

MUP Evaluation Evidence Synthesis Protocol

Evidence synthesis protocol

November 2022

Clare Beeston, Chris Patterson, Stefania Greci, Fiona Myers,
Karl Ferguson, Neil Chalmers, Neil Craig



Translations



Easy read



BSL



Audio




Large print



Braille

Translations and other formats are available on request at:

 p hs.otherformats@p hs.scot

 0131 314 5300

Public Health Scotland is Scotland's national agency for improving and protecting the health and wellbeing of Scotland's people.

© Public Health Scotland 2022

0917 11/2022

OGL

This publication is licensed for re-use under the [Open Government Licence v3.0](#).

For more information, visit

www.publichealthscotland.scot/ogl



www.publichealthscotland.scot

Contents

Abstract	3
Support	3
Background	4
Methods	7
Cost consequence analysis	17
Appendix A: Initial hypothesis map	18
Appendix B: If/then statements	19
References	26

Abstract

Minimum Unit Pricing (MUP) in Scotland came into effect in May 2018. The measure imposed a minimum price of 50 pence per unit of alcohol sold. Due to a sunset clause in the legislation, MUP will cease to be in effect in 2024 unless the Scottish Parliament votes to approve its continuation. To help inform this decision, Public Health Scotland is conducting a comprehensive, independent evaluation of the evidence of the effects of MUP. The evaluation seeks to answer two questions:

1. Has minimum unit pricing contributed to reducing the health harms related to alcohol?
2. Are some people and businesses more affected (positively or negatively) than others?

The design of the evidence synthesis is informed by the recognition that MUP is an intervention with a complex range of potential effects, and a complex range of factors that may moderate those effects. We have designed a theory-based evidence synthesis that draws on elements of realist synthesis and process tracing. This design will allow us to get the best value from the diversity of the evidence that is available, both investigating whether MUP led to reduction in alcohol-related health harms, and understanding how changes occurred, and for who. This protocol sets out the context of the evaluation, justifies the methods we have chosen to synthesise the evidence, and sets out the steps involved in conducting the synthesis.

Support

Public Health Scotland (PHS) is jointly sponsored by COSLA and the Scottish Government and collaborates across the public and third sectors. We provide advice and support to local government and authorities in a professionally independent manner.

Background

Minimum Unit Pricing (MUP) in Scotland was introduced in the Alcohol (Minimum Unit Pricing) (Scotland) Act 2012, and came into effect in May 2018. The legislation imposes a minimum price of 50 pence per unit of alcohol sold, and the stated objective is 'to protect and improve public health and attain social benefits by reducing alcohol consumption'.¹ As part of the Scottish Government's requirement to report on the impacts of the policy after five years of implementation, NHS Health Scotland (now part of Public Health Scotland) was funded to conduct a comprehensive independent evaluation seeking to answer two questions:

1. Has minimum unit pricing contributed to reducing the health and social harms related to alcohol?
2. Are some people and businesses more affected (positively or negatively) than others?

The evaluation programme is described in detail in a separate protocol paper.² Public Health Scotland's MUP evaluation portfolio comprises 12 studies, each designed to contribute to a robust package of evidence that covers four outcome areas:³

1. Implementation and compliance. Assessing the compliance with MUP; barriers and facilitators to implementation; and public attitudes to MUP.
2. Alcoholic drinks industry. Assessing how the alcoholic drinks industry responds to MUP and the economic impact on the alcoholic drinks industry in Scotland.
3. Consumption. Assessing the impact of MUP on alcohol consumption in Scotland, including where people get alcoholic drinks from, and how changes in consumption differ by age, sex, deprivation and pattern of drinking.
4. Health and social harms. Assessing changes in a number of alcohol harms, including alcohol-related hospital admissions and deaths; harms to children and young people; alcohol-related crime and disorder; and unintended harms

such as increased consumption of other harmful substances, as a result of MUP.

In addition to research funded by Public Health Scotland, there has been a considerable amount of academic and grey literature evaluating MUP. The evidence synthesis described in this protocol will gather, appraise, analyse and synthesise this body of evidence to answer the MUP evaluation research questions. The initial literature search will focus on MUP in Scotland, but that literature may be complemented by subsequent targeted searches intended to fill any emerging gaps in the evidence base, potentially including evidence on pricing policies in other legislatures.

Minimum unit pricing is likely to produce a complex range of responses and outcomes, and the system into which the intervention was introduced will likely adapt to the intervention in complex ways. While the primary outcome of interest is impacts on population health, it is also necessary to understand what other impacts MUP may have had or contributed toward, and how these are distributed across different parts of society and the alcoholic drinks industry. Fittingly, the existing research evidence on the impacts of MUP is diverse in terms of the research questions asked and the methods used to answer those questions. The aim now is to synthesise the relevant evidence collected from across the breadth of studies. As is often the case with complex social interventions that are not easily evaluated using experimental methods, a traditional systematic review approach is not appropriate to synthesising the evidence on MUP.^{4,5,6} Following consultation with methods experts, the review team has designed a theory-based evidence synthesis drawing on aspects of realist synthesis and process tracing.

Realist synthesis is designed to allow us to understand the effects of complex interventions in complex systems.⁷ The method focuses on explaining what it is about an intervention that contributes to an outcome, why and how it does so, for whom, and in what contexts.⁴ Where typical systematic reviews aim to control all factors other than the intervention and the outcome, which is valuable in evaluating clinical effectiveness, a realist approach to synthesis acknowledges that the context-sensitive responses of individuals to a social intervention are an inextricable part of the mechanisms of that intervention, rather than something that can be

controlled for when seeking to understand the adaptive and context-sensitive responses of individuals to a social intervention.⁴ The realist approach is particularly valuable in examining complex social interventions where randomised controlled trials are impractical and reviews are reliant on evidence using more diverse, less controlled research methods.⁵

Realist synthesis methods literature encourages reviewers to reflexively tailor methods to their evidence needs. Consistent with this, the evidence synthesis described in this protocol does not adhere rigidly to a realist synthesis method, but instead comprises a plan for synthesis incorporating aspects of realist synthesis where they will add value to the analysis of the evidence base on the impacts of MUP within the resource restrictions of the project. In addition to using aspects of realist synthesis to reach deeper, explanatory understandings of the contexts and mechanisms underpinning the impacts of MUP, we will integrate aspects of process tracing. This will allow more robust conclusions about the extent to which observed outcomes were caused by MUP rather than potential alternative explanations.

Process tracing is a method for tracing the causal mechanisms by which an observed outcome was produced by an intervention, and involves the use of systematic and transparent tests to establish the extent to which a set of causal mechanisms can be validated by the evidence, and the relative validity of competing causal explanations of the outcome.⁸ Process tracing is often used within a realist framework to improve evaluators' ability to test the mechanisms they identify.⁹ It helps evaluators to produce robust high-level assessments of causal mechanisms and complements the strength of realist synthesis in producing detailed, low-level understandings of specific social groups and contexts. As such, this combination of methods will enable the evaluation team to answer the research questions, which are concerned with both population-level and group-dependent impacts of MUP.

The outcome of the synthesis will be a robust, evidence-based, theoretical model of the effects of MUP, and conclusions about the extent to which the evidence validates a claim that the observed effects were caused by MUP, compared to potential alternative explanations. These outcomes will be complemented by the results of a cost consequence analysis (CCA) that describes the costs and benefits of MUP identified in the evaluation studies.

Methods

In line with the realist approach, the specific methods of the evidence synthesis may adapt in response to analysis of the evidence, but the review will broadly take the following steps:

1. Formulation of initial programme theory (IPT) in the form of a hypothesis map and a set of if/then statements based on the review team's existing understanding of MUP.
2. Stakeholder engagement to:
 - a. consult on, and refine, the IPT and the design of the evidence synthesis
 - b. identify potential alternative explanations for observed outcomes that can be tested against the evidence.
3. Identifying relevant literature, combining literature already known to the review team with literature identified through searching for and screening academic and grey research literature.
4. Critical appraisal of the quality of studies.
5. Data extraction.
6. Data synthesis.
7. Additional targeted literature searches (as necessary).
8. Assessing the evidence against alternative causal explanations.
9. Producing a revised, evidence-based programme theory.

The review will be limited to academic and grey research literature. Realist synthesis can include the use of a broad range of different types of evidence and information beyond empirical evidence. However, in the case of MUP the research team anticipates that the empirical research literature has sufficient depth and breadth to

facilitate an in-depth understanding of the impacts of MUP without the need to introduce non-empirical literature.

Review team

The review team is led by Clare Beeston, who is the guarantor of the review. The initial hypothesis map and supporting if/then statements were drafted by the PHS MUP Evaluation project team. Screening of academic literature and data extraction will be conducted principally by Chris Patterson (CP) and Stefania Greci (SG). The cost consequence analysis will be conducted by Neil Craig and Neil Chalmers. Writing up results will be conducted collaboratively by the study team. The design and conduct of the review are informed by an advisory group of experts from academia and advocacy communities with methodological expertise on evidence synthesis and the evaluation of public health interventions, and topic-specific expertise on the lived experiences of people in recovery from alcohol dependency. Those experts include Dr Corinna Elsenbroich, University of Glasgow; Prof. Ruth Garside, University of Exeter; Michaela Jones, Scottish Recovery Consortium; Prof. Carole Longson; and Prof. Harry Rutter, University of Bath.

Some members of the review team have been involved in the planning or conduct of studies that will be included in the review, or have existing professional relationships with researchers who have worked on other relevant studies. Double-coding will be conducted in the processes of screening and critical appraisal by CP and SG. In any case where either CP or SG are authors of a piece of evidence that is being appraised, the critical appraisal will be conducted by another colleague to mitigate the potential influence of conflicts of interest. Neither CP nor SG were involved in any previous MESAS evaluations of MUP to be included in this evidence synthesis. CP is an author of an NIHR-funded study into the unintended consequences of MUP.

Initial programme theory

The evidence synthesis will be structured around an initial programme theory, presented in both a hypothesis map (Appendix A) that illustrates key contexts, mechanisms and outcomes of the intervention, and a set of if/then statements

(Appendix B) that presents hypothetical propositions underpinning the programme theory.

At a high level, the initial programme theory of change reflects a chain of plausible relationships – to be tested through synthesis of the evidence – by which retailer compliance with MUP led to changes in the price, affordability, purchasing and consumption of alcohol, ultimately impacting on alcohol-related health harms. However, the programme theory recognises that that process is complex and not necessarily linear, so aims to capture a range of additional phenomena that influence, or are influenced by, that main chain.

Conceptualising the anticipated mechanisms and impacts of MUP as a model will help to structure analysis of the evidence identified in the literature. The programme theory will be refined as the evidence is appraised and synthesised, ultimately producing a more robust, evidence-informed programme theory that evidences and explains the impacts of MUP. This approach takes into account the complex, non-linear nature of the impacts of MUP, where outcomes are likely to be influenced by multiple different factors and where those outcomes may also influence the system through feedback mechanisms. It also allows for the complex system to be described in terms of simple, discrete explanatory statements that can be tested against the evidence and refined if necessary. Mapping MUP as a complex system instead of a linear set of steps is beneficial in understanding both how different contexts and mechanisms might support or undermine the intervention, and how the intervention may create feedback loops that change the impacts of the intervention and how those impacts are distributed.

The initial programme theory was constructed by the review team in a hypothesis mapping exercise drawing on our expertise and knowledge of alcohol, public health interventions in general, and MUP specifically. The initial programme theory will be refined further during consultation with expert stakeholders (see Stakeholder Engagement, below) prior to evidence synthesis. This process will ensure that any potentially important aspects of the system in which MUP has been implemented are not omitted from analysis of the literature.

Stakeholder engagement

The review team will commission the Scottish Community Development Centre (SCDC) to conduct a stakeholder engagement exercise with people with lived experience of recovery from alcohol dependency and members of the Evaluation Advisory Groups for the different MUP evaluation studies. The SCDC is a national lead body for community development in Scotland with experience and expertise in community engagement, participation and co-production. In addition to adding value to the project through these extensive skills and experiences, the outsourcing of the stakeholder engagement to a third party is designed to maximise the objectivity of the engagement exercise.

The exercise includes two proposed events, both likely to be conducted online. The first event is planned for October 2022. The event will involve seeking stakeholders' input into whether the initial programme theory and the design of the review are reasonable and appropriate, and will allow time for that feedback to inform the evidence synthesis. Stakeholders will be provided with accessible information about the proposed design of the evidence synthesis and, through discussion, will have an opportunity to improve the design by adding insights from their professional or lived experiences. Stakeholders will also be asked to consider and discuss what has been done in the MUP evaluation programme to date and the future plans for the evidence synthesis, to identify any potential limitations in the evidence base or methods that may limit our ability to address the research questions. The second event will be conducted in February or March 2023, and will comprise a consultation on whether the review team's interpretations of the evidence are justified.

In addition to the engagement exercise conducted by SCDC, the MUP Evaluation project team will also engage with researchers studying MUP, discussing the planned design of the evidence synthesis with a view to harness academic expertise, where appropriate, to make that design more robust.

Information sources

The review will draw on three initial categories of research literature:

1. MESAS-funded studies: MUP evaluation studies funded by Public Health Scotland (formerly NHS Health Scotland) as part of the MESAS (Monitoring and Evaluation Scotland's Alcohol Strategy) programme.
2. Separately funded studies: Relevant studies known to MESAS, but not funded by MESAS, that are integral to the evaluation of MUP.
3. Additional academic and grey literature research about MUP.

Categories 1 and 2 do not require a literature search as these studies are already known to the MESAS programme. Category 3 requires literature searches to identify any relevant academic and grey research literature that was neither funded by Public Health Scotland nor previously known to the MESAS programme.

In line with the realist synthesis approach, additional literature searches may be conducted to try to identify evidence relevant to any aspects of the programme theory that are not explained following synthesis of evidence from categories 1, 2 and 3. These targeted searches will be designed to find academic and grey literature evidence that might help further understandings of specific mechanisms. This may include evidence that is not specifically about MUP, such as evidence about alcohol pricing policies in other legislatures, or evidence about pricing policies for other commodities.

Eligibility criteria

The review will include grey and academic research literature using a diverse range of research designs to address one or more of the following evidence needs:

- Provide quantitative estimates of change (e.g. controlled observational studies and natural experiments).

- Provide qualitative understandings of mechanisms underpinning quantitative estimates of change.
- Provide qualitative understanding where a quantitative study is unavailable, or where a qualitative study may augment understanding of quantitative evidence.
- Provide qualitative understanding of people's lived experience of MUP in Scotland.

Eligible studies must have been published in academic or grey literature in the English language between 2018 to 2023 and must use primary data to investigate the effects of MUP on one or more of the following:

- Compliance, implementation and attitudes.
- The alcoholic drinks industry.
- Consumption (individual or population reductions or changes in patterns).
- Health and social harms (including displacement of spending, substitution to alternative products/substances, impacts on services).

Initially, selected literature will specifically pertain to MUP in Scotland, and not comparable alcohol pricing interventions in other legislature, except where those interventions are used as a comparator. Evidence relevant to other interventions or legislatures may be introduced following analysis of initial literature to add explanatory depth to under-evidenced aspects of the programme theory. Searches for this additional literature will not be restricted to the time period to which searches for MUP-related literature will be restricted.

Research about MUP must be set principally in Scotland, although some studies will provide data for comparative purposes (e.g. regions of England). Populations of interest include:

- adults who drink alcoholic drinks, particularly those drinking to hazardous or harmful levels

- children and young people who consume alcoholic drinks
- populations directly or indirectly affected by the use of alcoholic drinks
- producers/distributors/wholesalers/retailers of alcoholic drinks
- those enforcing compliance with alcohol legislation
- services or professionals providing support for people affected by alcohol.

Studies must meet quality standards to be included. See the Critical Appraisal section for more detail.

Search strategy

An experienced public health librarian from Knowledge Services at Public Health Scotland will work with the review team to build a search strategy that captures relevant academic and grey research literature meeting the eligibility criteria listed above. The search strategy will make use of the bibliographic databases Scopus; Public Health Database; ASSIA; Sociological Abstracts; Sociology Database; EconLit; MEDLINE; Social Policy & Practice; and the Knowledge Network Library Search. Google search will be used to identify grey literature.

Public Health Scotland Knowledge Services will maintain a record of the search process, including decisions made; searches conducted and their results; and rationales for inclusion/exclusion of specific sources. These records will be archived in the project files on a secure server. Search results will be exported to citation management software (Sciwheel) and review management software (Covidence).

Research identified through the literature search will be screened for eligibility, with a primary round of screening based on titles and abstracts followed by a secondary round of screening based on full text. Double-screening will be conducted at each stage by CP and SG to reduce the risk of erroneous inclusion or exclusion.

Screening will be conducted using the Covidence software, which enables teams of reviewers to collaborate on screening in a transparent way that records decisions and measures inter-rater agreement.

Following the screening process, CP will produce a scoping output to briefly summarise the available evidence post-screening so that that project team can make decisions about any necessary changes to the methodology based on scope.

The selection process will be summarised in the final report using a PRISMA statement¹⁰ flow diagram that illustrates how many pieces of literature were identified, screened and retained at each stage of the process, including details of the distribution of different study designs within the relevant literature.

Critical appraisal

The team will critically appraise the quality of each study. In light of the range of different research methods we expect to find in the literature, no single critical appraisal tool will be sufficient. We will instead choose the critical appraisal tool appropriate to each study type. There are substantial differences in the structures and functions of different critical appraisal tools, meaning that comparing quantitative measures of quality between different tools is not appropriate. Instead, we will select an appropriate quality threshold for each selected critical appraisal tool, and apply that threshold consistently to each piece of research to which that tool is applied. Studies rated as not being of sufficient quality will be excluded from synthesis.

For quantitative observational studies, we will use the EPHPP Quality Assessment Tool.¹¹ This tool allows reviewers to systematically rate literature as strong, moderate or weak based on six quality criteria. We will exclude any studies that are rated as weak. If it is necessary to make any modifications to the EPHPP tool or its interpretation to make it suits the nature of the evidence base, these modifications will be reported and justified explicitly in the final report.

For qualitative studies, we will use the Critical Appraisal Skills Programme¹² (CASP) Qualitative Studies Checklist, which comprises ten questions designed to help reviewers to appraise qualitative research systematically. The CASP checklists do not produce a final score, but instead help reviewers to identify potential methodological weaknesses in qualitative literature that allow them to put the value of evidence in context within a review. As such, we will not apply quality scores to

qualitative studies, but will describe any methodological weaknesses in narrative form.

Data extraction and analysis

Data will be extracted from the full text of eligible documents using a data extraction framework in Microsoft Excel to enable systematic extraction of relevant information. The framework will be necessarily complex as it will need to capture a diverse range of evidence relevant to any of the mechanisms and outcomes identified in the hypothesis map, as well as to capture both quantitative and qualitative evidence. In line with the realist approach, data extraction will not focus exclusively on outcomes, but also any insights about contexts or mechanisms that emerge from close reading of the literature. For example, extracting and analysing all the evidence on businesses' compliance with the minimum price will help to understand both the extent to which businesses complied, but also causal insights into reasons why they did or did not comply, and how contextual factors may have influenced that compliance.

Synthesis

Structuring data extraction and analysis by hypothetical links within a programme theory will enable the research team to create a set of appraised, empirical evidence relevant to each hypothesised link. The synthesis process will involve looking across the breadth of evidence to generate an evidence-based understanding of the operation of each link. While the primary goal of the evidence synthesis is to answer the research questions, the process will also produce a comprehensive understanding of any unanticipated factors that exert an influence on the extent to which MUP works, for whom and in what contexts. As such, the process of assessing evidence corresponding to each pathway in the initial programme theory will enable the creation of a revised programme theory informed by the evidence.

Testing causal explanations

Drawing from process tracing methods, a set of formal tests will be applied to determine the extent to which the evidence supports the conclusion that observed outcomes were caused by MUP, as opposed to another explanation. While the nature of the intervention means that definitive proof of cause and effect is not possible, systematically comparing the relative strength of competing explanations will add robustness to any conclusions about the impacts of MUP. We will draw upon four tests described in the process tracing literature:¹³ straw-in-the-wind tests, hoop tests, smoking-gun tests and doubly decisive tests. Each of these tests is characterised by a different degree of strictness in terms of the ability of evidence to support or reject causal links. These thresholds range from straw-in-the-wind tests, which indicate increased or decreased plausibility without being decisive, to doubly decisive tests which allow us to decisively confirm one explanation and dismiss the others.

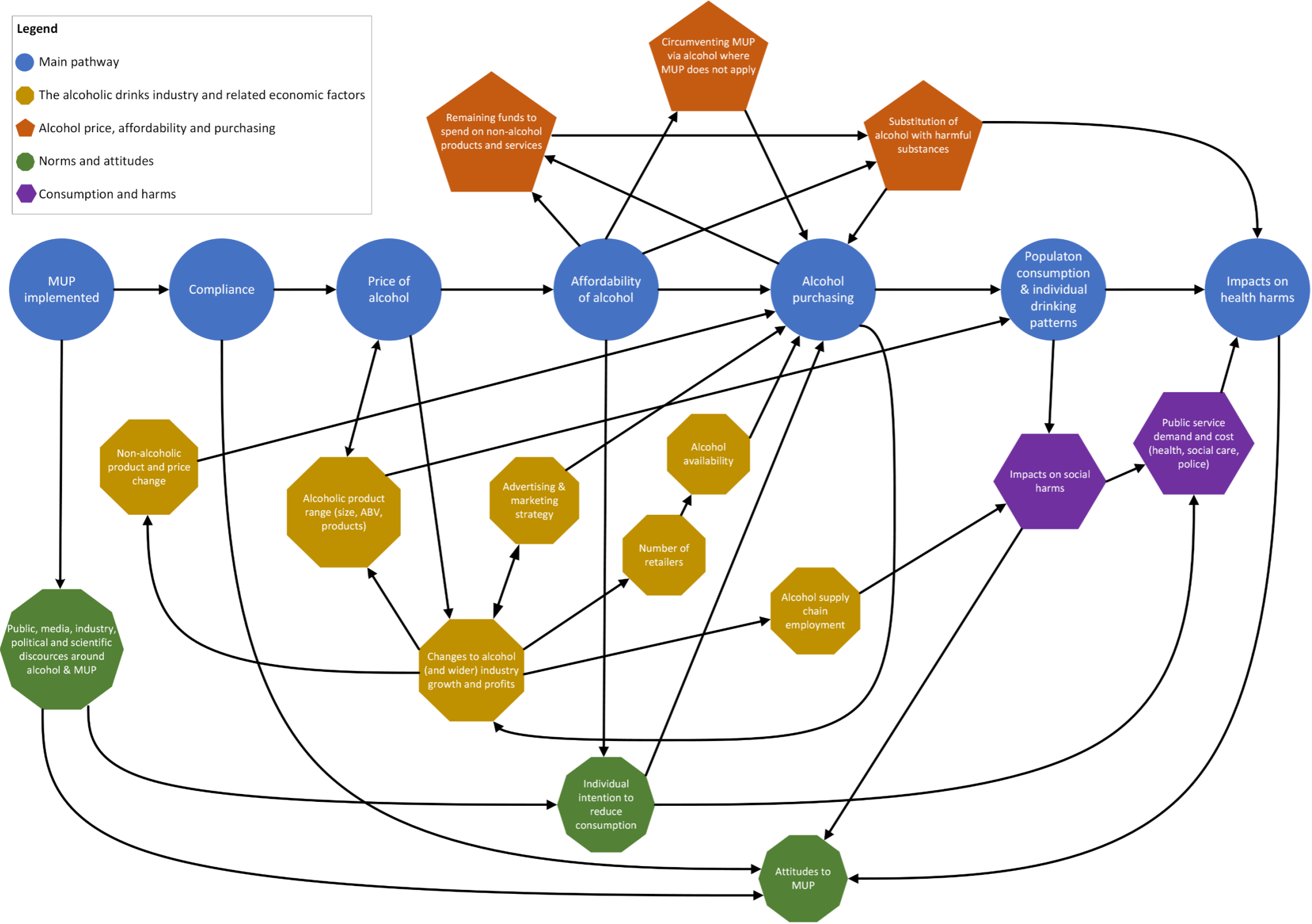
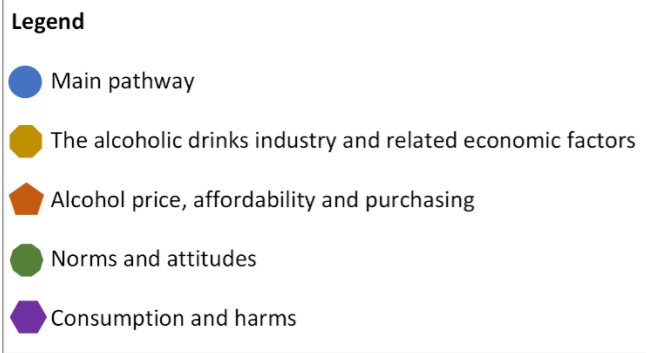
CMO configurations

In addition to a revised programme theory and a set of formal tests, analysis of the evidence will be expressed as CMO (context, mechanism, outcome) configurations. CMO configurations are descriptive, narrative propositions that seek to explain aspects of how an intervention works, and the use of the CMO framework helps to focus that explanation on the specific circumstances of that aspect of the intervention and whom it affects. The use of CMO configurations will complement the other outputs of the evidence synthesis by adding greater depth of explanatory understanding to how the observed outcomes came about.

Cost consequence analysis

The realist-informed evidence synthesis will be complemented by a cost consequence analysis (CCA), which will provide a framework within which to describe some of the costs, benefits and outcomes from the studies in the MUP evaluation portfolio. CCA has recently been advocated by the National Institute for Health Research as one of many useful forms of economic evaluation.¹⁴ CCA allows the costs and outcomes of an intervention to be presented in a descriptive format, leaving the decision maker to form a value judgement on whether benefits justify the costs of delivering an intervention. While CCA on its own does not allow an overall judgement of value for money to be made in terms of whether the value of the outcomes gained is within the 'willingness to pay' threshold of the decision maker, it allows decision makers to consider whether additional benefits measured in other studies would tip the balance of costs and benefits further in either direction.²

Appendix A: Initial hypothesis map



Appendix B: If/then statements

Fundamental assumptions

These evidence-based statements constitute the theory underpinning the more granular if/then statements of the programme theory:

- Alcoholic drinks have a negative price elasticity, which means that an increase in price results in a decrease in demand. There is strong evidence that the price of alcohol is inversely correlated with population alcohol consumption and alcohol-related harm. Therefore, increasing the price of alcoholic drinks reduces harm.
- Different social groups (e.g. age, gender, level of deprivation, type of drinker etc.) buy and consume different alcoholic drinks, and will therefore be affected by price changes in different ways, respond differently to those changes, and experience different health effects from the same changes in behaviours.

These support the main hypothesis on which MUP is based:

- If there is high retailer compliance with MUP:
 - the price per alcohol unit of alcoholic drinks previously <50ppu will increase
 - purchase and consumption of these products by those who used them will decrease, with differential effects for different social groups
 - population alcohol consumption (sales) will decrease
 - alcohol-related harm (social and health) will decrease.

If/then statements

The potential causal processes that underpin the fundamental assumptions are set out in greater detail in if/then statements corresponding to specific key components of the programme theory. These statements include positive, negative, intended and unintended impacts of MUP, as well as factors that may limit the power of the evaluation.

Implementation, enforcement and compliance

1. If statutory authorities communicated the legislation effectively and supported retailers to comply with it, then retailers will have been more likely to understand and comply with MUP.
2. If MUP is a mandatory condition of a license to sell alcohol (so that non-compliance risks loss of licence) and retailers feel that the condition is likely to be checked and enforced, then compliance will be high.
3. If retailers comply with MUP then the price of products that were previously <50ppu will increase, and the availability of products <50ppu will be eliminated.
4. If retailers comply with MUP then social perceptions of the acceptability of MUP may change, which will affect consumers' motivation to purchase alcoholic drinks.
5. If compliance is poor then some access to high-strength, low-cost alcoholic drinks will be maintained, limiting the impact of the intervention on price, affordability, consumption and harm.

Alcoholic drink prices, affordability and purchasing

The effects of a price change on purchasing are conditional on a change in affordability, and the affordability of alcoholic drinks is contingent on both consumers' budgets and the relative price of other commodities. For the purposes of the if/then

statements in this section, we have assumed that those broader economic contextual factors are unchanged, as controlling those factors is beyond the reach of the MUP intervention. As such, a price increase is assumed to produce a decrease in affordability. However, we recognise that those contextual factors may change, mediating the effects of price changes on consumption, and this will be addressed in our interpretation of the evidence.

6. All things being equal, if the price of alcoholic drinks increases then the affordability of alcohol will decrease, and alcohol purchasing will decrease.
7. If people's experiences of, and responses to, changing prices vary by socioeconomic, demographic or behavioural characteristics, then the impact on purchasing and consumption will vary based on those factors.
8. If the prices of alcoholic drinks change, then alcoholic drinks industry revenue will be affected, which will affect the provision and marketing of alcoholic drinks.
9. If the prices of alcoholic drinks change, pricing of non-alcoholic drinks may change, which will influence individuals' intent to choose non-alcoholic drinks over alcoholic drinks.
10. If the price of alcoholic drinks that were already >50ppu is decreased to 50ppu then consumption of those products will increase, increasing consumption and harms.
11. If the price of alcoholic drinks that were already >50ppu is unchanged, then people who previously consumed those products will not change their purchasing behaviours.
12. If the price of alcoholic drinks >50ppu increases, then people who previously consumed those products will be motivated to reduce their purchasing of those products.
13. If the prices of alcoholic drinks previously <50ppu increase then those previously purchasing alcoholic drinks <50ppu may find ways to purchase

alcoholic drinks from illicit or alternative sources to which MUP does not apply, and will be able to maintain consumption or limit reductions in consumption.

14. If the prices of alcoholic drinks previously <50ppu increase then those previously purchasing alcohol <50ppu may switch to other substances (e.g. illicit drugs, non-beverage alcohol, counterfeit alcohol) which will increase health and social harms.
15. If the prices of alcoholic drinks previously <50ppu decrease then those previously purchasing alcoholic drinks <50ppu may switch to different alcoholic drinks, and change individual consumption patterns (e.g. consuming fewer units in a day, but consuming them faster).

Consumption and harms

16. If there is a reduction in population consumption of alcohol, there will be reductions in the social and health harms caused by alcohol.
17. If drinkers reduce consumption, then the long-term negative health impacts of high alcohol consumption will be reduced.
18. If drinkers reduce consumption, then the long-term social impacts of high alcohol consumption will be affected.
19. If individuals change how or what they drink, or where they purchase alcoholic drinks, the frequency and intensity of individual consumption will change, affecting some social and health harms.
20. If health and social harms change, then the demand for relevant public services will change.
21. If individuals' intention to reduce consumption increases, then individuals may seek support in reducing consumption, which will increase demand on relevant public services.

22. If those currently at risk of alcohol harms do not change their consumption substantially, then there will be no reduction in population harms.
23. If people dependent on alcohol reduce their consumption, then the number of people experiencing alcohol withdrawal will increase, which will lead to an increase in health and social harms.
24. If the increased prices of alcoholic drinks decrease the amount of money that people are able to spend on non-alcohol purchases, then consumption of essential commodities and services will decrease, which will lead to an increase in health and social harms.
25. If increased prices discourage non-drinkers from taking up drinking by increased prices, then there will be a decrease in the social and health harm associated with that potential consumption of alcoholic drinks.
26. If increased prices motivate those at the beginning of their drinking careers from drinking as much as they might otherwise have done, then over time the mean consumption of the most harmful drinkers will decrease.

The alcoholic drinks industry and wider economy

27. If price differentials between different products and retailers change, then consumers will change the products they purchase and the places they purchase them from, impacting the alcoholic drinks industry.
28. If the alcoholic drinks industry reformulates or reconfigures products to maintain current prices, then the alcohol content of products purchased will decrease, leading to a decrease in purchasers' consumption of alcohol.
29. If retailers comply with MUP, then retailers will be less inclined to stock products that were previously <50ppu due to decreased customer appeal, and the product lines stocked by retailers (and produced by manufacturers) will change.

30. If individuals choose to substantially reduce or cease their alcoholic drink consumption, then their disposable income will increase.
31. If consumption reduces substantially, then growth and profit of the alcoholic drinks industry will be affected, with impacts on business viability, employment, alcoholic drink availability and marketing strategy.
32. If consumption does not reduce substantially, then growth and profit of some or all sectors of the alcoholic drinks industry will increase, with impacts on business viability, employment, alcoholic drink availability and marketing strategy.
33. If consumers in Scotland choose to purchase alcoholic drinks from English retailers, then the revenue of the alcoholic drinks industries in each country will be affected.

Social norms and attitudes

34. If MUP leads to noticeable changes in prices and products stocked, then consumers will consider the message that alcoholic drinks are not ordinary commodities and change their attitudes towards alcoholic drinks.
35. If the majority of people feel that MUP is beneficial or that MUP does not affect them, then population attitudes to MUP will be neutral or positive.
36. If the majority of people feel penalised by MUP, or perceive it as harmful, then population attitudes to MUP will be negative.

Factors that may limit the power of the evaluation programme

37. If only a very small proportion of alcoholic drinks increase in price, then any resulting decrease in consumption will not be sufficiently large to be observed.
38. If consumption change occurs in those at risk of long-term harm or those at the start of a harmful drinking career, then the full impact of MUP on alcohol-related harms will not be detected within the time frame of the evaluation.

39. If the alcoholic drinks industry changes prices or product lines in England to be consistent with prices or product lines in Scotland, then the usefulness of England as a control will be limited, and the evidence of impact will be weakened.
40. If factors (other than price) known to influence alcohol purchasing decisions change materially at or around the time of the introduction of MUP, then the ability to isolate the impact of MUP from other drivers will be reduced.

References

- ¹ The Scottish Parliament. Alcohol (Minimum Pricing) (Scotland) Bill: Policy Memorandum. Edinburgh: The Scottish Parliament; 2011 Oct.
- ² Beeston C, Craig N, Robinson M et al. Protocol for the evaluation of Minimum Unit Pricing for alcohol. Public Health Scotland; 2019 Jun.
- ³ Outcome areas and studies of evaluation of MUP - Evaluation of minimum unit pricing (MUP) - Alcohol - Health topics - Public Health Scotland [Internet]. [cited 2022 May 13]. Available from: www.healthscotland.scot/health-topics/alcohol/evaluation-of-minimum-unit-pricing-mup/outcome-areas-and-studies-of-evaluation-of-mup
- ⁴ Hunter R, Gorely T, Beattie M, Harris K. Realist review. *Int Rev Sport Exerc Psychol*. 2022 Jan 18;1–24.
- ⁵ Gledhill A, Forsdyke D. Realist synthesis in sport and exercise medicine: “time to get real”. *Br J Sports Med*. 2021 Oct;55(19):1064–1065.
- ⁶ Astbury B, Leeuw FL. Unpacking black boxes: Mechanisms and theory building in evaluation. *American Journal of Evaluation*. 2010 Sep 1;31(3):363–381.
- ⁷ Jagosh J. Realist synthesis for public health: building an ontologically deep understanding of how programs work, for whom, and in which contexts. *Annu Rev Public Health*. 2019 Apr 1;40:361–372.
- ⁸ Wadeson A, Monzani B, Aston T. Process tracing as a practical evaluation method: comparative learning from six evaluations. *Monitoring and Evaluation News*. 2020.
- ⁹ Bouyousfi SE, Sabar M. Realistic evaluation and the process tracing method: A combined approach to scrutinize causal mechanisms. *CJPE*. 2022 Apr 26.
- ¹⁰ Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med*. 2009 Aug 18;151(4):264–9, W64.
- ¹¹ Effective Public Healthcare Panacea Project. EPHPP Quality Assessment Tool for Quantitative Studies [Internet]. Quality Assessment Tool for Quantitative Studies.

[cited 2022 Sep 30]. Available from: www.ehphp.ca/quality-assessment-tool-for-quantitative-studies/

¹² CASP. CASP Critical Appraisal Skills Programme [Internet]. CASP Critical Appraisal Skills Programme. [cited 2022 Sep 30]. Available from: <https://casp-uk.net/casp-tools-checklists/>

¹³ Collier D. Understanding Process Tracing. APSC. 2011 Oct;44(04):823–830.

¹⁴ Hunter R, Shearer J. Cost-consequences analysis: An underused method of economic evaluation. National Institute for Health Research; 2014.