negative impacts of MUP. This would be particularly important if increases to the level of MUP are introduced. Strategies to do this should be informed by the evidence.

- Those under 18 years of age generally reported that MUP had not affected their alcohol consumption, largely because price was a relatively minor factor in their decision to drink alcohol. Alternative evidence-based approaches should be considered to reach drinkers below the legal age for purchasing alcohol.

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- Policy-makers should consider how new policies, such as the proposed Deposit Return Scheme, might interact with the MUP pricing structure.

7. Conclusions

This evaluation set out to answer two questions:

1. To what extent has implementing MUP in Scotland contributed to reducing alcohol-related health and social harms?

2. Are some people and businesses more affected (positively or negatively) than others?

With respect to the first question, this evaluation has demonstrated that MUP has contributed to reducing alcohol-attributable deaths and hospital admissions in Scotland relative to England. There was a 13.4% reduction in wholly attributable deaths, driven by reductions in deaths from chronic alcohol conditions. There was a smaller (4.1%) reduction in wholly attributable hospital admissions, again driven by reductions in chronic alcohol conditions. There were small increases in alcohol-attributable deaths and hospital admissions from acute causes. There was no evidence of population-level positive or negative impacts on a number of other health or social outcomes including alcohol-related prescribing, alcohol-related ambulance callouts, alcohol-related crime and drug-related crime. At a population level there was no impact on nutritional quality apart from a beneficial reduction in sugar from alcohol. The evidence of impact on road traffic accidents was inconclusive.

With respect to the second question, the estimated reductions in deaths and hospital admissions were largest among men and those living in the 40% most deprived areas in Scotland. The decline in alcohol consumption following MUP was driven particularly by reduction in the sale of alcoholic drinks in the categories most affected by MUP price increases. The products that experienced the largest price increase, namely cider, perry and own-brand spirits, had the largest fall in sales. In general, MUP appears to have had no substantial detrimental impact on any of the alcohol

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industry key performance metrics (the number of enterprises and business units; employment; turnover; GVA; and output value). Purchasing data suggest that the reduction in consumption was driven by the heaviest purchasing households, and the majority of households were not affected, meaning MUP was well targeted. The fact that MUP resulted in a decrease in alcohol-attributable deaths and hospital admissions related to chronic conditions also suggests that MUP has, by definition, reduced consumption in those that drink at hazardous and harmful levels. When asked through surveys or interview how MUP had affected their drinking, a variety of responses were given. Some reported reduced consumption. Others reported no change. For some this was because MUP had not affected the price of what they normally drank. Some with alcohol dependence said they had been unable to reduce their consumption. For those drinking underage, there appeared to be other more important drivers of beverage choice than price. Others, especially those with alcohol dependence who were also financially vulnerable, reported needing to use pre-existing harmful strategies more often, such as reducing spending on food and, for those who were also homeless, begging or stealing to cope with the price increase. Substituting illicit drugs appeared to be uncommon and confined to those who already used such substances.

Overall, the evidence supports that MUP has had a positive impact on health outcomes, namely a reduction in alcohol-attributable deaths and hospital admissions, particularly in men and those living in the most deprived areas, and therefore contributes to addressing alcohol-related health inequalities. There was no clear evidence of substantial negative impacts on the alcoholic drinks industry, or of social harms at the population level.

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Appendix A: Details of PHS MUP evaluation portfolio studies

Studies funded by the Scottish Government through PHS

Study name	Lead research organisation	Compliance	Price	Consumption	Health outcomes	Social outcomes	Alcoholic drinks industry	Attitudes
Dickie et al (2019)[32] **(Compliance)**	NHS Health Scotland	✓				✓		
Ferguson et al (2020)[59] (**Public attitudes to MUP)**	Public Health Scotland							✓
Ferguson et al (2021)[41] **(Price distribution of off-trade alcohol)**	Public Health Scotland		✓					
Ferguson et al (2022)[40]	Public Health Scotland		✓				✓	

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Study name	Lead research organisation	Compliance	Price	Consumption	Health outcomes	Social outcomes	Alcoholic drinks industry	Attitudes
(Alcohol products and prices)								
Ford et al (2020)[52] **(Children and young people – harm from others)**	Public Health Scotland			✓		✓		✓
Frontier Economics (2019);[37] Frontier Economics (2023)[39] **(Impacts on the alcoholic drinks industry)** **(Impacts on the alcoholic drinks industry)**	Frontier Economics	✓	✓				✓	✓
Holmes et al (2022)[28]	University of Sheffield with	✓	✓	✓	✓	✓	✓	✓

Embargoed

Study name	Lead research organisation	Compliance	Price	Consumption	Health outcomes	Social outcomes	Alcoholic drinks industry	Attitudes
(People drinking at harmful levels)	Figure 8 and University of Newcastle (Australia)							
Iconic Consulting (2020)[31] **(Children and young people: Own drinking)**	Iconic Consulting	✓	✓	✓	✓	✓	✓	
Krzemieniewska-Nandwani et al (2021)[53] **(Crime and disorder, public safety and public nuisance)**	Manchester Metropolitan University					✓		
Robinson et al (2021);[46] Giles et al (2021);[96] Giles et al (2022)[47]	Public Health Scotland			✓			✓	

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Study name	Lead research organisation	Compliance	Price	Consumption	Health outcomes	Social outcomes	Alcoholic drinks industry	Attitudes
Alcohol sales to estimate changes in population consumption								
Patterson et al (2022)[51] Patterson et al (2023)[50] **(Cross-border purchasing)**	Public Health Scotland			✓			✓	
Stead et al (2020)[36] Stead et al (2022)[38] **(Small retailers)**	University of Stirling; University of Sheffield	✓	✓			✓	✓	✓
Wyper et al (2023)[25] **(Deaths and hospitalisations)**	Public Health Scotland				✓			

Embargoed

Separately funded studies

Study name	Research organisation(s)	Compliance	Price	Consumption	Health outcomes	Social outcomes	Alcoholic drinks industry	Attitudes
University of Glasgow study on consumption (to be completed)	University of Glasgow							
Manca et al (2022a)[26] **(Ambulance callouts)**	University of Stirling; University of Glasgow							
Manca et al (2023)[21] **(Prescriptions)**	University of Glasgow				✓			
So et al (2021)[27] **(Hospital and unintended consequences)**	University of Glasgow and others	✓	✓	✓	✓	✓	✓	✓
Kopasker et al (2022)[54]; Leckcivilize et al (2023)[55]	University of Aberdeen; University of Glasgow					✓		

Embargoed

Study name	Research organisation(s)	Compliance	Price	Consumption	Health outcomes	Social outcomes	Alcoholic drinks industry	Attitudes
(Food expenditure and nutrition)								
Dimova et al (2022)[18]; Emslie et al (2023)[19] **(People with experience of homelessness)**	Glasgow Caledonian University	✓		✓	✓	✓		✓
McCann et al (2020)[15]; Kwasnicka et al (2020)[14] **(Daily survey)**	University of Glasgow	✓		✓		✓		

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Appendix B: Characteristics of literature included in the evidence synthesis

Publication details	Study design	Data	Outcome areas
Anderson et al (2021)[33] **Impact of minimum unit pricing on alcohol purchases in Scotland and Wales: controlled interrupted time series analyses** Peer-reviewed academic No funding reported Declaration of interest: interests declared	Controlled interrupted time series analysis of the medium-term impact of MUP on alcoholic drink purchases, using northern England as a control.	Details of alcoholic drinks purchases in Scotland and northern England in 2015–2018 (n=21,861 households) and the first half of 2020 (n=7,979 households). Data from Kantar Worldpanel, collected through barcode scanning.	Compliance; Price; Consumption
Anderson et al (2022)[43] **Impact of minimum unit pricing on shifting purchases from higher to lower strength beers in Scotland: controlled interrupted time series analysis, 2015–2020** Peer-reviewed academic	Controlled interrupted time series analysis of the impact of MUP on shifting purchases from higher- to lower-strength beers, using England as a control.	Data from Kantar Worldpanel, collected through barcode scanning 1 Jan 2015 – 31 Dec 2020.	Price; Consumption

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Publication details	Study design	Data	Outcome areas
No funding reported Declaration of interest: interests declared			
Chaudhary et al (2022)[29] **Changes in hospital discharges with alcohol-related liver disease in a gastroenterology and General Medical Unit following the introduction of Minimum Unit Pricing of alcohol: The GRI Q4 Study** Peer-reviewed academic No funding reported Declaration of interest: none declared	Retrospective, observational study of discharged and discharges with alcohol-related liver disease in a Glasgow hospital. No control group.	Routine medical records of 1,875 hospital inpatient discharges in the fourth quarter of the years 2015–2017 (pre-MUP) and 2018–2019 (post-MUP).	Health outcomes
Dickie et al (2019)[32] **Minimum Unit Pricing (MUP) for alcohol evaluation: Compliance (licensing) study**	Qualitative analysis of licensing practitioners' (LSOs, TSOs and police licensing officers) perceptions of how	Semi-structured individual telephone interviews (n=20) conducted between August and	Compliance; Social outcomes

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Publication details	Study design	Data	Outcome areas
Grey Funding: NHS Health Scotland/Scottish Government No declaration of interest	MUP was being implemented, whether it was being complied with, and whether there had been changes in sales of unlicensed alcohol in Scotland.	October 2018, with licensing practitioners.	
Dimova et al (2022)[18] **Alcohol minimum unit pricing and people experiencing homelessness: A qualitative study of stakeholders' perspectives and experiences** Peer-reviewed academic Funding: Chief Scientist Office Declaration of interest: none declared	Qualitative analysis of the perceptions of stakeholders that provide support services to people experiencing homelessness to explore the impact of MUP on vulnerable groups.	Semi-structured qualitative interviews with 41 professional stakeholders from charities, NHS, Police Scotland, Scottish Government, and local authority housing and social work departments. November 2020–April 2021.	Health outcomes; Compliance; Consumption; Social outcomes; Attitudes
Emslie et al (2023)[19] **The impact of alcohol Minimum Unit Pricing on people with experience of**	Qualitative analysis of the impacts of MUP on people with experience of homelessness.	Semi-structured qualitative interviews with 30 men and 16 women aged 21–73 who had recent experience of	Consumption; Social outcomes; Attitudes

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Publication details	Study design	Data	Outcome areas
homelessness: Qualitative Study Pre-print academic Funding: Chief Scientist Office Declaration of interest: none declared		homelessness and/or street drinking. Interviews conducted in Glasgow in October–January 2020 and August–October 2020.	
Ferguson et al (2020)[59] **Public attitudes to Minimum Unit Pricing (MUP) for alcohol in Scotland** Grey Funding: Public Health Scotland/Scottish Government No declaration of interest	Quantitative analysis of survey data to investigate public attitudes to MUP before and after implementation of MUP.	Data derived from questions about attitudes to MUP asked in the Scottish Social Attitudes Survey in 2013, 2015 and 2019. Sample (n=3,807) broadly representative of the adult population of Scotland.	Attitudes
Ferguson et al (2021)[41] **Evaluating the impact of minimum unit pricing (MUP) on the price**	Descriptive quantitative analysis of the change in the proportion of litres of pure alcohol per adult sold in	Nielsen's weekly off-trade alcohol sales records, covering all large retailers and a stratified random sample of 'impulse' retailers from	Price

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Publication details	Study design	Data	Outcome areas
distribution of off-trade alcohol in Scotland Grey Funding: Public Health Scotland/Scottish Government No declaration of interest	alcoholic drinks in different price bands in Scotland pre- and post-MUP, with England and Wales as a control.	May 2016 to April 2019. Off-trade alcohol sales were categorised into price bands based on price per unit of alcohol. These data cannot be used to assess compliance with MUP. Population estimates from NRS for Scotland and ONS for England & Wales.	
Ferguson et al (2022)[40] **Evaluating the impact of MUP on alcohol products and prices** Grey Funding: Public Health Scotland/Scottish Government No declaration of interest	Descriptive quantitative analysis of changes in the prices, product ranges and sales in Scotland following implementation of MUP, with England & Wales as a control.	Commercial market research data from May 2016–April 2019 for Scotland, England & Wales, including: NielsenIQ (sales data); Knowledge Gaps (product ABV data and price data) and SalesOut (wholesale price data).	Price; Alcoholic drinks industry
Ford et al (2020)[52] **The impact of MUP on protecting children and young people from parents' and carers' harmful**	Qualitative analysis of the impact of MUP on protecting children and young people from harms experienced as a	Focus groups (plus one telephone interview) with 42 practitioners in Scotland working with families, children and young people	Consumption; Social outcomes; Attitudes

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Publication details	Study design	Data	Outcome areas
alcohol consumption: A study of practitioners' views Grey Funding: Public Health Scotland/Scottish Government No declaration of interest	result of others' alcohol consumption.	affected by harmful alcohol use. Data collected in January–April 2019.	
Francesconi and James (2022)[56] **Alcohol price floors and externalities: the case of fatal road crashes** Peer-reviewed academic No funding declared No declaration of interest	Quasi-experimental.	Road Accidents Data (RAD) Nov 2009–Dec 2019 monthly records. This is the British official administrative source for all motor vehicle collisions (involving at least one personal injury) reported to the police and recorded using the STATS19 accident reporting form. The focus of the study was on fatal collisions.	Social outcomes
Frontier Economics (2019)[37] **Minimum Unit Alcohol Pricing: Evaluating the impacts on the alcoholic drinks industry in**	Multi-component, mixed-methods analysis of the impacts of MUP on the	In-depth interviews with decision-makers and managers at eight companies representing eight different categories of firms	Compliance; Price; Alcoholic drinks industry; Attitudes

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Publication details	Study design	Data	Outcome areas
Scotland: baseline evidence and initial impacts Frontier Economics (2023)[39] **Minimum unit alcohol pricing: Impacts on the alcoholic drinks industry in Scotland: Final report** Grey Funding: NHS Health Scotland/Scottish Government Declaration of interest: interests declared	alcoholic drinks industry in Scotland. Qualitative analysis of in-depth case studies of firms involved in retail or production of alcoholic drinks, intended to test a theoretical model of MUP's impact on industry. Qualitative analysis of interviews with retailers close to the Scottish/English border to analyse the effect of MUP on cross-border purchasing. Quantitative analysis of the Business Structure Database and the Annual Business Survey, both collected by Office of National Statistics.	involved with retail or production of alcoholic drinks between February and April 2019. Semi-structured interviews with 10 retailers located near the English/Scottish border, supplemented with relevant data from component 1 (date of interviews not specified).	
Robinson et al (2021)[46] **Evaluating the impact of minimum unit pricing (MUP) on off-trade**	Quantitative analysis (controlled interrupted time series analysis) of off-trade	Nielsen estimates of weekly off-trade alcoholic drinks sales in Scotland, England and Wales,	Consumption; Alcoholic drinks industry

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Publication details	Study design	Data	Outcome areas
alcohol sales in Scotland: an interrupted time-series study Giles et al (2021)[96] **Using alcohol retail sales data to estimate population alcohol consumption in Scotland: an update of previously published estimates** Peer-reviewed academic/Grey Funding: NHS Health Scotland/Scottish Government Declaration of interest: none declared	alcohol sales data to estimate the impact of MUP on population-level alcohol consumption in Scotland in the first 12 months of the intervention, using England & Wales as a control.	2013–2019. Some additional on-trade alcoholic drinks sales data for use in adjustment.	
Giles et al (2022)[47] **Evaluating the impact of minimum unit pricing on sales-based alcohol consumption in Scotland at three years post-implementation**	Controlled interrupted time series analysis of the impact of MUP in the first three years on the volume of pure alcohol sold in Scotland, by retailer category and by drink type,	Alcohol sales data in Scotland, England and Wales from commercial market research companies. January 2013 to May 2021.	Consumption; Alcoholic drinks industry

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Publication details	Study design	Data	Outcome areas
Grey Funding: Public Health Scotland/Scottish Government No declaration of interest	using England & Wales as a control.		
Griffith et al (2022)[34] **Price floors and externality correction** Peer-reviewed academic Funding: ESRC (Economic and Social Research Council) No declaration of interest	Difference-in-differences analysis of the impact of MUP on purchasing in Scotland, using England as a control.	Kantar WorldPanel Purchase Panel, with longitudinal data covering purchases from supermarkets, convenience stores and liquor stores from May 2016–January 2020.	Compliance; Price; Consumption; Alcoholic drinks industry
Holmes et al (2022)[28] **Evaluating the impact of minimum unit pricing in Scotland on people who are drinking at harmful levels** Grey	Multi-component, mixed-methods study of the impact of MUP on people drinking at harmful levels, including those with alcohol dependence, using England	1. Quantitative repeat cross-sectional researcher administered survey of inpatients and community-based treatment service users in Scotland (n=483) and England (n=223); qualitative interviews with participants in	Health outcomes; Compliance; Price; Consumption; Social outcomes; Alcoholic drinks industry;

Embargoed

Publication details	Study design	Data	Outcome areas
Funding: Public Health Scotland/Scottish Government Declaration of interest: interests declared	as a control where appropriate. 1. Mixed-methods analysis of impact of MUP on people accessing treatment services related to alcohol dependence; difference-in-differences analysis and qualitative interview analysis. 2. Qualitative analysis of the impact of MUP on people with or without alcohol dependence in the community, and their families and carers. 3. Controlled interrupted time series analysis of impact of MUP on health outcomes for people identified as drinking at harmful levels in primary care.	Scotland (n=49 and England (n=22) including those drinking cheap alcohol, using illicit substances, in poor health, who were economically vulnerable or who had dependent children; qualitative individual/group interviews with service providers (n=44 interviewees in Scotland, n=11 in England). Data collected in three waves: wave 1 (November 2017–April 2018), wave 2 (August 2018- February 2019); wave 3 (November 2019–March 2020). 2. Participant Action Research interview and focus group discussions with people in Scotland with and without alcohol dependence and their families in community settings (n=45). Timing of data collection corresponded with wave 1 and wave 2 from work package 1.	Attitudes

Embargoed

Publication details	Study design	Data	Outcome areas
		3. Market research data from Kantar and Alcovision (Scotland & England, n=110,361, 1 January 2009–29 February 2020).	
Iconic Consulting (2020)[31] **Minimum unit pricing (MUP) for alcohol evaluation: Children and young people: Own drinking and related behaviour** Grey Funding: NHS Health Scotland/Scottish Government Declaration of interest: interests declared	Qualitative analysis of the impact of MUP on CYP's own drinking and related behaviour.	Qualitative individual, paired and small group interviews with 50 CYP ages 13–17 that use alcohol, and interviews with 21 staff and volunteers who work with young people. Data collected from January–May 2019.	Health outcomes; Compliance; Price; Consumption; Social outcomes; Alcoholic drinks industry
Kopasker et al (2022)[54] **The effects of minimum unit pricing for alcohol on food purchases: Evaluation of a natural experiment**	Statistical modelling to estimate potential unintended impacts of MUP on expenditure on food, diet and health, using the north of England as a control, and	Kantar Worldpanel market research data of weekly food purchases in Scotland (n=1,987) and the north of England (n=6,064) from all types of outlets where food and drink are	Social outcomes

Embargoed

Publication details	Study design	Data	Outcome areas
Leckcivilize et al (2023)[55] **Nutritional impacts of minimum unit pricing for alcohol: Are there unintended diet consequences?** Peer-reviewed academic/Pre-print academic Funding: Chief Scientist Office; Medical Research Council Declaration of interest: none declared	adjusting for differences between the households in each group.	purchased to be brought home and made. Data covers approximately one year pre-MUP and one year post-MUP.	
Krzemieniewska-Nandwani et al (2021)[53] **Evaluation of the impact of MUP on crime and disorder, public safety and public nuisance** Grey Funding: NHS Health Scotland/Scottish Government	Quantitative analysis of the impact of MUP on crime and disorder, public safety and public nuisance, using Greater Manchester as a control.	Crime data recorded by Police Scotland and Greater Manchester Police from January 2015 to January 2020. Calls-for-service or incident data recorded by Police Scotland from January 2015 to January 2020. Nominal (victim and offender) data for Greater Glasgow from January 2015 to January 2020.	Social outcomes

Embargoed

Publication details	Study design	Data	Outcome areas
No declaration of interest			
Leon et al (2021)[60] **What online searches tell us about public interest and potential impact on behaviour in response to minimum unit pricing of alcohol in Scotland.** Peer-reviewed academic Funding: ESRC; National Research University Higher School of Economics, Moscow Declaration of interest: interests declared	Descriptive quantitative analysis of the impact of the introduction of MUP on the use of alcohol-related web search queries, using England as a control.	Microsoft data of all search queries made to the Bing search engine originating in Scotland and England in 2018. Representative sample of internet users.	Attitudes
Llopis et al (2021)[44] **Impact of price promotion, price, and minimum unit price on household purchases of low and no alcohol beers and ciders: Descriptive analyses and interrupted time series analysis of**	Quantitative analysis (inc. controlled interrupted time series) of the impact of price promotion, price and MUP on household purchases of low- and no-alcohol beers and	Household purchase data from Kantar Worldpanel in 2015–2018 and the first half of 2020 (until July).	Price; Consumption; Alcoholic drinks industry

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Publication details	Study design	Data	Outcome areas
purchase data from 70, 303 British households, 2015-2018 and first half of 2020 Peer-reviewed academic No funding reported Declaration of interest: interests declared	ciders, using northern England as a control.		
Manca et al (2022a)[26] **The effect of the minimum price for unit of alcohol in Scotland on alcohol-related ambulance callouts: a controlled interrupted time series analysis** Pre-print academic Funding: Chief Scientist Office No declaration of interest	Controlled interrupted time series analysis of the impact of alcohol-related ambulance callouts, using ambulance callouts to under-13-year-olds as a control.	Scottish Ambulance Service dataset containing all electronic patient clinical records of ambulance callouts in Scotland from May 2015–October 2021, including demographic information and indicators of whether a callout was alcohol-related.	Health outcomes

Embargoed

Publication details	Study design	Data	Outcome areas
Manca (2022b)[57] **Evaluating the effect of minimum unit pricing for unit of alcohol on road traffic accidents in Scotland: a controlled interrupted time series study** Pre-print academic No funding reported No declaration of interest	Controlled interrupted time series analysis of the impact of MUP on road traffic accidents in Scotland, using England & Wales as a control.	UK road traffic accident and casualty data from the road safety statistics division at the UK Department for Transport, containing data of all personal injury accidents on public roads reported to the policy from 2016–2019.	Social outcomes
Manca (2023)[21] **The effect of minimum unit pricing for alcohol on prescriptions for treatment of alcohol dependence: a controlled interrupted time series analysis** Peer-reviewed academic No funding reported	Controlled interrupted time series analysis of the impact of MUP on prescriptions for treatment for alcohol dependence. Similar prescriptions in England and methadone prescriptions in Scotland were used as controls.	Daily Scottish prescription data from the Scottish national prescribing information system from March 2014–March 2020. Monthly England prescription data from the English prescribing dataset.	Health outcomes

Embargoed

Publication details	Study design	Data	Outcome areas
Declaration of interest: none declared			
McCann et al (2020)[15] **Studying individual-level factors relating to changes in alcohol and other drug use, and seeking treatment following minimum unit pricing implementation** Kwasnicka et al (2020)[14] **An N-of-1 study of daily alcohol consumption following minimum unit pricing implementation in Scotland** Grey/Peer-reviewed academic Funding: Alcohol Change UK Declaration of interest: No declaration of interest (McCann et al 2020) / Declaration of interest: none declared (Kwasnicka et al 2020)	An N-of-1 study analysing daily alcohol consumption, drug use, and contacting treatment for alcohol dependence pre- and post-MUP. A mixed-methods research design that focuses on individual-level mechanisms of alcohol use, rather than the overall effects of MUP.	Twenty-five adults with current or recent history of alcohol dependence living in rural areas and intermediate-sized towns in the east of Scotland. Baseline surveys; daily ecological monetary assessment smartphone surveys (in three waves of 12-week survey periods); social network interviews; Delphi workshop.	Compliance; Consumption; Social outcomes

Embargoed

Publication details	Study design	Data	Outcome areas
The peer-reviewed academic journal publication reports a portion of the larger study reported in the grey literature report.			
O'Donnell et al (2019)[35] **Immediate impact of minimum unit pricing on alcohol purchases in Scotland: controlled interrupted time series analysis for 2015–18** Peer-reviewed academic No funding reported Declaration of interest: interests declared	Controlled interrupted time series analysis of the immediate impact of MUP on alcohol purchases, using England as a control.	Household purchase data from Kantar Worldpanel covering 5,325 Scottish household and 54,807 English households from 2015–2018.	Compliance; Price; Consumption; Alcoholic drinks industry
Patterson et al (2022)[51] **Evaluating the impact of minimum unit pricing (MUP) of alcohol in Scotland on cross-border purchasing**	Multi-component study using mixed-methods to evaluate the impact of MUP on cross-border purchases of alcoholic drinks:	1. Fuel costs from AA Fuel Price Report May 2020; population distribution data from May 2020. 2. Product price and ABV details collected from retailers' websites	Consumption; Alcoholic drinks industry

Embargoed

Publication details	Study design	Data	Outcome areas
Patterson et al (2023)[50] **Addendum (YouGov, 2023) to 'Evaluating the impact of minimum unit pricing (MUP) of alcohol in Scotland on cross-border purchasing'** Grey Funding: Public Health Scotland/Scottish Government No declaration of interest	1. Analysis of the financial feasibility of in-person cross-border purchasing based on analysis of fuel costs, journey distances and population distribution. 2. Analysis of the feasibility of circumventing MUP through online purchasing by analysing cost of purchase and delivery for different products and retailers. 3. Survey of online and in-person cross-border purchasing. 4. Controlled interrupted time series analysis of alcohol sales in the north of England, using the rest of England & Wales as a control.	for both delivery and 'click and collect' purchases. 3. Self-reported purchasing from sixteen questions in the YouGov Omnibus survey (n=1,007), weighted to be representative of all Scottish adults. 4. Nielsen weekly off-trade alcohol sales data (2013–2019), modified to accommodate absence of data on Aldi and Lidl. 5. Yearly data on name, location and type of licensed off-trade premises (2018–2020), from the councils of: Scottish Borders; Dumfries and Galloway; Carlisle District and Northumberland.	

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Publication details	Study design	Data	Outcome areas
	5. Assessment of pre- and post-MUP differences in near-border off-trade licenses.		
Rehm et al (2022)[49] **Differential impact of minimum unit pricing on alcohol consumption between Scottish men and women: controlled interrupted time series analysis** Peer-reviewed academic No funding reported Declaration of interest: interests declared	Controlled interrupted time series analysis of differential impacts of MUP on men and women's alcohol consumption, using England as a control.	Kantar Worldpanel Alcovision continuous retrospective online timeline follow-back diary survey of the previous week's alcohol consumption. 2015–2018; 53,347 women and 53,143 men.	Consumption
So et al (2021)[27] **Intended and unintended consequences of the implementation of minimum unit pricing of alcohol in Scotland: a natural experiment**	Design: Multi-component, mixed methods study of various intended and unintended consequences of MUP:	1. Anonymised administrative hospital data and primary interviewer-administered surveys with patients, covering three three-week waves (May 2018, September–October 2018 and February 2019).	Health outcomes; Compliance; Price; Consumption; Social outcomes; Alcoholic drinks industry;

Embargoed

Publication details	Study design	Data	Outcome areas
Peer-reviewed report in funder's journal Funding: NIHR Declaration of interest: interests declared	1. Repeat cross-sectional natural experimental analysis of the impact of MUP on attendees of emergency departments, using the north of England as a control. 2. Quantitative analysis of unintended impacts on MUP on alcohol source and drug use in people attending sexual health clinics, using the north of England as a control. 3. Qualitative analysis of the anticipated and observed experiences of professional stakeholders, young binge drinkers and older, at-risk heavy drinkers exposed to MUP, exploring perceptions of social, health and economic impacts.	2. Primary, attendee-completed anonymous paper questionnaires covering demographic information and alcohol consumption, administered in sexual health clinics in three waves (February 2018, September/October 2018, February 2019) (n=15,218). 3. Semi-structured interviews with 30 professional stakeholders in roles (25 pre-MUP, January–April 2018; 21 post-MUP, October 2018). Focus groups discussions with 105 binge drinkers and at-risk heavy drinkers (84 pre-MUP, March–April 2018; 68 post-MUP, October-November 2018).	Attitudes

Embargoed

Publication details	Study design	Data	Outcome areas
Stead et al (2020)[36] **Evaluating the impact of alcohol minimum unit pricing in Scotland: Observational study of small retailers** Stead et al (2022)[38] **Implementation of alcohol minimum unit pricing (MUP): A qualitative study with small retailers** Grey/Peer-reviewed academic Funding: NHS Health Scotland/Scottish Government Declaration of interest: interests declared The peer-reviewed academic journal paper reports on the qualitative portion of work package 2. The full study is reported in the grey literature report.	Multi-component, mixed-methods study evaluating changes in alcohol price, marketing practices and product range in small retailers due to MUP: 1. Quantitative analysis of product availability, characteristics and pricing in small retailers in Scotland. 2. A mixed-methods observational retailer audit of the availability, promotion and marketing of alcoholic drinks products in small retailers, and those retailers' experiences of MUP. 3. Analysis of retail trade press reporting on retailer experiences of MUP, and	1. Electronic Point of Sale (EPoS) data monitoring trends in product availability, product characteristics and pricing in 200 small retailers in Scotland. August 2018–April 2018 and May 2018–January 2019. 2. Retailer audit of 20 stores, recording information about product availability, promotion and marketing. Qualitative interviews with small retailers about their experiences of MUP implementation. October–November 2017, October–November 2018. 3. Qualitative content analysis of five UK-wide and three Scotland-specific retail trade publications, August 2017–April 2018 and May 2018–January 2019.	Compliance; Price; Social outcomes; Alcoholic drinks industry; Attitudes

Embargoed

Publication details	Study design	Data	Outcome areas
	changes to pricing and promotional activities.		
Vandoros and Kawachi (2022)[58] **Minimum alcohol pricing and motor vehicle collisions in Scotland** Peer-reviewed academic No funding declared Declaration of interest: none declared	Difference-in-differences econometric analysis of the impacts of MUP on motor vehicle collisions, using England & Wales as a control.	UK Department for Transport Road Safety Database data on the daily number of motor vehicle collisions resulting in death or injury in 2018. Annual population estimates and unemployment rates from the Office of National Statistics. Weekly unleaded petrol price data from the Department for Business, Energy and Industrial Strategy.	Social outcomes
Wyper et al (2023a)[25] **Evaluating the impact of alcohol minimum unit pricing on deaths and hospitalisations in Scotland: a controlled interrupted time series study** Wyper et al (2023b)[70] **Evaluating the impact of alcohol minimum unit pricing (MUP) on**	Controlled interrupted time series study analysing reductions in alcohol-attributable deaths and hospitalisations due to MUP, using England as a control group.	Routinely collected data on death and hospitalisations for causes attributable to alcohol consumption from prior to the intervention (January–April 2018) and after the introduction of MUP (May 2018–December 2020).	Health outcomes

Embargoed

Publication details	Study design	Data	Outcome areas
alcohol-attributable deaths and hospital admissions in Scotland. Peer-reviewed academic/grey Funding: Public Health Scotland/Scottish Government Declaration of interest: None declared, other than Scottish Government funding			
Xhurxhi (2020a)[42] **The early impact of Scotland's minimum unit pricing policy on alcohol prices and sales** Xhurxhi (2020b)[48] **Essays on the short-term impact of minimum unit pricing policy in Scotland** PhD thesis/Peer-reviewed academic No funding declared	Mixed-method analysis of the impacts of MUP on alcohol sales and consumption: 1. Examination of the impact of MUP on average price per unit of alcohol, litres of alcohol sold per adult and litres of alcohol sold per adult drinker. Differential impacts between premise type and category of drink are examined. Uses England & Wales as a control.	1. On- and off-premise yearly alcohol price and sales data from 2011–2019 from Nielsen and CGA strategy. 2. Scottish Health Survey and National Survey for Wales, 2016–2018.	Price; Consumption; Alcoholic drinks industry

Embargoed

Publication details	Study design	Data	Outcome areas
No declaration of interest (Xhurxhi 2020a)[42]; Declaration of interest: none declared (Xhurxhi 2020b)[48] The peer-reviewed academic journal article[42] reports the findings of the first chapter of the PhD thesis.[48] This paper uses market research data commissioned by, and previously used by, Public Health Scotland, and includes outcome measures previously calculated by Public Health Scotland.	2. Difference-in-differences analysis of the immediate impact of MUP on different self-reported measures of alcohol consumption. Differential impacts between different drinking behaviours and population subgroups are examined. Uses Wales as a control.		

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Appendix C: Relevant findings by outcome area

Each table in this appendix summarises the findings of each paper relevant to a specific outcome area. The first column of each table illustrates the quality appraisal score that the paper was awarded following internal and external quality appraisal processes, as described in **section 2.2**. One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score. Papers assigned a ‘Weak’ score were excluded from the evidence synthesis and are not included in the tables in this appendix, but are described briefly in **Appendix E**.

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Health outcomes

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
Chaudhary et al 2022[29] ✓	• In one hospital in Glasgow, weekly mean alcohol-related liver disease discharges reduced after MUP for: individual patients (reduced from 5.4 discharges by 1.3, -2.4 to -0.1, p=0.037); hospital episodes with active drinking (reduced from 4.5 discharges by 1.1, -2.1 to -0.2, p=0.025); individual patients with active drinking (reduced from 4.0 discharges by 1.2, -2.1 to -0.3, p=0.01).). No statistically significant change was observed across all hospital episodes (estimated reduction of 1.0 mean weekly discharges, -2.2 to 0.3, p=0.123). • A decrease was observed post-MUP in the proportion of presentations of alcohol-related liver disease with upper gastrointestinal bleeding (from 15.8% to 7.4%, p=0.02). No statistically significant changes pre-post-MUP were observed in the proportion of presentations of alcohol-related liver disease with ascites (45.2% to 47.8%, p=0.46), hepatic encephalopathy (21.2% to 24.3%, p=0.38), infection (15.4% to 10.7%, p=0.19) or variceal bleeding (6.6% to 4.4%, p=0.53). • The proportion of alcohol-related liver disease patients presenting with alcoholic hepatitis with a bilirubin concentration of >80 µmol/l significantly increased (from 75% to 84%, p=0.018). No significant changes were seen pre-post-MUP in mean bilirubin concentration (from 162 to 175, p=0.398), mean creatine concentration (from 81.3 to 74.6, p=0.101), median Maddrey’s discriminant function score (from 38 to 35.5, p=0.354), median MELD score (19 pre and post MUP) or median GAHS score (7 pre- and post-MUP) for these patients.

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Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
	• No significant difference in 90-day mortality rate (from 12.4% to 13.2%) or re-admission (from 48.5% to 54.4%) or the absolute number of patients discharged quarterly (from 14.7 to 13.0, p=0.242) were seen pre-post MUP. • These results were interpreted as evidence that there has been a trend towards a reduction in hospital discharges with alcohol-related liver disease, particularly for active drinkers. • The authors also acknowledge that, as the analysis was observational and not controlled, they cannot make causal inferences about whether the changes observed were due to MUP or other factors.
Dimova et al (2022)[18]	• Professional stakeholders presented conflicting impressions of whether MUP was associated with an increase in admissions due to alcohol withdrawal symptoms. An addictions nurse reported many more admissions related to withdrawals, while a representative of a homelessness organisation reported that, despite preparing to accommodate an increase in withdrawals, no increase materialised. • Some professional stakeholders linked increased consumption of spirits with acute intoxication, and reported increases in seizures, falls, head injuries and gastric bleeds.
Holmes et al (2022)[28]	• No significant differences pre-post MUP in either the level of alcohol dependence (wave 1 to wave 2, p=0.178, wave 1 to wave 3, p=0.415) or the health status (wave 1 to wave 2, p=0.582, wave 1 to wave 3, p=0.465) of service users in Scotland, relative to England. • Qualitative reflections that the reduced affordability of alcohol was a factor driving individual treatment-seeking. • Some qualitative participants expressed concern about increased (or more rapid) intoxication from switching from cider or beer to spirits in response to price increases.

Embargoed

Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
Iconic Consulting (2020)[31]	• Participants did not report any change in the nature or extent of alcohol-related health or social outcomes post-MUP.
Manca et al (2022a)[26]	• No significant evidence of change was observed in the number of alcohol-related ambulance callouts either when uncontrolled (step change: 0.062, 95% CI: -0.012 to +0.0135, p=0.091; slope change: -0.001, 95% CI: 0.001 to 0.000, p=0.139) or controlled against callouts for those under 13 years old (step change: -0.01, 95% CI: -0.317 to +0.298, p=0.951; slope change: -0.003, 95% CI: -0.008 to +0.002, p=0.257). • Both the adult and under-13 groups were similar in terms of sex distribution and deprivation, and there was no evidence of a significant decrease in alcohol-related callouts by age group, sex or deprivation level of the callout location. • This analysis was interpreted as providing evidence that there is no apparent association between the introduction of MUP and the volume of alcohol-related ambulance callouts.
Manca et al (2023)[21]	• There was no statistically significant evidence that MUP was associated with significant population-level changes in the volume (-0.027, -0.068 to 0.014, p=0.196), or trends (0.0; -0.001 to 0.000, p=0.707) in the volume of prescriptions for treatment of alcohol dependence. • There were no significant variations by socioeconomic group in the impact of MUP on prescribing for treatment of alcohol dependence. • Strong evidence of a small increase in the rate of new patients receiving prescriptions for alcohol dependence in Scotland (0.002, 0.001 to 0.003, p=0.002), but these findings were not robust to falsification testing and were described as unlikely to be indicative of causation.

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Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
So et al (2021)[27]	• No statistically significant evidence of differences in alcohol-related emergency department attendance after the introduction of MUP in Scotland, relative to England (OR 1.14 (95% CI: +0.90 to +1.44, p=0.272). • Strong evidence that the odds for emergency department attendees having at least one alcohol-related diagnosis increased by 25% post-MUP relative to England (OR 1.25, 95% CI: +1.00 to +1.57; p=0.046). This was driven largely by a reduction in this outcome in England post-MUP. • This analysis was taken as evidence of no beneficial impact of MUP on health harms as observed within emergency departments. • Professional stakeholders in qualitative interviews typically reported that they had observed no impact on health from MUP, though a small number presented anecdotal indications of improvements in health that may have been precipitated by MUP, and there was little evidence of short-term impacts on heavier drinkers relating to withdrawal.
Wyper et al (2023a)[25] Wyper et al (2023b)[70]	Wholly attributable deaths: • Strong evidence that MUP implementation was associated with a large reduction in deaths wholly attributable to alcohol consumption (13.4%; -18.4% to -8.3%, p<0.001) in Scotland, relative to England. This is estimated to be equivalent to an average of 156 (-243 to -69) wholly attributable deaths averted in Scotland per year. • Strong evidence that MUP implementation was associated with a large reduction in deaths from chronic causes wholly attributable to alcohol consumption (14.9% -20.8% to -8.5%, p<0.001) in Scotland, relative to England. This is estimated to be equivalent to an average of 186 (-253 to -119) deaths averted in Scotland per year. • MUP implementation was observed to be associated with an increase in deaths from acute causes wholly attributable to alcohol consumption by 6.6% (-13.7% to +31.8%, p=0.55) in Scotland, relative to England,

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Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
	but this association was not statistically significant. The observed increase is estimated to be equivalent to an average of 10 additional deaths (with possible changes ranging from three fewer to 23 additional deaths in Scotland per year). Wholly attributable admissions: • MUP implementation was observed to be associated with a non-significant reduction in hospital admissions wholly attributable to alcohol consumption (-4.1%; 95% CI: -8.3% to +0.3%, p=0.06) in Scotland, relative to England. This is estimated to be equivalent to 411 fewer admissions (-908 to +86) in Scotland per year. • Strong evidence that MUP implementation was associated with a reduction in hospital admissions for chronic conditions wholly attributable to alcohol consumption (7.3%; 95% CI: -9.5% to -4.9%, p<0.001). This is estimated to be equivalent to 622 fewer admissions (95% CI: -880 to -364) in Scotland per year. • MUP implementation was observed to be associated with a non-significant increase in hospital admissions for acute conditions wholly attributable to alcohol consumption (9.9%; 95% CI: -1.1% to +22%, p=0.08). This is estimated to be associated with an average of 146 additional admissions (with possible changes ranging from 65 fewer to 357 additional admissions. Partially attributable deaths: • MUP implementation was observed to be associated with a non-significant reduction in deaths partly attributable to alcohol consumption (8.4%; 95% CI: -16.2% to -0.2%, p=0.05) in Scotland, relative to England. This is estimated to be equivalent to an average of 112 (95% CI: -222 to -2) partly attributable deaths averted in Scotland per year.

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Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
	• Strong evidence that MUP implementation was associated with a large reduction in deaths from chronic causes partly attributable to alcohol consumption (12.7%; 95% CI: -21.4% to -3.0%, p=0.01) in Scotland, relative to England. This is estimated to be equivalent to an average of 160 (-281 to -39) deaths averted in Scotland per year. • MUP implementation was observed to be associated with a 7.8% (95% CI: -1.1% to +17.5%, p=0.09) increase in deaths from acute causes partially attributable to alcohol consumption in Scotland, relative to England, but this finding is uncertain due to the 95% confidence interval crossing zero. The observed increase is estimated to be equivalent to an average of 32 additional deaths (with possible changes ranging from 19 fewer to 83 additional deaths in Scotland per year). Partially attributable admissions: • MUP implementation was observed to be associated with a non-significant reduction in hospital admissions partially attributable to alcohol consumption by 3.4% (95% CI: -7.3% to +0.6%, p=0.09) in Scotland, relative to England. The observed reduction is estimated to be equivalent to 488 fewer admissions (95% CI: -2,195 to +1,220) in Scotland per year. • MUP implementation was observed to be associated with a non-significant 3.1% (95% CI: -10.1% to +4.5%, p=0.41) reduction in hospital admissions for chronic conditions partially attributable to alcohol consumption. • MUP implementation was observed to be associated with a non-significant 2.7% (95% CI: -5.4% to +0.1%, p=0.05) reduction in hospital admissions for acute conditions partially attributable to alcohol consumption. The observed reduction is estimated to be associated with an average of 163 fewer admissions (with possible changes ranging from 431 fewer to 106 additional admissions).

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Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
	Disease-specific outcomes: • In Scotland relative to England, MUP implementation was associated with significant reductions in deaths due to alcoholic liver disease and alcohol dependence syndrome, but not deaths due to liver cirrhosis. • The estimated impact on disease-specific hospital admissions varied, with MUP implementation being associated with significant reductions in admissions for alcoholic liver disease and alcohol psychoses in Scotland, relative to England. However, significant increases in admissions for alcohol dependence syndrome were seen in Scotland relative to England. No significant change was observed for admissions due to acute alcohol intoxication or alcohol use in Scotland, relative to England. Demographic moderators • Significant reductions in deaths wholly attributable to alcohol use were estimated among both males and females, and independently for those aged 35 to 64 and those aged 65 and over. • The estimated reductions in deaths wholly attributable to alcohol consumption were largest among the 40% most deprived areas in Scotland. • Hospital admissions wholly attributable to alcohol consumption were estimated to be subject to greater reductions among males, rather than females. • A non-significant reduction in hospital admissions wholly attributable to alcohol consumption was estimated for those aged 35 to 64, with weaker evidence of changes for other age groups. • Collectively these findings were interpreted as evidence that MUP has been effective in reducing alcohol-attributable health harms in Scotland, particularly for deaths due to chronic alcohol-related illnesses. While increases in acute outcomes for some groups offset these benefits, acute alcohol-related

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Author (quality rating)	Study findings pertaining to alcohol-related health outcomes
	admissions and deaths constitute a relatively small proportion of overall alcohol-related harm, therefore the overall impact on population health is estimated to be positive.

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Compliance

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to compliance and implementation
Anderson et al (2021)[33] ✓✓	• MUP produced an immediate change in the minimum price per gram of alcohol for which alcoholic drinks were sold in Scotland (compared with northern England), with all sales occurring at or above the minimum price per unit.
Dickie et al (2019)[32] ✓✓	• Interviews with licensing standards officers (LSOs), Police Scotland licensing officers and trading standards officers (TSOs) indicated that licensed premises had been largely compliant with MUP, and practitioners considered instances of non-compliance to be minor. Non-compliance was not an issue in the on-trade. • Instances of non-compliance were identified in both large and small premises, and were all resolved quickly. • Facilitators of compliance identified by interviewees included: the mandatory nature of MUP as a condition of license; the limited effect of a £0.50 per unit minimum price on on-trade, and the limited range of products affected in the off-trade; a perception among retailers that MUP increased revenue; the support provided by LSOs, TSOs and police; and resources provided by the Scottish Government and the Scottish Grocers’ Federation. • Short-term barriers to compliance may have included the short time between final announcement and implementation of MUP; limited provision of guidance for premises.

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Author (quality rating)	Study findings pertaining to compliance and implementation
	• Ongoing issues related to compliance may include difficulties that premises experience in calculating MUP and applying it to all relevant products; confusion related to promotions, the use of vouchers, and the use of 'dual pricing' in premises that sell to both the licensed trade and the public; and limits on LSOs' capacity to supervise compliance with MUP. • Collectively the interviews conducted were taken as evidence that MUP had been effectively implemented by licenced premises. • Prior to implementation, practitioners expected lower compliance among smaller off-trade premises than larger supermarkets due to expectations that supermarkets would have systems in place to ensure compliance.
Dimova et al (2022)[18]	• A few professional stakeholders working closely with homeless and street drinkers reported being aware of alcohol being available at below MUP prices to their clients via small independent shops.
Frontier Economics (2019)[37]	• An interview with one convenience retailer indicated that compliance costs and administrative burden for retailers were insubstantial. • An interview with a national UK-wide supermarket chain indicated that MUP had introduced a compliance burden, owing to the need to formulate Scotland-specific promotions.
Frontier Economics (2023)[39]	• Organisations interviewed reported making appropriate adjustments by regular review of price and promotional offers to ensure compliance. At the time the interviews were conducted (October 2021–March 2022), ensuring MUP compliance

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Author (quality rating)	Study findings pertaining to compliance and implementation
	was considered by interviewees to be standard practice for both those in the retail and alcohol production sectors.
Griffith et al (2022)[34] ✓	• In the year pre-MUP, just under 50% of transactions were below £0.50 per unit; whereas post-MUP around 40% were exactly at £0.50 per unit, with a negligible amount below £0.50 per unit.
Holmes et al (2022)[28] ✓ ✓	• 14.4% of survey respondents in Scotland reported that their average price paid per unit across all drinks in the previous week was at or below £0.50 per unit, following MUP implementation (November 2019–March 2020). • The proportion of participants reporting that they had purchased drinks for less than £0.50 per unit in the prior week reduced from 59.2% pre-MUP to 13.9% post-MUP (0.008; CIs not reported). • The researchers conclude that, while non-negligible proportions of participants reported purchasing alcohol below £0.50 per unit, these were generally reporting errors, as reported prices were typically very close to the MUP (e.g. £0.49 per unit). • Qualitative interview participants typically reported not noticing price changes, but there were some accounts of changes in prices and availability of certain products (particularly from cider drinkers) and one account of retailer non-compliance in a rural area.
Iconic Consulting (2020)[31] ✓ ✓	• Some evidence that under-18s share information through word of mouth or social media about which retailers sell drinks at the lowest prices, including information about retailers selling at below £0.50 per unit.

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Author (quality rating)	Study findings pertaining to compliance and implementation
McCann et al (2020)[15] (No quality appraisal score allocated – see **Technical Appendix** for details)	• Two participants reported having found alternative supplies for a specific white cider the pre-MUP price, suggesting that some outlets did not comply fully.
O'Donnell et al (2019)[35]	• There was no time lag identified in the changes to product prices in Scotland, suggesting that compliance was largely in place when MUP was introduced.
So et al. (2021)[27]	• Licensing authority stakeholders predominantly described high retailer compliance, both pre- and post-MUP. One stakeholder reported that a supermarket had already adjusted their pricing prior to implementation, and indicated that this was likely to be a common occurrence.
Stead et al (2020)[36] Stead et al (2022)[38]	• Almost all (estimated 97.6%) monitored products were sold at or above £0.50 per unit post-implementation. The minority of product sales below the threshold did not vary by SIMD area. • Retailer interviews suggested that small retailers took compliance seriously, saw non-compliance as a risk and generally found implementation straightforward, and any concerns typically abated by five to six months post-MUP. This was echoed by the findings of analysis of trade press. • Small retailers with prices set centrally (i.e. symbol groups) found implementation most straightforward, but non-affiliated retailers indicated that the £0.50 per unit price made calculations simple. • Wholesalers facilitated implementation by providing reminders and information.

Embargoed

Author (quality rating)	Study findings pertaining to compliance and implementation
	• Small retailers were typically unaware of having been assessed or inspected for compliance by authorities, though some checks were reported, and they varied in thoroughness. • A small number of small retailers related that they knew other retailers to be selling at less than £0.50 per unit, and one participating retailer reported having sold high-strength cider at less than £0.50 per unit to regular customers.

Embargoed

Price

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to price
Anderson et al (2021)[33] ✓✓	• An immediate impact of MUP was observed on the mean price per gram of alcohol purchased in Scotland, relative to northern England (0.747p per gram, CI: +0.744 to +0.761), which was maintained in 2020 (such that there was no difference between price post-MUP in 2018 and 2020; mean difference –0.019p per gram, 95% CI: –0.041 to +0.003). • Increases in the price paid per gram of alcohol following MUP occurred within the households that purchased the most alcohol, without any systematic variation by household income. • This analysis was taken as evidence that MUP was associated with an increase in the price of alcohol.
Anderson et al (2022)[43] ✓✓	• Post-MUP the price of beer with an ABV ≤3.5% decreased by 2.73% (95% CI: +1.74 to +3.72) in Scotland, relative to England. • Post-MUP the price of beer with an ABV >3.5% increased by 8.76% (95% CI: +8.68 to +8.84) in Scotland, relative to England.
Ferguson et al (2021)[41] ✓	• In the year following implementation of MUP, approximately two-thirds (65.3%) of off-trade alcohol sold in Scotland was in the £0.50 to £0.649 per unit price range. By comparison, in England and Wales approximately one third (33.6%) of off-trade alcohol sold was in this price range, and in the year prior to MUP in Scotland one-third was in this range (31.9%). • The price band that changed the most was £0.50 to £0.549 pence per unit, which rose from 13.9% of pure alcohol purchases in the year prior to MUP to 39.0% the year following MUP.

Embargoed

Author (quality rating)	Study findings pertaining to price
	• The proportion of alcohol sold at price bands at or over £0.65 per unit in Scotland in the year post-MUP (27.3%) was similar to that seen in England & Wales post-MUP (26.8%) and in Scotland in the year pre-MUP (24.0%). • The categories of drinks that saw the greatest changes in price distribution were those that had previously been sold at the lowest prices per unit: perry, cider, spirits, beer. • Categories of drinks that typically sold at or above £0.50 per unit pre-MUP (wine, RTDs, fortified wine) changed little in price post-MUP. • While the data analysed for this report cannot be taken as evidence of compliance with MUP legislation (owing to limitations in the methodology used to derive price distribution, specifically concerning misallocation of products to incorrect price bands), they were taken as the best available evidence of the impact of MUP on price distribution of off-trade alcohol sales.
Ferguson et al (2022)[40] 	• Average price of alcohol per unit in Scotland rose by 10% from £0.60 in the year prior to MUP to £0.66 in the year following MUP, primarily driven by price increases in supermarkets. Over the same time period, prices in England and Wales increased by 1.7% from £0.60 to £0.61. • In Scotland, average price per unit in the year following MUP increased for each product category, to varying degrees. Perry (+50.0%) and cider (+25.6%) increased most. Beer (+7.3%), spirits (+7.0%) and wine (+6.1%) increased moderately. RTDs (+4.3%) and fortified wine (+3.2%) saw the smallest increases. • Very few of the top 50 products in supermarkets or the top 50 products in convenience stores decreased in price, with the biggest decrease seen in Buckfast tonic wine in convenience stores (-3.1% in Scotland in the first year of MUP, and -1.8% in England & Wales).

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Author (quality rating)	Study findings pertaining to price
	• Supermarket own-brand spirits increased in price more than other spirits; the average price per unit of own-brand vodka increased by 18.5%, gin by 16.1% and whisky by 12.8%. • These analyses were taken as evidence that MUP was associated with a greater increase in the price of alcohol in Scotland than had previously been seen year-on-year and when compared to England, particularly for drinks that tended to be sold for less than £0.50 per unit.
Frontier Economics (2019)[37] ✓	• One retailer in Scotland estimated that MUP was associated with an increase of 5% in the price of alcoholic drinks. • One retailer in Scotland estimated that MUP was associated with an increase in the price of around 20 to 25 product lines, particularly ciders, spirits and budget wines. • One retailer that did not previously sell products below the threshold of £0.50 per unit reported not changing their prices as a result of MUP implementation.
Griffith et al (2022)[34] ✓	• Kantar household-level data indicated that price increases of products that were very cheap before MUP were in some cases in excess of 100%. Very little change was observed in products that were already priced above the price floor. • Average price paid per unit in Scotland increased by approximately £0.035 per unit after MUP, relative to England. Average price increases per unit were largest for ciders (£0.12), while spirits, beer and wine prices all increased by approximately the same amount (£0.07). • Increases in household expenditure on alcohol were predominantly in households that purchased the greatest quantity of alcohol, with no pattern associated with income. • MUP was associated with a substantial effect on the distribution of cider, spirits, beer and wine prices. Prior to MUP between 44% (beer) and 54% (spirits) of all transactions had previously been below the

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Author (quality rating)	Study findings pertaining to price
	threshold of £0.50 per unit. Following MUP implementation, the majority of this was sold at or around the £0.50 per unit price point with very little impact on prices above this.
Holmes et al (2022)[28]	• Pre-MUP implementation compared to three to nine months post implementation, an increase in the average price paid per unit of alcohol purchased in Scotland was seen (0.49p versus 0.60p), which was greater than change seen in England (from 0.50p to 0.59p) (p=0.011). • When examining the change between pre-MUP implementation and 18–22 months post implementation there was no statistically significant evidence of a difference in the change in average price paid per unit of alcohol purchased in Scotland (from 0.49p to 0.59p), compared to England (0.50p to 0.55p, p=0.054). • There is strong evidence that the proportion of alcohol reported to have been purchased for below £0.50 per unit reduced in Scotland, relative to England for the period comparing pre-MUP implementation to three to nine months post-MUP (p<0.0004). The equivalent analysis comparing pre-implementation to 18–22 months post implementation was not statistically significant after correction for multiple testing (p=0.008; a significance threshold of p<0.0004630 was used due to the application of Bonferroni correction). • In interviews with people who probably experience alcohol dependence, many participants typically reported that MUP had not affected the prices of the products that they prefer, and being aware of prices appeared to be related to the extent to which the price of an interviewee's preferred category of alcoholic drink was affected by MUP.
Iconic Consulting (2020)[31]	• Under-18s who purchase alcohol widely reported observing changes in product prices post-MUP, particularly in specific brands of alcopops, spirits and wine popular among young people. There was less awareness of changes in drinks that are less popular with young people (e.g. strong white ciders, beers).

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Author (quality rating)	Study findings pertaining to price
	• Young people noted that some of the most popular products among their age group had not increased in price (e.g. Buckfast, Dragon Soop – drinks that tended to be priced at or above £0.50 per unit pre-MUP, as verified by EPoS data).
Llopis et al (2021)[44] ✓ ✓	• In Scotland, following MUP implementation, an increase (relative to northern England) in the average price paid (pounds per litre) was seen for: ○ alcohol-free beer (0.814, 95% CI: +0.761 to +0.867) ○ beer less than 3.5% ABV (0.112, 95% CI: +0.062 to +0.161) ○ beer over 3.5% ABV (0.336, 95% CI: +0.320 to +0.352) ○ cider less than 3.5% ABV (0.248, 95% CI: +0.242 to +0.254) ○ cider over 3.5% ABV (0.863, 95% CI: +0.839 to +0.886). • There was a decrease in the price paid for alcohol-free cider (-1.493, 95% CI: -1.584 to -1.402).
O'Donnell et al (2019)[35] ✓ ✓	• In Scotland, post-MUP, a price increase of 0.64p per gram of alcohol (95% CI: 0.54 to 0.75), or a 7.9% increase of 5.1p per UK unit was seen, relative to northern England. No observed pattern associated with household income.
So et al (2021)[27] ✓ ✓	• In post-MUP focus group discussions, many participants reported not noticing changes in the price of alcohol. Those that did report noticing changes generally indicated that they were relatively small.
Stead et al (2020)[36] Stead et al (2022)[38] ✓ ✓	• Small retailers interviewed as part of the retailer audit reflected that many of their prices had not needed to be changed significantly. • Year-on-year increases were observed in the nominal average sales price per unit for cider non-multipacks (from £0.28 to £0.58) and perries (from £0.28 to £0.56) in small retailers in Scotland, each coinciding with MUP implementation, and largely consistent across retailer SIMD quintiles.

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Author (quality rating)	Study findings pertaining to price
	• There was also evidence of year-on-year increases in nominal average sales price per unit for cider multipacks (from £0.47 to £0.56) and beer non-multipacks (from £0.53 to £0.67), although many such products were already priced at or above £0.50 per unit pre-MUP. • An increase was observed in the proportion of products sold in most £0.05 per unit price bands above £0.50, particularly for the band £0.50 to £0.54 which saw a 5.3% increase, suggesting increased congestion of the number of products sold at, or just above, the minimum price. • A narrowing of the price differential between products previously selling for less than £0.50 per unit and those previously above £0.50 per unit was particularly evident among ciders, with some evidence for less pronounced narrowing in beer and spirits. • Little to no consistent evidence was observed of the price for any products or categories decreasing towards the £0.50 per unit threshold based on the nominal sale prices-per-unit in small retailers.
Xhurxhi (2020a)[42] Xhurxhi (2020b)[48] 	• For on- and off-trade sales combined, MUP was associated with an increase in the average price of alcohol per unit in Scotland of 4.4% (range between 3.4% and 12.6% with cider seeing the steepest increase (12.6%).

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Consumption

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
Anderson et al (2021)[33] ✓✓	• MUP led to an immediate reduction of 7.063 (95% CI: -6.656 to -7.470) purchased grams of alcohol per person in Scotland (relative to northern England), and reduced consumption was maintained throughout 2020 (7.570g; 95% CI: -7.262 to -7.878). • The intervention was not associated with a change in the frequency with which people purchased alcoholic drinks. • Changes in purchasing occurred across all categories of beverage, but reductions in grams of alcohol purchased were greatest in cider and spirits. • Reductions in grams of alcohol purchased and increases in household expenditure on alcohol were predominantly limited to the households that purchased the most alcohol. • Households that generally bought small amounts of alcohol following MUP saw negligible increases in expenditure on alcohol, particularly lower-income households. • The researchers conclude that MUP is a ‘powerful’ and ‘highly targeted’ policy that led to decreases in purchasing of alcohol, particularly in the households that purchase the most alcohol.
Anderson et al (2022)[43] ✓✓	Relative to England: • Volume of beer ABV ≤3.5% purchased (per adult per household per day that a household made an alcohol purchase) increased by 3.6 ml (95% CI: +3.3 to +3.9), or 43.6% (95% CI: +42.1 to +47.1).

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• Volume of beer ABV >3.5% purchased decreased by 40.3 ml (95% CI: -39.4 to -41.1), or 9.6% (95% CI: -9.4 to -9.8). • The proportion of total beer sales that were ≤3.5% (abbreviated by the authors as PCLAB) increased in absolute (1.009%; 95% CI: +0.983 to +1.035) and relative (10.9%; 95% CI: +10.6 to +11.1) terms. • Post-MUP increases in PCLAB were lowest in those households that had had highest pre-MUP PCLAB, which were typically the most-deprived and lowest-income households. • Households with relatively high pre-MUP PCLAB where the main shopper was aged ≥65 years showed the greatest post-MUP increase in PCLAB. • The researchers conclude that MUP is associated with an 8% reduction in purchases of grams of alcohol within beer, and with shifts in purchasing from higher-strength beer products towards lower-strength beer products. The extent to which a household shifts towards lower-strength beers increases the likelihood that MUP led to reductions in their purchases of alcohol within beer.
Dimova et al (2022)[18]	• Service providers that work with people experiencing homelessness typically did not report any change in service users' alcohol consumption post-MUP. However, some reported reductions in consumption among service users that drink high-strength, low-cost cider, who either switched to lower-strength ciders or higher-strength spirits or fortified wines. • The researchers conclude that their study found some evidence of shifts away from high-strength, low-cost ciders among people experiencing homelessness.
Emslie et al (2023)[19]	• For some with experience of homelessness, their alcohol consumption was not affected by MUP as their preferred drinks had not previously been sold below £0.50 per unit. Others

Embargoed

Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	reduced their alcohol consumption and/or changed from drinking strong white cider to drinking other categories of alcoholic drinks. • The researchers conclude that, from the perspectives of people with experience of homelessness, MUP had worked as intended for some, but had had negative impacts on a minority of people.
Ford et al (2020)[52]	• Participants from organisations working with families affected by harmful alcohol use suggested some people changed their purchasing patterns to attempt to continue consuming the same amount of alcohol, for example by shopping at supermarkets rather than smaller retailers. • Several focus group participants raised the possibility of people switching from strong white cider to vodka, with a likely reduction in alcohol consumption even though the strength of the products consumed was greater. • Participants noted that price increases helped some parents and carers to reduce their consumption. • Participants felt that MUP would not effectively reduce alcohol consumption in individuals with alcohol dependence, though they acknowledged that this may be contingent on the extent to which individuals use products that are affected by MUP. • The researchers concluded that service providers felt that the intervention may support some of those drinking at hazardous or harmful levels to reduce their consumption, although the impacts of MUP on those with alcohol dependence were anticipated to be limited.
Giles et al (2022)[47]	• After three years, MUP was associated with a relative reduction in sales of pure alcohol per adult in Scotland of 3.0% (95% CI: -4.2% to -1.8%).

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• The reduction was driven primarily by a 3.6% reduction in off-trade sales (95% CI: -4.8% to -2.5%), while sales through the on-trade did not change significantly. • The net reduction in off-trade sales reflects a 1.3% reduction in Scotland and a 2.5% increase in England & Wales over the same time period. • Analysing by category of alcoholic drink, there was strong evidence of net reductions in the volume of alcohol sold in perry (31.6%; 95% CI: -38.5% to -23.9%, p<0.001), cider (13.5%; 95% CI: -17.0% to 9.8%, p<0.001) and spirits (5.1%; 95% CI: -6.6% to -3.6%, p<0.001). • No statistically significant net changes in the volume of alcohol sold in wine or RTDs. • Strong evidence of a net increase in the volume of alcohol sold in fortified wine (13.4%, 95% CI: 7.4% to 19.7%, p<0.001). • The researchers conclude that MUP was effective in reducing the amount of pure alcohol purchased per adult at the population level in Scotland.
Griffith et al (2022)[34] 	• MUP led to a mean weekly reduction in purchasing of 0.6 (11.2%) units per adult. • MUP led to mean weekly reductions in the number of units purchased when buying alcohol (7.5%), and the probability that a household would choose to buy any alcohol (3.0%). • The largest reduction in units purchased in alcoholic drinks was from cider (31.7%), followed by spirits (13.1%), wine (7.9%) and beer (7.6%). • The number of units purchased per adult per week in products that were priced below £0.50 per unit pre-MUP fell by an average of 0.9. • There was no significant impact on purchasing by households that were in the bottom 70% in terms of quantity of alcohol purchased. Households in the 90th–95th percentile exhibited a 10.4% reduction in purchasing, and the top 5% of purchasers exhibited a 14.8% reduction.

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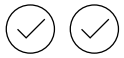
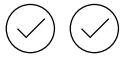
Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• The households that consumed more alcohol reduced their purchasing of products previously priced at below £0.50 per unit more than households that consumed less. • MUP was not associated with a significant reduction in the number of units purchased for the 5% of households closest to the Scotland–England border (equating to approximately 52km). • The researchers conclude that MUP is effective in targeting the consumption of the heaviest drinkers, while having negligible effect on the consumption of the bottom 70% of drinkers.
Holmes et al (2022)[28] 	• No significant difference pre-post MUP in average total spending on alcohol in Scotland, relative to England or the average price per unit of alcohol purchased in Scotland, relative to England. • No statistically significant evidence that the proportion of drinkers in Scotland consuming at harmful levels (>35/50 units f/m) changed relative to England (p=0.500) after the introduction of MUP. • Strong evidence that the proportion of drinkers consuming at hazardous levels (14–35/14–50 units f/m) in Scotland decreased significantly by 3.5 percentage points relative to England after the introduction of MUP (p<0.0005), but no statistically significant evidence of a change in the proportion consuming at moderate levels (<14 units) changed (p=0.269). • Statistically significant reduction pre-post MUP in the proportion reporting their first drink of the week was cheap alcohol (priced below £0.50 per unit) was seen in Scotland, relative to England. • No statistically significant difference pre-post MUP in average number of units consumed in Scotland, relative to England.

Embargoed

Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• No statistically significant evidence of a decrease in consumption of high-strength cider in Scotland (≥7.5% ABV) (25.0% at wave 1; 9.5% at wave 2 (p=0.204); 6.7% at wave 3 (p=0.470). These changes were non-significant at least partially due to similar declines in England. Qualitative evidence of instances where MUP led to small reductions in consumption, particularly through switching to products with lower alcohol content. • In qualitative interviews, some people who likely experience alcohol dependence reported that their consumption had been affected by MUP, while others felt that their consumption had not been affected as they already typically drank alcoholic drinks sold above the £0.50 per unit threshold. Some described mitigating price increases with strategies including cutting back spending on other products, switching drink category or borrowing money. • Some interview participants recognised cross-border purchasing as a way to mitigate the impact of MUP. Some reported having participated in cross-border shopping, or having observed others doing so, but they acknowledged that the benefit of cross-border shopping was contingent on having sufficient income and ability to travel.
Iconic Consulting (2020)[31] 	• No reports of young people changing how they acquired alcohol following the introduction of MUP. • Participants gave examples of CYP's consumption changing (both increasing and decreasing) post-MUP, although participants typically did not view price as a major contributor to purchasing and consumption decisions.
Llopis et al (2021)[44] 	• In Scotland, there was an 11.9% relative drop in the volume of purchased higher-strength beers (95% CI: -11.0 to -12.8), a relative 4% drop in the volume of purchased lower-strength beers (95% CI: -1.7 to -6.2), and a relative 54.7% increase in the volume of purchased

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	alcohol-free beers (95% CI: +52.8 to +56.8). Changes in all three categories of beers were larger in 2020 than in 2018 post-MUP. • For ciders, the equivalent changes were a 35.3% drop in higher-strength ciders (95% CI: -34.1 to -36.5), a 24% increase in lower-strength ciders (95% CI: +17.5 to +31.0, from a very low level of 0.2ml) and a 43.0% increase in alcohol-free ciders (95% CI: +38.5 to +47.7). In 2020, the decrease in higher-strength ciders was less than in 2018 post-MUP. Adjusting for cross-purchasing (ciders for beers, and beers for ciders) led to no significant changes in the size of the coefficient.
McCann et al (2020)[15] Kwasnicka et al (2020)[14] (No quality appraisal score allocated – see **Technical Appendix** for details)	• Factors related to daily alcohol consumption differed between individuals. Models suggested some individuals with high initial consumption reduced drinking after MUP, but explanatory factors differed (e.g. changing motivation, alcohol availability). • Some subgroups of people with alcohol dependence may be less affected by the 50p minimum price and those with fewer coping strategies may place themselves in debt or greater financial strain to obtain alcohol. • MUP did not appear to have much influence over patterns of alcohol consumption among those who were interviewed. Trend towards lower units per day post-MUP among some participants, but not all. • One participant reflected that their alcohol consumption had changed due to the MUP, switching from cider to lager post-MUP. • Both price and health benefits may act as motivators to change type or amount of alcohol consumed.
O'Donnell et al (2019)[35] ✓✓	• MUP associated with a reduction in Scotland of 9.5g (95% CI: -5.1 to -13.9; 1.2 UK units; 7.6% decrease) in weekly purchased grams of alcohol per adult per household.

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• The largest reductions were found for beer, spirits, and cider. • Across all Scottish households, MUP was associated with a non-significant relative increase in weekly expenditure on alcohol of 61p (95% CI: -5 to +127) per adult, per household. • Changes in weekly expenditure not systematically associated with household income but increased with amount of alcohol purchased.
Patterson et al (2022)[51] Patterson et al (2023)[50] 	• Most survey respondents (60%) had never bought alcohol online, and 54% of those who had, did so no more frequently than once a year. A minority (7%) of respondents buy online at least once a month. Of those who had ever bought alcohol online, 14% had started doing so in the preceding 12 months. • Of those that purchased online, 27% reported doing so for better value, but respondents more frequently identified choice (33%) and convenience (29%) as reasons. • 81% had never purchased alcohol in England in person. 18% had purchased alcohol in England and brought it into Scotland, while 5% reported having travelled to England for the sole purpose of buying alcohol. Reporting in-person cross-border purchasing was more common among the 11% of panel members that reported living within 60 minutes' journey from the border. • Note that the survey findings summarised in the preceding bullet points are taken from the survey conducted in March 2023,[50] but are broadly similar to findings from the previous wave of the survey from March 2021.[51] • Strong evidence of small relative increases in alcohol sales in north-east England (1.46%, 95% CI: +0.31 to +2.62, p=0.01), and larger increases for specific product categories, including cider (4.51%) and RTDs (5.85%). Strong evidence of a slightly smaller increase in total alcohol sales in north-west England (1.21%, 95% CI: +0.24 to +2.19, p=0.01).

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• Bulk purchasing would be required for cross-border purchasing to be financially beneficial for all but a negligible proportion of the population of Scotland. For example, in May 2020 a resident of Glasgow driving to Carlisle or Berwick-upon-Tweed would have had to spend between £63.45 and £309.30 (depending on the type of alcoholic drink product) to break even. • As of July 2020, eight of the 18 products examined could be bought below £0.50 per unit when purchased online, but retailers typically required bulk purchases of multiple bottles for those products, requiring an expenditure of £8.94–£170 depending on the type of alcoholic drink purchased. • The researchers conclude that cross-border purchasing is small relative to the overall purchasing behaviours of the Scottish population as a whole, but that there is a distance-based effect, with people living close to the border with England more likely to engage in cross-border purchasing.
Rehm et al (2022)[49] ✓	• There was a 6.2% drop in alcohol consumption in Scotland (relative to England) from the mean pre-MUP level (95% CI: -2.3% to -8.4%). Similar drop following sensitivity analysis with northern England. • Larger drop for heavier drinkers than lighter drinkers, excluding the top 5% of heaviest-drinking men, for whom MUP was associated with an increase in consumption. • Drops in consumption were greater in women than men. Women saw a reduction of 8.6g per week (95% CI: -2.9 to -14.3) compared to men's 3.6g per week (95% CI: -3.6 to -10.4). • Men's drop in consumption became smaller with decreasing age; younger men had no drop in consumption associated with MUP.

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	• Women's drop in consumption became smaller with decreasing age, but less so than for men. • No discernible patterns by social grade or deprivation group for either men or women based on ITS analyses. However, after secondary before and after analyses, the size of the associated drop in consumption for men became smaller with increasing deprivation, with men living in the most deprived areas having no associated decrease in consumption. For women, the associated drop in consumption also decreased slightly with decreasing deprivation score, although less so than for men.
Robinson et al (2021)[46] Giles et al (2021)[96]	• Strong evidence that MUP was associated with a reduction in total off-trade sales in Scotland, when controlling for sales in England & Wales, in both the unadjusted (-3.5%; 95% CI: -2.1% to -4.4%, p<0.001) and adjusted (-3.5%, 95% CI: -2.2% to -4.9%, P < 0.001) analyses. • Strong evidence that MUP was associated with a 2.0% (95% CI: -0.4% to -3.6%, p=0.014) reduction in off-trade sales per adult in Scotland, and a 2.4% (95% CI: +0.8% to +4.0%, p=0.004) increase in England & Wales. • In unadjusted, controlled analysis by beverage category, MUP was associated with reductions in off-trade sales of spirits, cider and perry in Scotland in the first year of MUP. There was null association between MUP and off-trade wine sales, and a net increase in off-trade sales of RTDs and fortified wine. These estimates did not change meaningfully after adjustment for on-trade sales, income and off-trade sales of other beverage categories, excluding wine, for which MUP was associated with a net increase in sales.
So et al (2021)[27]	• Strong evidence of a large (27%) increase in the odds of drinkers attending a sexual health clinic purchasing alcohol from on-licensed premises increased by (OR 1.27, 95% CI: +1.05

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	to +1.55; p=0.031) relative to England. This was driven by a reduction in the proportion purchasing alcohol from on-licensed premises in England across study waves. • There was no evidence from the sexual health clinic study that MUP affected probability of alcohol purchase from off-licensed premises, except for under-19s, for whom there was strong evidence that their odds of purchasing alcohol from off-licensed premises increased significantly in Scotland (after Bonferroni correction) relative to England (OR 2.12; CI: +1.37 to +3.28; p=0.001). • No statistically significant evidence that the probability of sexual health clinic attendees being current drinkers changed in Scotland relative to England post-MUP (OR 1.13; CI: +0.85 to +1.50; p=0.386). When disaggregating by age, sex, employment status and level of education, no subgroup saw a statistically significant difference (after Bonferroni correction). • No statistically significant evidence that the odds of binge drinking among current drinkers changed relative to England post-MUP (OR 1.13; 95% CI: +0.96 to +1.34; p=0.139). When disaggregating this analysis by age, sex, employment status and level of education, no subgroup saw a significant difference (after Bonferroni correction). • Among current drinkers attending a sexual health clinic, there was strong evidence of a large (22%) increase in the odds of 'alcohol misuse' (FAST score ≥ 3) relative to England post-MUP (OR 1.22; 95% CI: +1.04 to +1.42; p=0.012). This was driven by both an increase in the prevalence of alcohol use in Scotland and a decrease in England. When disaggregating by age, sex, employment status and level of education, no subgroup exhibited a significant difference after Bonferroni correction. • When disaggregating by age, there is strong evidence (after Bonferroni correction) of a small increase in the odds of sexual health clinic attendees under 19 years old in Scotland increasing their on-license alcohol purchasing, relative to England post-MUP (OR 2.13; 95%

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	CI: +1.33 to +3.41; p=0.002). No other subgroup saw a significant difference (after Bonferroni correction) between Scotland and England pre-post MUP. • A substantial set of professional stakeholders described observing no evidence that MUP affected purchasing or consumption of alcohol. Many characterised drinkers as resilient and resistant to change. Some youth workers felt that MUP had little effect on young people's consumption. Some professional stakeholders related observations that purchasing and consumption of alcohol may have reduced, such as a reduction in consumption of cheap white ciders. • Focus groups with young binge drinkers and older heavy, at-risk drinkers suggested that the vast majority reported no impact on drinking patterns or consumption. • MUP had no effect on other secondary outcomes in emergency department attendees (e.g. current drinker, binge drinking in past week/day, alcohol use, increased alcohol use in past year, drinking in private and drinking in licensed premises).
Xhurxhi (2020a)[42] Xhurxhi (2020b)[48] 	• For on- and off-sales combined, the early effects of MUP on purchasing were to decrease litres of alcohol sold per adult by 2.2%–15.0% and decrease litres of alcohol sold per adult drinker by 4.2%–14.8%. • For off-premise sales only, the early effects of MUP on purchasing were to decrease litres of alcohol sold per adult by 5.2%-18.4% and decrease litres of alcohol sold per adult drinker by between 4.9%–18.3%. • Relative to Wales, Scotland saw a significant reduction in likelihood of individuals reporting having drunk alcohol in the last seven days post-MUP (-0.0402, SE: 0.015). • Similar patterns were seen for other consumption-related outcomes (number of drinking days in last week, number of units drank on heaviest drinking day in past week, exceeding

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Author (quality rating)	Study findings pertaining to consumption (including sales and purchasing)
	recommended daily drinking limit on the heaviest drinking day in the last seven days) but these were not statistically significant. • Those drinking at harmful levels (>50 units for men, >35 units for women) reduced consumption according to each included metric of alcohol consumption post-MUP, relative to Wales. • Moderate drinkers (defined as <14 units per week) were found to be less likely to have consumed alcohol in the previous seven days in Scotland post-MUP, relative to Wales.

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Social and indirect outcomes

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to social and indirect outcomes
Anderson et al 2021[33] ✓✓	• Reductions in grams of alcohol purchased and increases in household expenditure on alcohol were predominantly limited to the households that purchased the most alcohol. • Households that generally bought small amounts of alcohol following MUP saw negligible increases in expenditure on alcohol, particularly lower-income households.
Dickie et al (2019)[32] ✓✓	• Interviews with licensing standards officers, Police Scotland licensing officers and trading standards officers indicated no evidence of increases in illegal alcohol-related activity as a result of the introduction of MUP.
Dimova et al (2022)[18] ✓✓	• Professional stakeholders had prior to MUP been concerned that service users would increase begging, robbing and stealing to acquire alcohol, but only reported increases in existing tendencies towards robbing and stealing in a minority of problem drinkers, and did not report changes in begging. • There was negligible discernible impact on services that work with homeless and street drinkers. • Despite initial concerns that vulnerable groups would prioritise alcohol over food and other necessities, this was not commonly reported by professional stakeholders post-MUP.

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Author (quality rating)	Study findings pertaining to social and indirect outcomes
	• Some professional stakeholders reported an increase in the use of food banks and drop-in centres that provide free lunches. It was challenging, however, to isolate this as an impact of MUP given the concurrent impacts of the COVID-19 pandemic. • Some service providers reported an increase in the use of illicit drugs (e.g. street Valium, benzos) and non-beverage alcohol because of MUP, mainly as a supplement to alcoholic drinks rather than a replacement. While some participants attributed this to MUP, others believed it was greatly influenced by the availability of low-priced street drugs.
Emslie et al (2023)[19]	• There was limited evidence that changes in the affordability of alcohol led to a possible increase in begging among some people with experience of homelessness. • Accounts of people with experience of homelessness contained no evidence that MUP caused substitution to non-beverage alcohol, and little evidence of MUP causing substitution to illicit drugs.
Ford et al (2020)[52]	• Few participants described specific instances where they felt MUP had directly impacted, positively or negatively, on children's experiences of harms. • Participants were cautious about saying whether alcohol-related harms to children and young people had or were occurring as direct results of MUP, or even the extent to which MUP had contributed. They felt that they did not yet have the evidence to judge, due to young people's reluctance to disclose sensitive information, a lack of awareness of the importance of the issue of alcohol during children's formative years or due to children's experience of harm having various contributing factors. • Participants reported observing increased drug use among families and young people, but could not say whether and how this was related to MUP. Participants could not identify a clear link between MUP and the use of other drugs, but some expressed

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Author (quality rating)	Study findings pertaining to social and indirect outcomes
	concerns that MUP could exacerbate existing problems for individuals facing poverty, welfare changes and what people can afford to buy, and their desire to use substances as a coping mechanism.
Francesconi and James (2022)[56]	• No evidence that MUP affected traffic fatalities of drunk-driving collisions in the first eight months of implementation. • The authors conclude that, while they found no evidence of any impact, this may be due to MUP predominantly affecting off-sales, while alcohol-related RTAs are likely predominantly related to on-sales.
Holmes et al (2022)[28]	• Pre-MUP implementation, compared to three to nine months post implementation, there was no statistically significant evidence (after adjustment for multiple testing) of differences in the proportion of service users in Scotland being in a low-income household (p=0.834), having benefits as the main source of income (p=0.024), being in the lowest IMD quintile (p=0.633), reporting struggling financially (p=0.672), having acute housing problems (p=0.318) or reporting using food banks or charities (p=0.113), relative to England. Similarly, when examining changes between pre-MUP implementation and 18–22 months post-implementation, there were no statistically significant differences in these outcomes for Scottish participants, relative to England. • Pre-MUP implementation, compared to three to nine months post implementation, there was no statistically significant difference (after adjustment for multiple testing) in the proportion of service users in Scotland reporting the use of prescribed substances (p=0.237), illicitly obtained prescribed substances (p=0.046), other illicit substances (p=0.214) or tobacco (p=0.792), relative to England. Similarly, when examining changes between pre-MUP implementation and 18–22 months post-implementation there were no

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Author (quality rating)	Study findings pertaining to social and indirect outcomes
	statistically significant differences in these outcomes for Scottish participants, relative to England. • Qualitative interviews described MUP as creating increased financial strain leading service users to reduce spending on non-alcohol essentials, borrow money, seek help from charities, not pay bills, use food banks, forego food or draw from savings or other sources of money. Many noted that MUP intensified existing pressures, particularly that owing to the introduction of Universal Credit which they were used to using coping strategies to try to mitigate. • There was limited qualitative evidence of increased drug use post-MUP. • Very few of those drinking at harmful levels reported stealing, and those that did typically did not link it to MUP. • Interviews with children and partners living with people who drink at harmful levels provided limited evidence of concerns about impacts on household budgets. • Some children and partners of people who drink at harmful levels expressed concerns about a potential increase in domestic violence due to MUP. • Analysis of survey data suggested that sharing a home with a partner or children had no impact on the consumption of people who drink at harmful levels.
Iconic Consulting (2020)[31] ✓ ✓	• Participants did not report any change in the nature or extent of alcohol-related health or social outcomes post-MUP.
Kopasker et al (2022)[54] Leckcivilize et al (2023)[55] ✓ ✓	Kopasker et al (2022)[54] • Food spending in Scotland was 1.0% (95% CI: −1.9% to 0.0%) lower compared to the north of England post-MUP, after adjusting for potentially relevant differences in households. There is some uncertainty around this finding due to the 95% confidence

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Author (quality rating)	Study findings pertaining to social and indirect outcomes
	interval slightly overlapping zero. The observed change represents a mean change of approximately 86p per household per week. • Statistically significant evidence that the volume of food purchased in Scotland changed relative to England (0.8%; 95% CI: -1.7% to -0.2%. p<0.1). • Strong evidence of small reductions in spending for dairy (-1.4%, 95% CI: -2.7 to -0.2), cereal (-3.5%, 95% CI: -6.0 to -1.0) and fruit and vegetables (-2.5%, 95% CI: -4.3 to -0.8) in Scotland, relative to northern England. Strong evidence of a 2.5% increase in spending were observed for crisps and snacks relative to northern England (95% CI: 0.2 to 4.9). No significant changes were observed for amount spent on canned food, convenience food, rice and pasta, fish, meat, tea and coffee, juice, home cooking, biscuits and bakery, soft drinks, confectionary or slimming products. • Changes in spending on food were relatively small; the largest statistically significant change observed was a mean reduction of 16p per household per week. • At the end of this first paper the researchers conclude that MUP may be detrimental to healthy diets, based on the finding that there was a small reduction in household expenditure on food and decreases in volume of fruit and veg and increase in volume of crisps and snacks. However, the changes observed are relatively small, and include some positive changes, such as a reduction in sugar consumption. They then did further analysis on actual dietary quality, rather than simply food expenditure and volume. Leckcivilize et al (2023)[55] • MUP was associated with a significant reduction in sugar purchases from all sources excluding alcohol (1.6%) and from alcohol (16.6%).

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Author (quality rating)	Study findings pertaining to social and indirect outcomes
	• Other than sugar, there were no significant effects observed for other nutrients, energy density or dietary quality. • MUP was associated with greater reductions in sugar purchases from alcohol in the six most deprived deciles compared to the four least deprived deciles, however these were non-significant (p>0.05), and greater reductions were observed in households with higher levels of alcohol purchasing (>14 units per adult per week) than those with moderate alcohol purchasing. • In conclusion, the researchers suggest that the introduction of MUP had little significant effect on nutrition from food purchased to eat at home, except for a beneficial effect on sugar consumption. The potential for further impact should, however, continue to be considered as part of any future review of changes to MUP policy.
Krzemieniewska-Nandwani et al (2021)[53] 	• In the period following the introduction of MUP there were no statistically significant changes in the rate of all crime, alcohol-related crime, non-alcohol-related crime, public-nuisance incidents or drug-related crimes. No significant changes were seen in rates of specific alcohol-related crimes, with the exception of neighbour disputes, for which there was a strong evidence of a large reduction 13 weeks post-MUP (-20.5%, 95% CI: -30.4 to -9.1, p=0.01). • East Ayrshire was the only Scottish local authority that saw a statistically significant change (increase) on alcohol-related crime post-MUP (15.0%; 95% CI: +0.2 to +31.8, p=0.05). • A statistically significant 63.3% increase (95% CI: +2.2% to +160.9%, p=0.04) in the consumption of alcohol in designated place was found in Glasgow City, and a statistically significant 86.38% increase (95% CI: +0.6% to +245.2%, p=0.05) in threatening or abusive behaviour was found in Moray, however the particularly wide confidence

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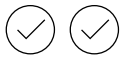
Author (quality rating)	Study findings pertaining to social and indirect outcomes
	intervals for this estimate indicate that this is likely an increase in what was originally a small number of instances. • No changes in the age and sex distribution of alcohol-related crime perpetration or victimisation were seen post-MUP. • In the most deprived decile in Scotland, there was no statistically significant evidence of a change in the overall level of alcohol-related crimes (1.0%; 95% CI: -5.9 to +8.6, p=0.78). However, a significant 20.5% increase (95% CI: -0.1% to +45.2%) was seen in antisocial behaviour; a significant 71.7% increase (95% CI: +23.5% to +138.9%) was seen in threatening or abusive behaviour; and a significant 34.0% decrease (95% CI: -52.5% to -8.3%) was seen in the consumption of alcohol in designated places. • There was no discernible difference in all alcohol-related crime and disorder trends in Greater Glasgow in comparison to Greater Manchester. • Collectively, these analyses were interpreted as evidence that MUP has had a minimal impact on the trend, direction or level of alcohol-related crime, disorder and public nuisance.
Manca et al (2022b)[57] 	• Strong evidence of a 7.2% post-MUP increase in the total number of road traffic accidents in Scotland (95% CI: +0.9 to +13.7, p=0.03), albeit with a relatively wide confidence interval. This contrasts with an observed non-significant 0.9% increase in England & Wales (95% CI: +2.3 to +3.2, p=0.75). • There was no evidence of differential impact by level of socioeconomic deprivation. • The authors argue that it is implausible that such a large differential between Scotland and England & Wales was caused by MUP, given the concurrent decrease in alcohol

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Author (quality rating)	Study findings pertaining to social and indirect outcomes
	sales, and they suggest that the observed differential was likely a result of an unmeasured confounder such as weather, road quality or demographic changes.
McCann et al (2020)[15] Kwasnicka et al. (2020)[14] (No quality appraisal score allocated – see **Technical Appendix** for details)	• One participant recounted borrowing money to continue drinking.
O'Donnell et al (2019)[35]	• Across all Scottish households, MUP was associated with a non-significant relative increase in weekly expenditure on alcohol of 61p (95% CI: -5 to +127) per adult, per household. • Changes in weekly expenditure not systematically associated with household income but increased with amount of alcohol purchased.
Stead et al (2020)[36] Stead et al (2022)[38]	• There were a small number of trade press reports of hostile customer reactions, but also some reports of improvements in antisocial behaviour around small retail premises. One report of shoplifting confectionery was specifically characterised as being potentially associated with MUP. • Some trade press reports anticipated (pre-MUP) that customers would shift spending from other household budgets to maintain alcohol purchasing, but there were no examples given of this in trade press content post-MUP. Similarly, pre-MUP predictions of shifts towards illicit purchasing were not reflected in post-MUP reporting.
So et al (2021)[27]	• Professional stakeholders predominantly reported that they had not observed any impacts of MUP on crime and social issues, though one primary care stakeholder felt that their patients were accessing food banks more, and some were committing crimes.

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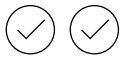
Author (quality rating)	Study findings pertaining to social and indirect outcomes
	• No statistically significant evidence among sexual health clinic attendees of an increase in Scotland (relative to England) of consumption of illicit drugs post-MUP (OR 1.04; 95% CI: +0.88 to +1.24; p=0.612). When disaggregating by age, sex, employment status and level of education, no subgroup exhibited a significant difference. • Some professional stakeholders expressed concerns that MUP would drive use of alternative sources of alcohol and alternative substances, but post-MUP no stakeholders reported observing those outcomes. • Despite some concerns pre-MUP that poor or disadvantaged people with alcohol dependence drinkers may turn to petty crime or limit their spending on food to maintain alcohol acquisition, post-MUP focus groups provided little evidence of any adverse consequences of this type, and participants with more direct experience of addiction did not always support that view.
Vandoros and Kawachi (2022)[58] 	• Controlling for seasonality, there was strong evidence of a small relative decrease in collisions in Scotland compared with England & Wales (difference-in-difference interaction coefficient, −0.35; 95% CI: −0.65 to −0.04; p=0.03), albeit with a relatively wide confident interval. The relative decrease in Scotland was between 1.52 and 1.90 daily collisions on average in the initial months of MUP. • The authors conclude that MUP reduced harmful RTAs.

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Alcoholic drinks industry

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
Ferguson et al (2022)[40] ✓	• Natural volume sales per adult declined 2.4%. Products that saw larger price increases (e.g. ciders, perries and supermarket own-brand spirits) tended to see larger reductions in sales. The cider category reduced 17.5% in natural volume sales per adult overall; some strong ciders saw reductions of over 90% in convenience stores. The perry category reduced by 40.0% overall. There were also large reductions in natural volume sales for supermarket own-brand blended whisky (-31.6%), gin (-22.7%), and vodka (-40.1%). • Natural volumes of alcoholic drinks sold in larger container sizes or larger multipacks declined, especially for products that saw larger price increases, such as ≥1l bottles of cider and spirits, and large multipacks of beer. This was partially offset by sales in smaller containers. • Reduced sales in multipacks with 13 or greater items for beer (-34.3%, and a drop in share from 29.2% to 19.0%) and cider (-68.4%, and a drop in share from 12.9% to 4.9%). Increased sales in multipacks with 12 or fewer items for beer (+17.3%) and cider (+14%). The proportion of beer sold in multipacks was largely stable. The proportion of cider sold in multipacks increased, largely due to the steep decline in single packs over 1,000ml. • Within the top 73 brands in convenience stores and supermarkets, more product variants were introduced in 2017–18 than in the first year of MUP (52 introduced in 2017–18, compared to 33).

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	• Two brands (Lambrini and own-brand Soave wine) saw products introduced that emerged as representing a substantial proportion of sales post-MUP implementation (around one-third and one half of these brands' total sales, respectively). • Within the top 50 brands in convenience stores and supermarkets more products were discontinued between 2016–17 and 2017–18 than between 2017–18 and the first year of MUP (32 versus 27). • Between February 2018 and February 2019, ABV decreased for 2.9% of all products and increased for 1.5%. Three-quarters (74.5%) of products that changed in ABV were wines, whereas less than 2% of wines and spirits changed their ABV content). • These findings were taken to indicate limited evidence that MUP has had an effect on the introduction or discontinuation of products, or on the alcohol by volume content of products.
Frontier Economics (2019)[37] 	• Some producers and retailers reported changing their strategies and product lines in response to MUP, including de-listing and reformulating small number of product lines, and introducing new formats and packaging sizes. These changes were limited due to the Scottish market being a small portion of many firms' overall turnover. • MUP was understood to have accelerated the UK-wide trend towards premiumisation (consumer demand for higher-value products). • MUP led to switching from larger to smaller product sizes, limited by brand loyalty and occasion-based purchases. • MUP had a negative overall impact on sales of alcoholic drinks, particularly in products that previously retailed well below £0.50 per unit. • MUP appeared to lead to higher average wholesale margins for some producers due to MUP preventing some price promotions.

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	• Little evidence of diversion of purchasing from larger to smaller retailers, and no overall reduction in off-trade foot traffic. • Little evidence that retailers passed any increased revenue on to customers by discounting non-alcohol products. • The overall effect on retailer revenue was estimated to be small owing to increased margins compensating for reductions in volume. • The overall effect on producer revenue was estimated to be small but negative, owing to a reduction in the volume of alcoholic drinks produced in Scotland. • Some evidence of Scottish consumers increasing cross-border purchasing, primarily within 15km of the border and close to major English towns, but no evidence of a substantial impact on profitability, turnover or employment of retailers in Scotland close to the border. • Other regulatory and economic factors were reported to be stronger drivers of cross-border purchasing behaviour. • Volumes of alcoholic drinks decreased slightly for Scottish retailers close to the border. This small decrease was evenly distributed across a large number of smaller retailers. There is insufficient evidence to conclude that this effect was not present in retailers elsewhere in Scotland. • Indirect evidence of increased cross-border purchasing being driven by MUP generally involves individual shoppers, not people bulk-purchasing with the intent of distributing to others.
Frontier Economics (2023)[39] 	• Descriptive analysis of data available from ONS (in conjunction with discussion with academic experts and representatives of the Scottish Retail Consortium) indicates no material impact of MUP on: the specialised retail sector; the non-specialised retail sector; the on-trade retail sector; the

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	wholesale sector (including specialised alcohol wholesale); the spirits production sector; the beer production sector; or the malt production sector. • Key metrics on the number of enterprises and business units, employment, turnover, GVA and output value in these sectors in Scotland tend to either show consistent trends pre- and post-MUP, show similar trends to England & Wales, or are subject to substantial volatility which prevents firm conclusions being drawn about any impact of MUP (particularly for GVA and output value, possibly owing to the COVID-19 pandemic). • Interviewees from the alcohol retail and production sector reflected that trends in consumer responses to MUP occurred reasonably quickly and in general viewed that these would have been established before the COVID-19 pandemic. • Mixed views were reported in terms of any impact MUP might have had on the alcohol industry's revenue and profits, with it difficult to distinguish between any impacts due to MUP or COVID-19. No respondent reported any changes in employment or facilities owing to MUP. • Producers largely reflected that their revenues have remained constant (notwithstanding the effects of COVID-19 on the on-trade), but that profit margins have been reduced owing to increases in staff and material costs. Large retailers did not report observing any change in revenue or profits due to MUP, but convenience stores were more likely to have noted a decrease in revenue and profits. • Most specialist retailers did not report observing a change in revenue or profits due to MUP, but one did report a £50,000 decrease in annual revenue which they attributed to MUP. • Interviewees reported that in Scotland volume sales of alcohol had decreased, while value had increased. Retailers and producers welcomed these impacts as being consistent with their marketing and growth strategies.

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	• A significant concern for some alcohol producers in Scotland is that large retailers are not passing on any profits created by MUP, in part by squeezing producers on costs to retain high profit margins on premium products. • Scottish retailers and producers did not report any changes in the on-trade market share following MUP. • Some retailers interviewed noted that consumers have transitioned to purchasing lower volumes of alcohol at higher alcohol content. • Interviewees noted that 'own-label' brands closer to the MUP price point have tended to suffer because of the trends towards lower volume and higher cost. • Interviewees reported few changes in the production and stocking of specific products, where the small amount that had been de-listed were ciders sold in 2–3 litre volumes. • Where product reformulation had taken place to lower ABV, interviewees indicated that this was due to the public's health trends and for consistency between the Scottish and wider UK market. • The most commonly reported area of change to product ranges was for pack sizes and formats, including reduced volumes to adhere to certain price points. • Interviewees noted the constraints that MUP places on promotions and one large retailer has responded to this by attempting to be more creative and imaginative with how the market products. • Smaller retailers had typically not changed their marketing approach and that MUP had created particular challenges where they are looking to sell leftover stock quickly. • Interviewees were largely not aware of cross-border purchasing being made.

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	• Overall, these findings were taken as evidence that MUP has not significantly impacted the performance of the Scottish alcoholic drinks industry, and that the industry has largely moved on from the introduction of MUP.
Giles et al (2022)[47] ✓ ✓	• A 3% reduction in total alcohol sales was driven primarily by a 3.6% reduction in off-trade sales (95% CI: -4.8% to -2.5%), while on-trade sales did not change significantly. • Analysing by category of alcoholic drink, there was strong evidence of reductions in the volume of alcohol sold in perry (31.6%; 95% CI: -38.5% to -23.9%, p<0.001), cider (13.5%; 95% CI: -17.0% -9.8%, p<0.001) and spirits (5.1%; 95% CI: -6.6% to -3.6%, p<0.001). • There were no significant net changes in the volume of alcohol sold in wine or RTDs. • There was strong evidence of a large net increase in the volume of alcohol sold in fortified wine (13.4%, 95% CI: 7.4% to 19.7%, p<0.001).
Griffith et al (2022)[34] ✓	• 5% of Scottish households living closest to the Scotland–England border did not see a statistically significant post-MUP change in the number of alcohol units purchased per adult per week, conversely to households living further from the border which did see significant reductions, relative to England. • This was taken as evidence of some cross-border shopping, albeit likely with a negligible impact on population-level purchasing, owing to low population density close to the border.
Llopis et al (2021)[44] ✓ ✓	• Post-MUP in Scotland Kantar Worldpanel data indicate there was: ○ a reduction in the proportion of purchases of higher-strength beers (>3.5% ABV) that were on price promotion (-0.114, 95% CI: -0.117 to -0.111)

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	○ a small reduction in the proportion of purchases of low-strength beers (between 0% and 3.5% ABV) that were on price promotion (-0.065, 95% CI: -0.068 to -0.063) ○ a small increase in the proportion of alcohol-free beers that were on price promotion (0.030, 95% CI: 0.024 to 0.036) ○ a reduction in the proportion of higher-strength ciders purchased on price promotion (-0.033, -95% CI: 0.036 to -0.030) ○ no change in the proportion of lower-strength ciders purchased on price promotion (-0.006, -95% CI: 0.022 to 0.010) ○ a reduction in the proportion of alcohol-free ciders purchased on price promotion (-0.043, -95% CI: 0.054 to -0.032). • This was interpreted as evidence that pricing policies such as MUP can facilitate shifts to lower-strength alcohol products.
O'Donnell et al (2019)[35] ✓ ✓	• In the short term, the largest reductions in off-trade purchasing were in beer, spirits and cider. • The authors conclude that in the short term MUP effectively targeted consumption of own-brand spirits and high-strength white ciders, making the cheapest and strongest alcoholic drinks products less affordable.
Patterson et al (2022)[51] ✓	• Turnover of off-trade licenses was similar each side of the border in 2019. Northern England saw 3.9% of the previous year's number of licensed premises close, compared to 2.3% in southern Scotland. Both areas saw a similar proportion of new licenses established in 2019, equivalent to 2.7% of 2018's number. A much larger proportion of off-trade licences were terminated in northern England in 2020, equivalent to 18.9% of the number in 2019, compared to only 3.0% in southern

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	Scotland. There was no evidence of either systematic closures along the Scottish side of the border or openings along the English side.
Robinson et al (2021)[46] ✓ ✓	• The greatest relative net reductions in per-adult off-trade sales were in cider and perry, followed by spirits and beer. • There were increases in off-trade sales of fortified wine and RTDs. • The authors conclude that the categories that saw the greatest reductions in sales were those with the greatest share of the off-trade market, and therefore made a large contribution to an overall decrease in alcohol purchasing.
So et al (2021)[27] ✓ ✓	• A small number of professional stakeholders perceived MUP as having been economically beneficial to smaller independent retailers. • There was no qualitative evidence of cross-border purchasing. A police stakeholder interviewed post-MUP expressed surprise that they had not been aware of any increase in cross-border purchasing post-MUP. • A small number of licensing stakeholders described individual examples of retailers experiencing problems (e.g. a branch of a chain based in England put under pressure by having to comply with MUP when selling stock from suppliers in England; unprepared shopkeepers suffering economically because of being left with stock they were unable to sell at or above £0.50 per unit).
Stead et al (2020)[36] Stead et al (2022)[38] ✓ ✓	• An audit of small retailers found a 3.3% reduction in the total number of alcoholic products observed. The reduction was greater in multipacks (-9.3%) than individual containers (-2.2%). In terms of product category, the greatest changes were in perries (-31.1%) and ciders (-19.9%), but reductions

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	were observed for most categories. The biggest increase observed was for non-multipack RTDs (13.6%). • The category that saw the largest decrease in the average number of products sold at least once by each small retailer was cider non-multipacks, which reduced by 40.6% between August 2017 and January 2019, mostly coinciding with MUP implementation. • There were increases in the number of non-multipack RTD (+11.7%) and non-multipack beer (+12.7%) products sold at least once by each small retailer between August 2017 and January 2019, but it is unclear to what extent this was driven by MUP. Between October 2017 and October 2018, a 9.3% reduction in the display of multipack alcoholic products was seen, compared to a 2.2% reduction in the display of single products. • Year-on-year decreases were observed post-MUP in the weighted average volume for non-multipack cider (-15.1%, from 1,178ml to 1,010ml) and perry (-8.3%, from 1,198ml to 1,099ml), coinciding with MUP implementation, which was at least partially explained by manufacturer changes in the variants produced. • Year-on-year decreases were observed post-MUP in the weighted average ABV for cider non-multipacks (-17.2% from 6.4% to 5.3% ABV), perry (-15.9%, from 6.9% to 5.8% ABV) and beer non-multipacks (-12.9% from 6.2% to 5.4% ABV). The timing of these changes coincided with MUP implementation. • Quantitative evidence relating to the volume and strength of alcoholic products was interpreted as being likely driven by consumer purchasing trends, rather than MUP. • In interviews, small retailers reported minimal changes to the product lines they stocked, with the most common change being de-listing a small number of high-strength, low-cost products. A small number of retailers reported increasing prices on unaffected products. These findings were

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Author (quality rating)	Study findings pertaining to the alcoholic drinks industry
	somewhat contradicted by trade press reports that many retailers had changed the lines they stocked, de-listing larger containers and removing certain brands of spirits and beer altogether. • Some small retailers experienced being left with stock that they found they could not sell at compliant prices. • Some trade press reports stated that MUP had benefited sales of premium products due to reduction of price differentials. • Trade press reported that the practice of price-marking stock was less common post-MUP. • There were trade reports that two producers launched new 500ml bottles of spirits, in line with findings that customers were switching from cider to other categories, including spirits. • Trade press pre-MUP predictions of shifts towards online and cross-border purchasing were not reflected in retailers' post-MUP reports. Online purchasing was reported as being minor. • Post-MUP multiple trade press articles reported on positive impacts of MUP on small retailers' competitiveness with supermarkets, profit margins and value of overall alcohol sales. • Small retailers reported varied perceptions of changes to customers' purchasing post-MUP; some felt that there had been little change, some felt that their sales had increased, and some reported that sales of certain products (particularly high-strength cider) had fallen sharply. This was reinforced by the findings of the analysis of trade press, which also reported that MUP had driven switching from cider to wine or smaller bottles of spirits.
Xhurxhi (2020a)[42] Xhurxhi (2020b)[48] 	• For off-trade sales, MUP coincided with an increase in the average price per unit of alcohol in Scotland of 6.9% (range from 3.5% to 21%), again with cider seeing the steepest increase (21.0%). • MUP was not associated with any significant change in on-trade sales price per unit.

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Attitudes to MUP

One tick denotes a ‘Moderate’ score, while two ticks denote a ‘Strong’ score.

Author (quality rating)	Study findings pertaining to attitudes to MUP
Dimova et al (2022)[18] ✓✓	• Most professional stakeholders understood the rationale behind MUP and supported its intentions as a public health policy. • The reported level of preparation for MUP varied, but many service providers felt that they had been insufficiently informed about the implementation of MUP and were therefore less equipped to support service users. • There was a view from some service providers that a further increase in MUP would be beneficial in a greater reduction of alcohol consumption, if complemented by additional support for people that wish to reduce their consumption. Several participants warned against increasing the minimum price in the absence of improved alcohol treatment services. • Several service providers believed service users would prioritise the purchase of alcohol over necessities such as food, exacerbating poverty and poor health.
Emslie et al (2023)[19] ✓✓	• People with experience of homelessness were typically aware of the introduction of MUP, and particularly price changes in strong white ciders, but typically considered it low priority in comparison with other challenges. Some were hopeful that MUP could reduce harms, while others were concerned about effects on poorer people, particularly alcohol-dependent people.

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Author (quality rating)	Study findings pertaining to attitudes to MUP
Ferguson et al (2020)[59] ✓	• Attitudes towards MUP were more favourable post-MUP (49.8% in 2019) than pre-MUP (41.3% in 2015). However, given the age of the pre-MUP data, this cannot be taken as evidence that the change in attitudes occurred place after implementation of MUP. • Among those in favour of MUP, the most frequent rationales for supporting MUP were to help tackle problems caused by alcohol in general (31.9% of favourable respondents in 2019); to help stop people drinking too much in general (22.1%); to help stop young people drinking (or drinking too much) (16.6%); and to help tackle health problems from drinking (12.0%). • Support for MUP was greater than opposition to MUP in each subgroup (deprivation quintile, sex, age). Deprivation appeared to be negatively correlated with support for MUP (44% of most deprived quintile were in support vs 60% of the least deprived). • There was no relationship between sex and attitudes towards MUP. • Older individuals were more likely to support MUP (44.4% of 18–24-year-olds versus over 50.9% in all age groups over 35). • Reasons for an unfavourable attitude to MUP were more varied although the majority and included scepticism that it would work, especially for those with alcohol dependence.
Ford et al (2020)[52] ✓ ✓	• Participants found any perceived reductions in young people's consumption to be challenging to attribute to MUP alone, decoupled from other factors. • A number of participants noted the high profile of the issue of MUP in the media, including social media. One hoped that the level of public debate might generate positive outcomes by nudging the general population to reflect on alcohol consumption and health. • Awareness of MUP was felt to be higher among young people relative to other age groups.

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Author (quality rating)	Study findings pertaining to attitudes to MUP
	• Participants noted that price increases helped some parents/carers to reflect on what they are drinking and purchasing. • Participants described discussions they had had with young people who were working through the implications of MUP for their own alcohol purchasing patterns and consumption. • Participants suggested that, among those people variously described as 'non-dependent' drinkers, 'binge drinkers' and those able to stick to a previously set budget for alcohol, the increase in price could possibly lead people to examine and change their consumption. Conversely, they perceived those with a dependence on alcohol to be less likely to make the connection between the price of alcohol, their level of consumption and increasing financial strain. • Practitioners perceived MUP as valuable as a whole-population approach, and how it could have a preventative role in preventing young people from drinking alcohol habitually, although this was tempered by a view that young people would still be able to obtain alcohol. • Service users whom participants referred to as 'hazardous and harmful drinkers' were described as being unaware of MUP until they went to purchase alcohol, becoming angry at the cost. • Some participants perceived MUP as a 'blunt instrument', potentially placing strain on household finances without addressing underlying causes of harmful drinking. • For people described by participants as 'dependent', 'addicted', 'in addiction' or with a 'strong addiction' the view was that increasing the price of alcohol was unlikely to affect their consumption, with implications for household income and the potential impact on the family.

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Author (quality rating)	Study findings pertaining to attitudes to MUP
Frontier Economics (2023)[39] ✓ ✓	• Case studies with retailers and producers of alcoholic drinks, conducted after implementation, found that participants had come to consider MUP as business as usual, but were concerned that increasing the minimum price would cause disruption, and about the potential for new policies such as Scotland's Deposit Return Scheme to interact with MUP.
Holmes et al (2022)[28] ✓ ✓	• Those with alcohol dependence or drinking at harmful levels showed limited awareness of MUP, and that it was not a priority or concern for many participants, and some suggested people do not notice alcohol prices. • Some participants were positive about, and hopeful for, MUP, but some believed that MUP would not, and was not, working for people drinking harmfully or dependent on alcohol. • Changing price and availability of cheap ciders prompted reflection about drinking behaviours among some participants.
Leon et al (2021)[60] ✓	• Pronounced peaks in searches for queries related to 'minimum unit pricing' were observed around the time of the introduction of the intervention; these were more pronounced in Scotland than England. • Peaks were observed in Scotland (and to a much lesser extent in England) of queries containing specific terms about cheap alcoholic drinks, perhaps indicating that Bing search engine users were searching for sources of cheap alcoholic drinks in light of MUP. • There was no evidence of any change in the relative frequency of search topics related to alcohol problems and intoxication. • Very few queries about cross-border alcohol were observed in Bing searches, and no significant peak was observed around MUP introduction.

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Author (quality rating)	Study findings pertaining to attitudes to MUP
	• Peak in Scotland (relative to England) of queries related to online alcohol, which may indicate that interest in online cross-border purchasing grew in Scotland post-MUP.
So et al (2021)[27] ✓ ✓	• Most focus group participants were aware of MUP, its aims and its mechanism owing to word of mouth, news reports and social media. They typically found it challenging to understand how the prices of specific products and product categories would be affected. There was some conflation of ABV with number of units, some confusion with prior restrictions on bulk discounting of alcohol, and many misunderstood MUP as a form of alcohol tax that would benefit public funds. • In pre-MUP interviews, professional stakeholders typically expected that MUP would reduce purchasing and consumption of alcohol and produce long-term improvements in population health. Some also anticipated social benefits related to crime, antisocial behaviour and domestic issues. • Many focus group participants often expressed doubts about MUP's potential to reduce alcohol dependence, and expressed concerns about adverse consequences for people with alcohol dependence issues in deprived circumstances. • A minority of participants discussed different potential economic impacts of MUP; one addiction services stakeholder reported concern that larger retailers rather than the government potentially stand to profit from MUP. • Focus group participants' narratives suggest that much of the media coverage of MUP focused on cheap, high-strength ciders, though some mentioned hearing that MUP may affect cheap wines, large beer multipacks and cheap spirits. Some felt that MUP would affect alcopops and Buckfast tonic wine, but these were mentioned less frequently and with less certainty.

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Author (quality rating)	Study findings pertaining to attitudes to MUP
	• Some focus group evidence of MUP having a broader impact on people's attitudes towards alcohol (e.g. reinforcing a belief that alcohol harm in general predominantly affects a marginalised minority of so-called problem drinkers or street drinkers).
Stead et al (2020)[36] Stead et al (2022)[38] ✓ ✓	• In pre-MUP interviews small retailers exhibited varying levels of awareness and understanding of MUP; some did not understand that the policy was linked to product strength, some showed poor understanding of how MUP would work, but others felt that discussion of MUP had helped raise awareness of the concept of units and the unit content of different products. • Several trade press articles reported suggestions that MUP was an excessive 'nanny state' government intervention that was speculated could lead to further such interventions, or outright prohibition in the future. There was also reporting that MUP was based on insufficient, or flawed evidence. There were both positive and negative predictions made about the impact of MUP on small retailers and consumers; Scottish publications were substantially more positive than UK-wide publications.

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Appendix D: Data collection timelines

Figures D1 and D2 illustrate the time periods during which the data used in each paper were collected. Figure D1 illustrates the data collection periods for qualitative data used in qualitative papers and mixed-methods papers. Figure D2 illustrates the data collection periods for quantitative data used in quantitative papers and mixed-methods papers. One study, by Xhurxhi,[42,48] uses annual data and pragmatically considers the whole of 2018 to be post-MUP data; every other study used data that allowed for a clear division between pre- and post-MUP time periods.

Figure D1: Time periods of data collection for qualitative studies

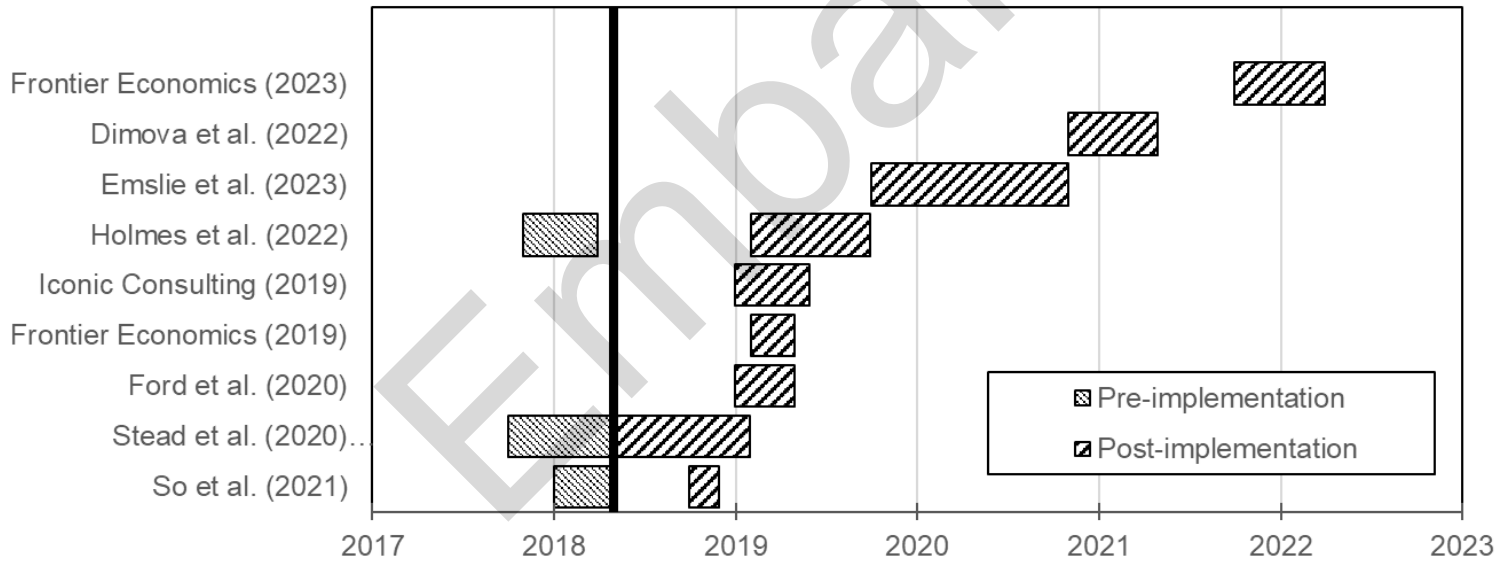

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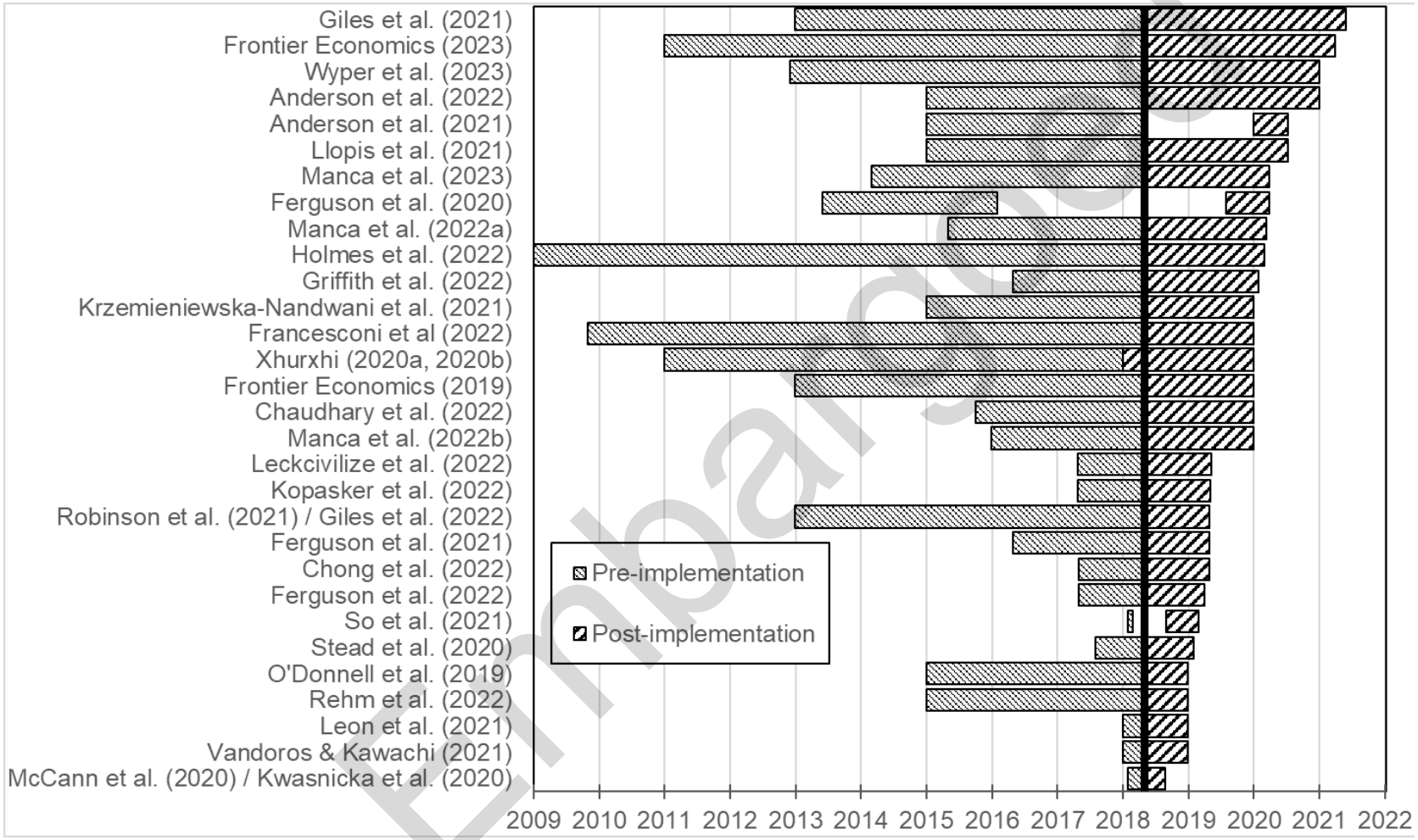
Figure D2: Time periods of data collection for quantitative studies



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Appendix E: Literature excluded due to being rated as 'weak' quality

Five pieces of literature that were initially selected for relevance during the screening process were later excluded from the evidence synthesis due to being assigned a 'weak' rating following the quality appraisal process. In the interests of transparency, this appendix lists each excluded paper, specifies the criteria that led to its exclusion, and outlines its key findings.

It is important to note that applying a quality appraisal tool to a piece of research literature is inherently restricted to appraising the reporting of the research, rather than rating the research itself, and in some cases the reporting of research was necessarily limited due to the constraints of specific publishing formats.

Citation and description	Quality criteria for which a 'weak' rating was assigned	Summary of relevant findings
Alcohol Health Alliance UK, 2020[97] Report conducted and published by Alcohol Health Alliance UK, reporting on an audit of retailers across Scotland, England and Wales to compare how cheaply alcohol is sold in the different nations.	Appraisal tool used: modified EPHPP Selection bias: unable to discern the representativeness of the sample. Design: cross-sectional survey Confounders: cannot tell whether there were important differences between the two groups being compared.	Due to retailer compliance with a £0.50 per unit minimum price in Scotland and Wales, the cheapest alcoholic drinks products in England are substantially cheaper than in Scotland and/or Wales, particularly for cider, beer and perry, but also wine and vodka.

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Citation and description	Quality criteria for which a 'weak' rating was assigned	Summary of relevant findings
	Data collection methods: methods and tools are neither described nor justified adequately	
Astill Wright et al, 2019[98] Peer-reviewed research paper published in BMJ Open, reporting analysis of Twitter posts related to MUP following the introduction of the intervention. The research is described as qualitative due to the nature of the raw data. However, we decided that this research was best appraised using our modified EPHPP tool as the analysis and results are quantitative in nature.	Appraisal tool used: modified EPHPP Selection bias: the sample was appraised as not being likely to be representative of the target population. Design: used a non-controlled design (more specifically, the Twitter metadata used to divide users into Scottish and non-Scottish groups was not presented as being sufficiently robust, with no way to know if there are important systematic differences between those groups).	Twitter posts related to MUP (n=53,574) were slightly more positive (35%) than negative (28%) about MUP; more so within posts originating in Scotland. Positive posts frequently identified the potential of MUP to reduce health harms, while negative posts frequently identified potential negative effects on 'problem drinkers'. 55% of relevant posts originated with alcohol-policy-related individuals or organisations, rather than lay public.
Critchlow et al, 2022[99] Single-page summary of an academic analysis of quantitative survey data. The overall weak rating is likely due to	Appraisal tool used: modified EPHPP Design: used a non-controlled design	52% of 11–19-year-olds in Scotland (n=418) were aware of MUP. Awareness of MUP was higher among older respondents and among current drinkers.

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Citation and description	Quality criteria for which a 'weak' rating was assigned	Summary of relevant findings
the limited space for methodological detail available in the briefing format in which these research findings are presented.	Data collection methods: Methods and tools are neither described nor justified adequately.	Of those who were aware of MUP, 34% correctly reported the £0.50 per unit price threshold. The others either underestimated the threshold (5%), overestimated it (25%) or did not know.
Duffy et al, 2022[92] Discussion paper published by the Institute of Economic Affairs, reporting a controlled, longitudinal quantitative analysis of alcoholic drink sales data in Scotland, England and Wales. The researchers sought to measure the financial cost of MUP to consumers in Scotland, and compare those costs against potential benefits.	Appraisal tool used: modified EPHPP Confounders: Cannot tell whether there were important differences between the two groups being compared. Data collection methods: Methods and tools are neither described nor justified adequately.	In 2019, off-trade alcoholic drinks sales were 4% lower in Scotland than they would have been without MUP. The additional sales represented an additional cost to consumers of £93.6m. Extrapolated over four years, it is estimated that MUP represented an additional cost to consumers in Scotland of £270m (or £59.39 per adult, or £71.12 per drinker).
Elliott et al, 2022[17] CSO research project briefing reporting a qualitative study designed to capture experiences of MUP among homeless	Appraisal tool used: CASP qualitative checklist Cannot discern whether: • the recruitment strategy was appropriate to the research aims	Homeless and street drinker participants generally aware of MUP, but considered it relatively low priority as a daily concern. Impacts on consumption varied: some reduced drinking, some unaffected, some

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Citation and description	Quality criteria for which a 'weak' rating was assigned	Summary of relevant findings
drinkers, street drinkers and support service providers that work with them. The overall weak rating is likely due to the limited space for methodological detail available in the briefing format in which these research findings are presented. However, the research reported in this briefing has since been published in two papers: one peer-reviewed journal article and one pre-print paper. Each of these papers was rated 'strong' and included in the evidence synthesis.	• the data collection addressed the research issue • the relationship between researcher and participants has been considered adequately • ethical issues have been taken into consideration • the data analysis was sufficiently rigorous.	switched the categories of alcoholic drinks they used and some increased their (existing) drug use. MUP exacerbated an existing tendency for a minority of 'problem drinkers' to beg or commit crime to obtain alcohol, or to displace spending on other necessities such as food.

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