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A rapid evidence review of interventions to prevent alcohol-related violence

Simon Ruda and Dr Kizzy Gandy

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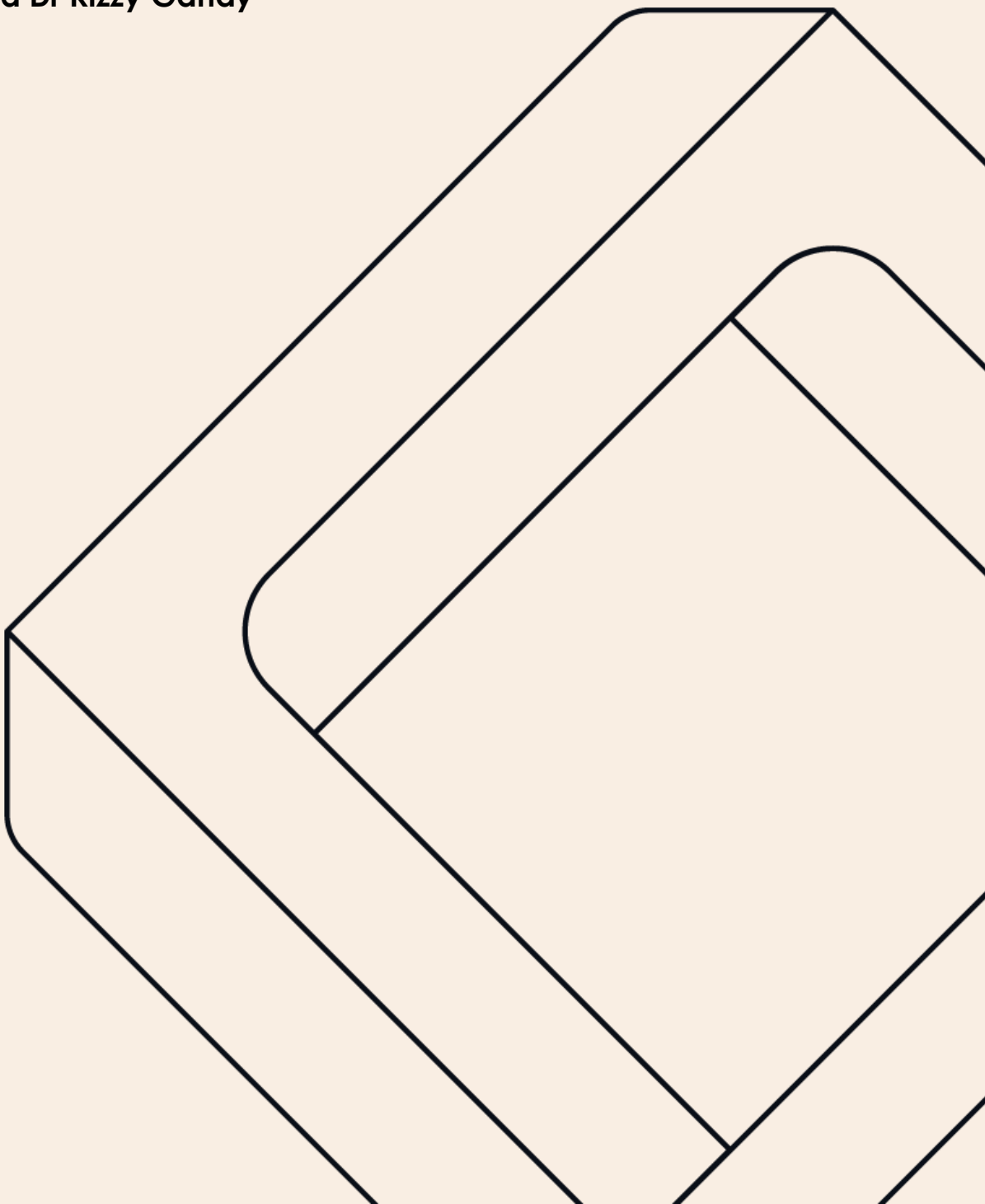

Contents

1 Background

1.1 The purpose of this document

This document aims to support implementation of the Western Australian Model for Violence Prevention (WA MVP) Pilot through a rapid evidence review (RER) of interventions to reduce alcohol-related violence.

The WA MVP Pilot involves collecting information on alcohol-related presentations at Royal Perth Hospital (RPH) Emergency Department (ED) for those aged 16 years and over. Deidentified and aggregated information about the locations of where alcohol was obtained and where injuries occurred is shared with the WA MVP Pilot cross-agency working group to determine hotspots for harm, and to identify, develop and implement alcohol-related violence prevention strategies with other key stakeholders.

See Annex 1 for a summary of the context for the WA MVP Pilot.

1.2 The structure of this document

This document will first provide an overview of best practice to develop alcohol-related violence prevention strategies, highlighting where a rapid evidence review fits among other critical activities. The document will then describe the scope of this RER, key findings, and outline next steps for the WA MVP Pilot cross-agency working group to use this document in practice.

1.3 How to develop alcohol-related violence prevention strategies

The WA MVP Pilot aims to implement strategies (interventions) which prevent alcohol-related violence. This involves influencing people's behaviour to either drink less alcohol or not act in ways that cause violence and injury. A key input for developing strategies in the WA MVP Pilot is this RER. This section will explain where the published literature fits within a best practice behaviour change project.

Changing people's behaviour is not straightforward. Since the creation of the world's first government Behavioural Insights Team in the UK in 2010, behavioural science has developed into a specialty among academics and practitioners. There are now at least 100 behavioural insights organisations globally and many universities offer degrees in behavioural science. In Australia alone, there are government behavioural insights units in the NSW Government, VIC Government, QLD Government, and Commonwealth Government.

Behavioural science combines ideas from economics, psychology, neuroscience, and human centered design to understand and influence the choices people make. In public policy, behavioural science is used transparently to help people make better decisions for themselves and society. For example, behavioural science has been applied to citizen communications to encourage earlier tax filing which avoids a last-minute rush and a poor taxpayer experience.[1]

There is no grand theory in behavioural science to predict behaviour. Instead, a collection of research findings point to two main insights:[2]

1. Evolutionary advantage explains the way our brain makes decisions.
2. Context matters because a 'successful' decision is based on surviving a specific situation.

Evolutionary advantage explains the way our brain makes decisions

Humans have limited cognitive capacity. To conserve brain energy, we rely on cognitive short-cuts for most of our decisions, such as following social norms, and avoiding regret and loss. These short-cuts evolved over time because in most situations they helped us survive.[3] However, sometimes in our modern world they lead to suboptimal choices, e.g., as a hunter-gatherer, fitting in with the group gave us protection from being attacked, but today social norms such as spending a lot of time on social media can be detrimental to our health.[1]

Humans have limited self-control. We evolved to prioritise our survival in an environment of scarcity and danger, so we tend to favour benefits in the short-term (e.g., filling our belly with the food in front of us) over those in the long-term (e.g., preventing obesity). In our modern environment of relative abundance and safety, a good life often requires prioritising the long-term over the short-term, e.g., saving money for retirement.[2]

Context matters because a 'successful' decision is based on surviving a specific situation

The decision strategies we use are shaped by the environment and our past experiences.[4] Most of the strategies we use are cognitive short-cuts, whereas others are more deliberate.[5] Our environment is very complex and lots of information is taken in from different senses. The most salient information can override or combine with other information to trigger a particular decision strategy. Our past experiences will also affect what information we pay attention to, how we interpret the information, and how we respond.[6]

Because our decision strategies are triggered by the decision environment, the main way that behavioral scientists influence behaviour is by altering the decision environment. This might involve increasing the salience of a particular piece of information or making positive behaviours easier to perform and negative behaviours harder to perform.[7]

Behavioural context-dependency means it is difficult to know ex-ante which strategies to change behaviour will work. Furthermore, strategies that show impact in the short-term don't always work in the long-term, or in different settings, because of variations in context. Behavioural scientists therefore recommend testing behaviour change strategies for impact where they are implemented, even if they are "evidence-informed".[8]

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[1] While heuristics are functional in stable environments, they could lead the user astray in environments that are structurally different (that is, where the background variables are fundamentally different), noisy (for instance, where the relationships between variables change across contexts), or dynamic (where, for example, these relationships change with time).

Behaviour Change Project Steps

There are generally 4-5 steps in a best practice behavioural science project. The methodology is consistent across key organisations in the behavioural science sector, including the original UK Behavioural Insights Team, Ideas42 in the US, Behaviour Works at Monash University in Australia, and behavioural insights units within Australia government agencies. Here we outline the steps from the UK Behavioural Insights Team's TESTS guide[9] in relation to developing prevention strategies for the WA MVP Pilot. TESTS is a pneumonic which stands for target, explore, solution, trial, scale.

Target – (a) identify whose behaviour you are seeking to change, e.g., the behaviour of licensed venue staff, alcohol consumers, or bystanders; and (b) identify the specific behaviour are you trying to change, e.g., reduce serving alcohol to intoxicated patrons, reduce alcohol consumption by consumers, or increase bystander action to de-escalate aggression. It is also helpful to specify the level of behaviour change that can reasonably be expected and the timeframe for change.

This step is recognised as important among alcohol researchers too: *"The most suitable intervention may depend on whether the focus is on alcohol consumption, alcohol-related harms, or both. Strategies relating to alcohol consumption per se typically focus on reducing service to individuals who are intoxicated or who are younger than the legal drinking age. Strategies that focus on alcohol-related problems, on the other hand, may successfully reduce the problem without necessarily changing alcohol consumption, although reducing alcohol consumption may be part of the focus".*[10]

Explore – map the context where the targeted behaviour takes place to identify how the environment triggers decision strategies, e.g., if a drinks promotion sign offering $5 off the price of cocktails and beer in an upmarket bar leads to a larger increase in sales for cocktails compared to beer, it might suggest the environment is triggering mental accounting. This decision short-cut involves people grouping their expenditures into different categories, with each category corresponding to a separate mental account. Each account has its own budget and its own separate reference point. If cocktails belong in a mental account for luxury beverages and beer belongs in a mental account for everyday essentials, a $5 discount on cocktails might be perceived as more valuable in the context of an upmarket bar than $5 off beer, resulting in greater sales of cocktails.[2] As cocktails contain more alcohol than beer, mental accounting could lead to greater intoxication.

This is just one example of a decision strategy. There are hundreds of decision strategies that could be triggered in any given context so the explore phase of a project often takes considerable time and involves ethnography, interviewing or surveying stakeholders, customer journey mapping, and analysis of administrative data to identify behavioural patterns. Refer to this guide https://www.bi.team/publications/explore/

The importance of context to developing behaviour change interventions is also recognised by alcohol researchers: *"Interventions rarely work as 'off-the-shelf ' models, but rather must be understood and adapted, based on their underlying characteristics and the principles that likely account for their effectiveness, which will vary not only according to the characteristics and implementation of the intervention, but also depending on the context in which the intervention is implemented".*[10]

Solution – solutions typically involve changing the decision environment to (a) trigger a different decision strategy (e.g., shift the default of buying endless rounds of drinks in a pub by prompting social groups to pre-select the maximum number of drinks they will order with an option to split the cost) or (b) change the outcome of the existing decision strategy (e.g., if people mistakenly think the social norm at university is to get drunk on weekends, show them evidence that most people drink responsibly).

There are a number of frameworks to develop solutions. While these function as short-cuts to reading the entire behavioural science literature, they should not be seen as definitive as the field is constantly evolving. In addition, sometimes the most effective and efficient solutions come from practices people have already implemented on the ground informally or ad hoc.

One solution framework developed by the Behavioural Insights Team is EAST – which is a pneumonic for making the desired behavour easy, attractive, social and timely.[7] Other frameworks to map contextual insights to solutions are the COM-B model and the Behaviour Change Wheel.[11]

It can be helpful to conduct an RER when generating potential behaviour change solutions and making judgements about which solutions are likely to work. This is where this RER will fit within the WA MVP Pilot. However, stakeholder consultation, co-design and prototyping are also essential for ensuring the acceptability and practicality of selected interventions.[12]

It is important to note that the more proximal the intended behavioural outcome, the more likely the solution is to work. Outcomes that are distal are heavily influenced by system equilibrium forces.[13] Therefore, it's helpful to develop a theory of change for the selected solution to be clear about what behavioural outcomes are expected to change and the associated mechanisms of change (the decision strategy). For example, the proximal outcome of training venue staff on the responsible service of alcohol is increased knowledge. The distal outcome is fewer intoxicated patrons. The distal outcome depends on a number of other influences such as whether the venue manager emphasises staff compliance with responsible service of alcohol laws, and this depends on the level of police enforcement and wider cultural norms.

Trial – Even when there is evidence that an intervention has been successful in another context, it should be tested in the new implementation setting. Behaviour is context-dependent and very small features of the decision environment which are unlikely to be documented in published evaluations can influence an intervention's impact.

The most rigorous evaluations have a counterfactual. This won't always be feasible for evaluating individual components of multicomponent interventions due to limited sample size or small effect size.

The WA MVP Pilot will likely implement many different interventions which will be evaluated collectively with a rigorous quasi-experimental design called difference-in-differences.

Scale – If an intervention is successful in a pilot or small-scale study it should be scaled up to benefit the wider population. However, there is a well-documented risk of the effect size diminishing at greater scale which is called "voltage drop".[14] This can occur for a number of

reasons, including variation in implementation practices, differences in the population being targeted, and system dynamics such as equilibrium effects. One of the best voltage drop mitigation strategies from implementation science is to understand the mechanisms of change and contextual influences on those mechanisms during the trial phase so these can be monitored during the scaling phase.[15]

In conclusion, the published literature is an important component of each step of a behaviour change project but cannot substitute for:

- Thoroughly mapping the observed drivers of target behaviours in the context in which they occur (in the Explore phase).
- Designing bespoke behaviour change interventions through co-design with implementation stakeholders who have invaluable knowledge about what's likely to work on the ground and the feasibility of implementation (in the Solution phase).
- Testing the impact of the intervention and understanding the mechanisms of change and the contextual influences on those mechanisms to ensure successful scaling (in the Trial phase).
- Monitoring the mechanisms of change and adjusting the intervention if they are not observed (in the Scale phase).

Therefore, for the WA MVP Pilot, this RER should be used as a starting point for ideas generation during the Solution phase rather than as a handbook of off-the-shelf interventions to be implemented.

2 This Rapid Evidence Review

2.1 What is an RER

Rapid evidence reviews (RERs) are ideal for the public sector where evidence is required in a timely and compressed manner to inform policymaking.

According to Monash University, an RER is differentiated from conventional systematic reviews by virtue of one or more deliberate simplifications,[16] such as:

- Focus on a narrow topic that will return few search results
- Use of short time frames when searching (e.g., only searching for studies published in the last 2-5 years)
- Use of relatively few databases
- Exclusion of certain types of literature (e.g., primary studies)
- Use of only one researcher (rather than two) to screen and extract results
- Extraction of relatively few fields of information from the paper
- Simple rather than complex synthesis of results
- Limited or no quality assessment of included reviews
- Creating short or simple outputs

Due to their simplification, RERs generally include less publications than systematic reviews and focus on only the most recent or relevant research. For many topics, systematic reviews already exist and can be included in rapid evidence reviews, making them a 'review of reviews'.

2.2 Objective of this RER

This RER aims to summarise potential interventions that could be trialled as part of the WA MVP. Therefore, interventions that have been evaluated in the literature were selected based on their relevance to the WA MVP Pilot's Theory of Change (ToC). The ToC was co-designed with the WA MVP Pilot working group (Annex 2).

The ToC states that the primary intended long-term outcome of the WA MVP Pilot is to reduce alcohol-related presentations at RPH ED. To achieve this, a number of long-, medium-, and short-term outcomes must be achieved first. These pre-cursor outcomes fall into two categories: (1) reducing consumption of alcohol at levels associated with risky behaviours, including crime, aggressive driving, interpersonal violence, and self-inflicted injury.[17] (2) directly reducing violence and injury. This is summarised in the table below.

Table 1. ToC outcomes which are causally linked to reducing alcohol-related presentations at RPH ED

Short-term outcomes	Medium-term outcomes	Long-term outcomes
Increased alcohol substitution to alternative healthy beverages	Reduced rate of excessive drinking	Reduced aggression to frontline staff
Reduced sales of alcohol to intoxicated consumers		
Consumers are committed to low-risk drinking		
The places people visit during / after drinking are low risk for aggression	Reduced aggression in the community	Reduced violence in community
	Reduced means to cause bodily harm (e.g., knives)	
	Reduced alcohol-related offending and anti-social behaviour	
The places people visit during / after drinking are low risk for injury	Reduced risky behaviour for injury (e.g., climbing trees)	Reduced injury

2.3 RER Parameters

The core differentiator of the WA MVP Pilot from other alcohol harm minimisation programs in WA is the collection and sharing of de-identified patient data on the locations where alcohol-related harms occur. Therefore, the scope of interventions covered by this review is as follows:

In scope interventions:

- Interventions that aim to reduce risky drinking, violence or injury in geographic hotspots. Addressing the physical and social environment to reduce crime, aggression, and disorder is known as situational crime prevention.[2]
- Individual-level interventions that support behaviour change which can be implemented in a hospital setting after an alcohol-related ED presentation, or in a prosecution setting after a violent offence.

Out of scope interventions:

[2] Situational Crime Prevention (SCP) is an approach to preventing crime that was developed in the UK Home Office in the 1980s (most notably by the Criminologist Ronald Clarke) when burglary and vehicle crime were at record levels. The logic underpinning SCP can be summarised by the following equation: propensity to commit crime + plus opportunity to commit crime = crime. SCP interventions focus on reducing the opportunities for crime and have therefore been primarily concerned with identifying the settings where crime is most likely to occur and modifying them in order to reduce or pre-empt perceived opportunities for crime. SCP has seen marked success in reducing vehicle crime, mobile phone theft, burglary, property damage and other examples too. In fact, many scholars now understand the great crime drop (a large reduction in many types of volume crimes experienced in Western countries between the 1990s and early 2010s) by applying SCP principles to technological developments. For example, since cars became harder to steal (when central locking became ubiquitous and steering wheel locks were developed), vehicle crime fell dramatically and did not displace to other crime types; CCTV has been credited with reducing a range of crime types including property crime; and alley gating has had positive effects on domestic burglaries.

- Population-level interventions to reduce alcohol-related harm that are unlikely to be connected to specific hotspots, such as state-wide education campaigns
- Regulations and policies that focus on mandatory restrictions on alcohol supply such as minimum unit pricing and advertising bans.

The scope of the literature to be reviewed was 20-30 papers from the academic and grey literature. There are three existing summary evidence reviews which are complementary to this RER. To reduce duplication, the key findings from these documents will not be comprehensively rehearsed in this RER. Instead, the documents have been listed in the next section for the WA MVP Pilot working group to refer to separately. For ease of reading, sections of each document that summarise relevant findings have been highlighted.

Interventions that have not been rigorously evaluated because they are currently being implemented have been included where they align with existing evidence. One of the authors of this review (Simon Ruda) has worked in policing insights for more than 10 years and has helped several overseas police forces to design and implement interventions. He therefore brings real world experience to the question of what could work, and the likelihood of potential displacement effects, which informed his selection of interventions currently being implemented to include in this RER. Similar to well-evidenced interventions, these "yet to be evaluated" interventions are intended to spark discussion during the solution stage of a behaviour change project and should not be taken "off-the-shelf".

Because the impact of interventions will vary from context to context, this RER does not make comparisons between interventions in terms of their effect size. Instead, comparisons have been made at a high level based on the quality of evidence associated with each intervention. The evidence ratings are presented below.

Evidence ratings

- Strong evidence of effectiveness (+++) = multiple experimental studies in different contexts, at scale with consistent effects, and with metrics that are not just self-reported.
- Quite strong evidence of effectiveness (++) = similar to the above but some inconsistent effects or consistent effects only seen in an analogous policy area (e.g., crime reduction in general) but hasn't yet been applied to alcohol.
- Promising evidence of effectiveness (+) = the same as ++ but with more mixed results or evaluation method limitations such as less valid metrics.
- Ineffective (-) = a high-quality study found it didn't work and there is not enough other evidence to suggest it is still promising.
- Limited evidence = only correlations were examined which cannot account for selection bias, the sample size was not large enough to detect an effect, or the scale of testing was small (e.g., pilot).

These rating are based on the following principles: Experimental studies such as randomised controlled trials (RCTs) control for selection bias. This is not true for observational studies, even with the use of statistical techniques. However, experimental studies only provide evidence for a particular sample which means interventions need to be tested in multiple contexts to know if the results are generalisable. A recent review of 50 years of RCTs in the criminal legal

space finds that "Success in one time and place rarely ports well to another".[18] Therefore, this rating system emphasises that the extent of evidence is not the same as the extent to which interventions will work in the WA MVP Pilot. This is why this review has highlighted the TESTS methodology to develop prevention strategies.

2.4 Search methods

Papers were identified through a combination of database searches and expert-led identification.

Searches were conducted using the following databases:

- Google Scholar
- Open Google searches, to access published, non-academic research (i.e., grey literature)

The following Boolean search string was developed and used for keyword searches in Google Scholar:

- "alcohol related harm" OR "alcohol-related harm" OR "Cardiff Model" AND "RCT" OR "review" OR "experiment"

A general open Google search was also undertaken for evidence on reducing alcohol-related harm and the policy context in WA and Australia more broadly.

The POP Center website[19] and the ANZ SEBP website[20] were also reviewed.

The Director of the What Works Centre for Crime Reduction,[21] Rachel Tuffin, was asked if anything was missed. She pointed to a few additional studies including the Crime Reduction Toolkit.

Dr Geoff Barnes and other police crime prevention leads at an SEBP conference attended by Simon Ruda were asked for any further important studies.

Finally, the WA MVP Pilot working group also suggested additional studies to include based on their review of the first two drafts of this paper.

2.5 Inclusion and exclusion criteria

The following inclusion criteria were used to identify relevant articles from Google Scholar:

- Written in English language
- Published since 2020
- Studies conducted in Australia, New Zealand, United States of America, Canada or other countries with broadly similar contexts
- Review articles

The following exclusion criteria were used:

- Theses and working papers.

- Publications which did not describe the evaluation methodology.
- Studies which did not meet the "In scope" and "Out of Scope" criteria for interventions (listed above)
- The three complementary reports listed in the next section which can be read as standalone reviews

2.6 Prioritisation

The initial search returned 619 records which were screened for inclusion and prioritised by scoring their relevance to the aim of the RER using titles, abstracts, and/or executive summaries. Records such as systematic reviews or meta-analyses were scored more highly given their increased depth and breadth of insight, compared with single study articles. Full text versions of the top 50 scoring records were examined in detail, and their reference lists were searched for additional relevant records (i.e., snowball approach). Further records identified through other sources and additional targeted searches resulted in a total of 113 records being included in this review, including peer-reviewed journal articles, policy reports, and other documents (e.g., population statistics).

2.7 Limitations

A key limitation of any review of this nature is publication bias. Positive results are more likely to be published than null results which means that many studies in the published literature (including systematic reviews) may be reporting spurious effects.[18]

2.8 Complementary reports

There are three complementary reports to this RER which can be read as standalone reviews and are therefore not comprehensively rehearsed in the main body of this paper.

Report 1: The Commonwealth's National Alcohol Strategy 2019-2028.
https://www.health.gov.au/sites/default/files/documents/2020/11/national-alcohol-strategy-2019-2028.pdf

This document provides a list of "evidence-based and practice-informed approaches to harm minimisation for alcohol" on pages 35-27. The predicted effect size of these approaches and evidence of their impact from rigorous evaluations is not provided.

Report 2: Miller, P., Curtis, A., Chikritzhs, T., & Toumbourou, J. W. (2015). Interventions for reducing alcohol supply, alcohol demand and alcohol-related harm. Canberra, Australia: National Drug Law Enforcement Research Fund (NDLERF).
https://www.aic.gov.au/sites/default/files/2020-05/monograph57.pdf

This document summarises the findings of a literature review and Delphi study on interventions to reduce alcohol supply, alcohol demand, and alcohol-related harm. Effectiveness ratings are given to each intervention based on the rigour of the evaluation design in the literature (represented by 1-3 ticks). Where the intervention is not studied in the literature, its effectiveness rating is based on expert opinion (represented by 1-3 asterisks). The authors conclude: "This study identifies a large number of interventions for the reduction of alcohol-related harm, and the majority of these have very limited evidence bases." Only three interventions received three ticks for the highest standard of evidence. These are:

- Minimum legal purchase age;
- Reducing alcohol outlet opening hours; and
- Alcohol price including excise and taxation.

Report 3: Babor, T. F., Casswell, S., Graham, K., Huckle, T., Livingston, M., Rehm, J., Room, R., Rossow, I., & Sornpaisarn, B. (2022). Alcohol: No Ordinary Commodity-a summary of the third edition. Addiction (Abingdon, England), 117(12), 3024–3036.
https://doi.org/10.1111/add.16003

An earlier edition of this book inspired the Miller paper listed above. The book was last updated in 2023 and therefore provides a more recent overview of the literature in this area. The most relevant chapter of this book to the WA MVP Pilot is Chapter 12 titled "Modifying the drinking context: reducing harm in the licensed drinking environment and other contexts". It concludes that the "effectiveness of interventions will vary by the content of the intervention, how it is implemented, and the cultural context in which the intervention is applied". The most effective intervention (with a moderate effect) is imposing legal liability for drink driving harms on servers, managers, and owners of licensed premises (known as dram shop liability laws in the United States). However, there are only a few well-designed studies on this intervention. The most evidenced intervention (with enough studies for a meta-analysis) is responsible service of alcohol training and policies, but it is not effective.

3 Rapid Evidence Review key findings

Key findings of the RER are presented as follows:

First an overview of evidence for the Cardiff Model is summarised because this is the program from which the WA MVP Pilot was developed. It must be noted that the Cardiff Model did not aim to reduce alcohol-related presentations at ED in general which is one of the aims of the WA MVP Pilot. Rather, the focus of the Cardiff Model was on reducing injuries from violence. In addition, while the Cardiff Model has been demonstrated to be effective, it involves the implementation of multicomponent interventions, and their individual impact cannot easily be unpacked. Therefore, this RER summarises what is known about the effectiveness of the Cardiff Model so that interventions relevant to the WA MVP Pilot can be identified.

The remaining findings of the RER are divided into the following categories:

- Geographically targeted interventions
- Non-regulatory restrictions on alcohol sales
- Community based multicomponent programs
- Training licensed venue staff to reduce violence
- Removing glassware
- Toughened glass
- Design of venues
- Managing the environment outside drinking venues
- Helpers in the environment
- Street lighting
- Generalisable designing out crime strategies
- Information only (education and awareness)
- ID scanners for banning individual patrons
- Hotspot policing

Individual-level interventions

- In hospital interventions
- Cognitive Behavioural Therapy
- Restorative justice conference
- Sobriety tags

3.1 The Cardiff Model for violence prevention

The Cardiff Model is a targeted policing approach that was originated by Maxillofacial surgeon Jonathan Shepherd in Cardiff, UK. He noted that hospital staff were often party to key insights regarding the assaults they dealt with. For example, certain pubs were associated with a larger number of assaults than others, violence was greater when a strike was in progress, and ED doctors saw significantly more assaults than were reported to police.

Shepherd proposed a partnership between ED staff and local police, where ED staff would ask assault victims about the location of the assault. This information in aggregate would allow the police to identify crime hotspots and adjust their resource allocation and beat to target these hotspots. The model was tested in Cardiff over a period of 7 years. During the study period, violence-related hospital admissions declined from approximately 7 to 5 per month per 100,000 population compared with an increase from 5 to 8 per 100,000 populating in comparison cities, a relative reduction of 42%. The original study also revealed and mapped gang violence locations in the city that had been previously unknown to police.

The Cardiff Model has since been applied worldwide with success. An RCT in Milwaukee, USA, showed that data sharing between healthcare services and police was associated with a reduction in homicide where homicide data were shared with police. Mean homicide counts in the Cardiff Model condition decreased by 1.13 homicides per month, while the homicide rate in control districts increased by 0.31 homicides per month.

3.2 Cardiff Model interventions

A review of eight studies on the Cardiff Model found the interventions were reasonably similar across study sites and time periods and heavily focused on law enforcement.[22] The most consistent intervention was covert and high visibility policing at venues identified as high risk for violence (fast-food outlets and night clubs). Some studies also increased policing of all licensed venues and targeted alcohol licensing enforcement, e.g., selling alcohol to intoxicated customers.

One study sent ED staff[3] to the two highest risk venues in the area to detail the harm occurring on premises to venue managers.[23] A recent Australian study similarly sent quarterly letters to the top five venues reported within the ED, outlining the number of attendances related to their business, anonymised details of the cases including diagnoses, and anonymised photographs of injuries. Letters were delivered via the Australasian College for Emergency Medicine (ACEM) to registered licensees.[24] The authors of these studies suggest that the mechanisms of change for these interventions appear to be increasing venue managers' perception of surveillance and increasing their sense of responsibility for patron injuries and fear of public shaming. This leads them to change their practices in ways that prevent alcohol-related ED presentations.

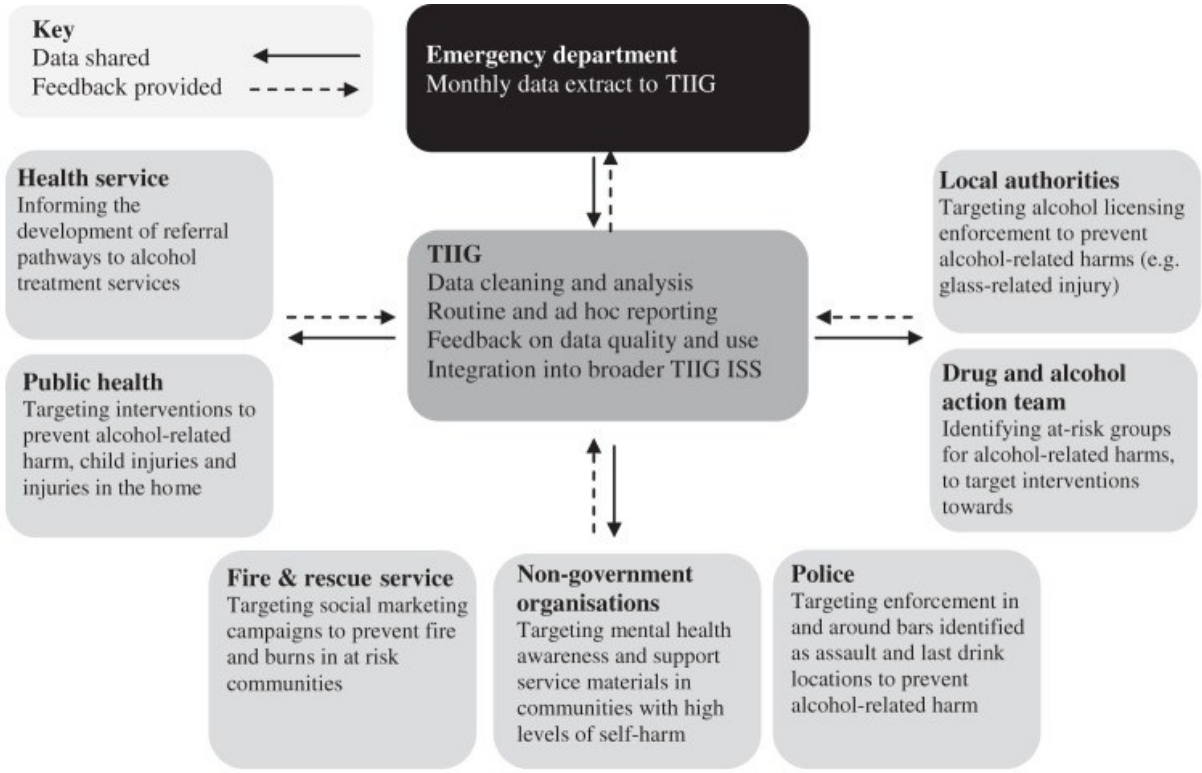
[3] Two consultants (ED and maxillofacial) visited these premises and presented in graphic detail the injuries sustained, treatment, and numbers of assaults there to premises managers. They also informed the managers that the ED was auditing violence in their premises and that a report would be published six months later and disclosed to the local media.

Other interventions incorporated in Cardiff Model studies[25] have included:

- Pedestrianising certain nightlife sections of the city when it became apparent that violent incidents were triggered by restricting thousands of intoxicated, hungry people to a narrow pavement when they were trying to get home from a licensed venue
- Traffic and parking management outside high-risk venues to convey patrons away from the site on closure
- Introducing mandatory plastic container restrictions in some venues (to reduce weapon availability from glasses and glass bottles)
- Increased availability of late night transport (buses) to permit faster dispersal of patrons from licensed venues at closing time and thereby reducing the likelihood of assault
- Increased media attention on the locations of violence
- An assault awareness campaign in schools and public libraries
- Increased allocation of crime prevention resources by all agencies
- Deployment of CCTV systems at street location hotspots for violence
- Concentration of police (overt and covert) at street location hotspots for violence
- Limiting alcohol availability (changes in alcohol licensing, restricting opening hours, and cancelling the licenses of some premises)
- Protecting those injured by domestic violence from repeat harm, such as through refuge accommodation where necessary

Cardiff Model studies do not attribute reductions in violence to specific prevention strategies. Instead, they identify the impact of data sharing and multi-agency allocation of resources towards violence and alcohol-related harm reduction. For example, Quigg et al (2012) found reductions in violence over a 6-year study period of implementing a wide range of prevention strategies (Figure 1 below). Intentional injury presentations to the ED decreased by 35.6% and unintentional injuries by 11.5%.[26]

Figure 1. Interventions tested in one Cardiff Model study



Source: Quigg, Z., Hughes, K., & Bellis, M. A. (2012). Data sharing for prevention: a case study in the development of a comprehensive emergency department injury surveillance system and its use in preventing violence and alcohol-related harms. Injury Prevention, 18(5), 315-320.

Another Cardiff Model study found that four years after implementation, there was a 42% reduction in violence causing wounding recorded by police (and a reduction in hospital admissions related to violence) but an increase in police recording of minor assaults.[27] The authors suggest that the mechanism of change for interventions involving increased policing of alcohol consumers is faster and more frequent police intervention in assaults and their precursors (such as arguments), which in turn leads to greater reporting of common assaults but limits the severity of injury.

There is limited evidence on the use of Cardiff Model data sharing to target domestic and family violence and alcohol-related injuries in the home. However, a recent Australian study found most alcohol-related ED presentations were associated with packaged liquor and drinking at home.[24]

Key recommendations from Cardiff Model studies overall are:

- Interventions focusing on licensed premises should be bolstered by robust prevention efforts in the surrounding streets to mitigate the risk of violence displacement.
- To improve the consistency of ED data collection (which in turn improves the targeting of prevention strategies), give staff feedback on their work in the form of crime reports.
- Analysis of effectiveness should account for fluctuations in population levels and shifts in venue capacity as venues with higher patron capacity are at greater risk of violence.

- If rates of woundings recorded by the police fall significantly because of more accurate targeting of hotspots and earlier and more frequent police intervention in assaults and their precursors, there may be a concurrent increase in common assaults recorded by the police (that is, those not resulting in injuries).

Box 1. Findings on the displacement of violence

One study which implemented the police interventions listed below found they had no impact on violence in venues but led to displacement of increased violence on one particular street.[23]

Description of low and high-level police interventions

Low level police intervention:

- Contact established with licensed premise management by "Tackling Alcohol-Related Street Crime" (TASC) project manager—regular telephone calls.
- Licensed premise managers given outline/reminder of TASC project objectives.
- Regular monitoring of venue.
- Training of designated TASC door staff officers briefed to visit premises. Arrangements made for information on door staff to be regularly checked against Licensed Premise Supervisor Register.
- Ongoing visits by local community constable (as deemed necessary).

High level police intervention (performed in addition to low level measures):

- Redeployment of local sector police to an unauthorised fast food outlet at the premises car park.
- Traffic management plan of site instituted to assist in conveyance of patrons away from site on closure.
- Proactive CCTV instruction from TASC inspector to police camera room.
- One-day covert operation—10 officers, a traffic vehicle, and a drugs dog*, in conjunction with premises door staff. Those entering the club were searched, and the dog patrolled the entry queue. Plain clothes officers followed those avoiding search to their cars. Traffic police caught those attempting to drive away.
- Eight week high profile, high visibility policing program along two roads identified as trouble hotspots for patrons through ED and police data.
- New car park configuration and access arrangements around venue agreed with the site owners and implemented.

*Police assumed that illicit drug carrying patrons would contribute disproportionately to violence.

Finally, the history of the Cardiff Model and a comprehensive summary of Cardiff Model studies is provided by Cardiff University's Violence Research Group, led by Jonathan Shepherd, here https://www.cardiff.ac.uk/documents/2665796-the-cardiff-model-for-violence-prevention

The authors note that some of the interventions that have been tried by Jonathan Shepherd's group over the decades proved ineffective and were discontinued. However, many interventions "*did work, grounded in the evidence-based principles that, for example, limiting alcohol availability, targeted policing and reducing weapon availability (in this case of glasses and glass bottles) are effective. Rather than displace violence, targeted police activity has been found to create a halo of prevention around targeted locations. Effective interventions flowing from the Violence Research Group's knowledge, observations and evaluations also included CCTV camera installation to cover previously hidden violence hotspots. South Wales Police operations targeted fast-food outlets and night clubs identified as violence locations and included deployment of drug detection dogs among queues of people seeking nightclub access. This last strategy was prompted by the group's research findings that antisocial lifestyles comprise not only violence but also drug misuse, truanting, car crime and a range of other behaviours harmful to health.*"

The Cardiff Model studies reviewed in this section highlight that the WA MVP Pilot working group will need to (a) complement enhanced police enforcement with locally designed interventions suited to the context in collaboration with stakeholders, and (b) be open to some of these interventions not working. However, through strong stakeholder partnerships and ongoing data sharing it should be possible to learn and adapt approaches to see meaningful changes in violence outcomes over time. The impact of Cardiff Model interventions on risky drinking is, however, unknown as most studies have evaluated impact by measuring violence causing wounding / death recorded by police or a reduction in hospital admissions related to violent injury.

The next section presents the evidence on interventions to reduce risky drinking, reduce violence, or reduce injury.

Table 2. Evidence on geographically targeted and individual-level interventions to reduce drinking, violence or injury.

Intervention type	Target behaviour	Evidence rating
Geographically targeted interventions		
Non-regulatory restrictions on alcohol sales	Risky drinking	?
Community based multicomponent programs	Risky drinking, violence, injury	++
Training licensed venue staff to reduce violence	Violence	+
Removing glassware	Injury	+
Toughened glass	Injury	?
Design of venues	Risky drinking, violence, injury	?
Managing the environment outside drinking venues	Violence	++
Helpers in the environment	Violence, injury	?
Street lighting	Violence, injury	+
Generalisable designing out crime strategies	Violence	?
Information only (education and awareness)	Risky drinking, violence, injury	?
ID scanners for banning individual patrons	Violence, injury	?
Hotspot policing	Violence, injury	++
Individual-level interventions		
In hospital interventions	Risky drinking, violence, injury	++
Cognitive Behavioural Therapy	Risky drinking, violence, injury	+
Restorative justice conference	Violence	++
Sobriety tags	Risky drinking	-

Strong evidence of effectiveness (+++); Quite strong evidence of effectiveness (++); Promising evidence of effectiveness (+); Ineffective (-); Limited evidence (?)

3.3 Geographically targeted interventions

3.3.1 Non-regulatory restrictions on alcohol sales

Target behaviour: Risky drinking

Evidence quality rating: Limited evidence

Alcohol sales can be restricted in a number of ways. The first four interventions listed below do not require regulatory or policy changes if they are implemented by businesses themselves on a voluntary basis. The fifth could be considered in the context of government agencies issuing future alcohol license applications so as to not impact existing businesses.

1. Ceasing the sale of high-alcohol drinks ('shots') after a certain time
2. Ceasing cheap drinks promotions such as happy hour
3. Reducing licensed venue trading hours
4. Reducing trading hours for take-away liquor
5. Reducing the density of outlets selling liquor in a given area

As discussed below, these approaches appear to have modest impacts on reducing alcohol-related harms but the quality of evidence supporting them is limited. In addition, as regulatory and policy interventions are out of scope for the WA MVP Pilot, implementation of these approaches would require voluntary agreement from businesses.

There is evidence from the UK that businesses can be willing to remove high strength alcohol products to reduce alcohol-related crime.[28] An evaluation of such a voluntary agreement in Manchester found it was associated with greater reductions in alcohol-related crime and antisocial behaviour relative to areas that continued to sell high-strength alcohol over the course of a year.[29] However, other evidence suggests that voluntary agreements with venues can result in low fidelity of intervention implementation if participation conflicts with the venue's culture or appears to be financially disadvantageous.[30]

1. Ceasing the sale of high-alcohol drinks ('shots') after a certain time

Banning high-alcohol drinks ('shots') after a certain time has been implemented in QLD to reduce alcohol-related violence. An analysis designed to separate the impact of this intervention from others implemented at the same time found no evidence that banning high-alcohol drinks independently reduced police-recorded assaults.[31] However, there is a lack of evidence to know if licensed venues voluntarily seeking to reduce risky drinking through certain sales restrictions is more effective.

2. Ceasing cheap drinks promotions such as happy hour

The existence of cheap drinks promotions has been associated with alcohol-related violence and harm.[32] A 2020 systematic review of drinks specials found only one study which looked at the impact of prohibiting happy hours and found mixed findings.[33] However, a voluntary approach may be more effective than a ban because it would suggest the venue is committed to the responsible service of alcohol, but this has not been rigorously evaluated.

3. Reducing venue trading hours when alcoholic beverages can be sold

Studies that have reviewed the effectiveness of restricting the hours during which alcoholic beverages can be sold have found some evidence to support this type of policy. A 2010 study examined extended opening hours of licensed premises across 10 studies conducted worldwide. It found that increasing hours of sales by 2 hours or more increased alcohol-related harm.[34] Another meta-analysis focusing on the hours and days of sale and the density of alcohol outlets, covering 44 studies conducted between 2000 and 2008, found that restrictions on availability can be effective in reducing alcohol-related harm. However, it is unclear what the impact of a voluntary reduction in trading hours would be and whether this would be feasible.[35]

Evaluations of multicomponent interventions to reduce alcohol accessibility in Sydney and Newcastle found reduced trading hours (not liquor restrictions such as banning shots after a certain time of night) was the driver of an observed reduction in non-domestic assaults, and domestic and family violence.[36] However, there may have been displacement of drinking to other areas. A Queensland study of a similar intervention across multiple entertainment precincts found some areas saw reductions in non-domestic assaults similar to the effect sizes in Sydney and Newcastle, but other areas saw no significant impact. The researchers conclude the inconsistent effects appear to be due to patrons in some areas not having nearby alternative entertainment precincts with later trading hours that they can attend, or a general downward trend in non-domestic alcohol-related violence.[37]

4. Reducing trading hours for take-away liquor

There is less research literature examining the impact of changing trading hours for takeaway liquor sales. Two studies from Europe provide some evidence that reducing availability of packaged liquor late at night can reduce alcohol hospital admissions for young people. These were a Swiss study of the combined effect of reducing outlet numbers and trading hours and a German study of a ban on takeaway alcohol sales between 10pm and 5am.[38] Therefore, the individual effect of reducing trading hours for take-away liquor lacks a strong evidence base.

5. Reducing the density of outlets selling liquor in a given area

Reducing the density of outlets selling liquor in a given area has strong supporting evidence associated with reduced harm. For example, it is listed as a "proven strategy" to prevent excessive alcohol use by the US Centers For Disease Control and Prevention.[39] A Queensland study found a positive relationship between outlet density and assaults was stronger in precincts with trading hours ending at 5am compared to 3am (IRR = 1.01, p = 0.03).[40]

In the context of the WA MVP Pilot, reducing outlet density is out of scope. However, this approach could be applied to reducing the growth of outlet density, so that outlet density per capita reduces over time as the population increases. A key limitation of this approach is that the impact on risky drinking, violence and injury may take a long time to be observed.

3.3.2 Community based multicomponent programs

Target behaviour: Risky drinking, violence, and injury

Evidence quality rating: Quite strong evidence

Community based multicomponent programs can affect the way venues are managed and servers behave. They typically comprise four elements: convening a multiagency steering group (e.g., public health, local government and police) and community awareness raising about the initiative; responsible beverage service training; routine patrols (e.g., weekly visits to licensed premises); and enhanced enforcement (e.g., visits to venues of concern informing them that their alcohol sales to intoxicated patrons were being actively monitored via unscheduled or under cover visits).

Though there are methodological issues with many of the studies that have been done in this area,[41] there is strong evidence of the potential effectiveness of multicomponent programs from a well-designed study in Sweden. The Sweden study was a natural experiment that drew on variation in the implementation of the program across 290 municipalities over 13 years (1996-2009). It found a statistically significant reduction in police recorded assaults, which translated as a 39 EUR return for every 1 EUR spent on the program.[42]

A smaller scale study in the UK sought to establish the effect of a community based multicomponent program on sales to intoxicated patrons. It found that venues which had been part of the program were between two and four times more likely to refuse the sale of alcohol to intoxicated patrons, with stronger effects seen when all four elements of the program were delivered (especially the enhanced law enforcement).[43]

The specific components of community-based programs determine their impact and the specific harm reduction outcomes that can be achieved. However, rigorous evidence on the effectiveness of isolating specific components of these programs is lacking. A review of eight community-based interventions to reduce alcohol consumption and alcohol-related harms found the six that were effective included community mobilisation, responsible beverage service, restrictions on alcohol, and tailored education programs.[44] By comparison, local liquor accords across four sites in Geelong, Victoria, which included high visibility and undercover policing, celebrities endorsing safe drinking, ID scanners and a radio program to keep security staff connected to authorities, showed no impact on alcohol-related ED presentations or police attended assault rates.[45]

Community based multicomponent programs have similar intervention approaches to Cardiff Model studies and therefore could be enhanced with Cardiff Model data to target venues of concern. Another way to increase the impact of community-based multicomponent programs is by improving the collection of timely alcohol sales data (including from bars, pubs, casinos and bottle shops) to identity high-risk businesses for pre-drinking and excessive alcohol consumption.[46] These businesses could be targeted for inclusion in community-based prevention programs and more closely monitored for alcohol-related incidents. This would complement patient data collection in ED on the location of violent incidents and source of alcohol as part of the WA MVP Pilot. The data could also be supplemented by police asking those involved in violence where they obtained their last drink, as is done in NSW.

3.3.3 Training licensed venue staff to reduce violence

Target behaviour: Violence

Evidence quality rating: Promising evidence

While responsible service of alcohol training has been found to be ineffective without strong enforcement because venues have an incentive to profit from alcohol sales, this conflict of interest doesn't exist for training bar staff to prevent violence.[10]

Studies have shown that server behaviour and the way venues are managed have associations with alcohol-related violence.[32] For example, aggressive bouncers have been found to be an exacerbating factor in the occurrence of violence in entertainment districts.[47]

There is some evidence in support of programs that train bar staff to reduce disorder, although there is a lack of evidence to support their use to reduce intoxication.[48] In the USA and in Australia, interventions involving police-led training for bar staff in how to identify and respond to potential problems and when to involve police have been found to be effective.[49]

The Safer Bars program trains staff and owners/managers to prevent aggression in licensed premises and work as a team to resolve problematic situations. It also requires owners/managers to complete a risk assessment to identify ways of reducing environmental risks of aggression. The program was evaluated in Canada with a RCT and produced a small positive effect. Moderate (e.g., shoving, grappling) to severe (e.g., punching, kicking) physical aggression by patrons decreased from 11.5 percent pre-intervention to 8.3 percent postintervention compared to a 5.1 percent increase in control bars ($t(28)=2.28$, $p<0.031$). The program has been adapted in the USA to train bar staff in sexual violence prevention in order to reduce rates of alcohol-related sexual assault. The study protocol has been published but the results are not yet available.[50]

Current implementation of a licensed venue staff training intervention:

The Licensing security and vulnerability initiative in the UK is an online self-assessment tool for licensed premises, focusing on legal requirements and good practice to reduce alcohol-related crime by helping venues to recognise and implement good practice. The self-assessment is sent to licensing authorities within the police, who can provide an accreditation based on the assessment, which is renewed every 12 months. The tool provides advice about crime prevention, including staff training, boiler plate management policies (e.g., around dispersal of customers and crime scene preservation) and recommendations to deter drug use. It is being implemented by the UK Police Crime Prevention Initiative and an evaluation began in 2023 with results not yet available.[51]

3.3.4 Removing glassware

Target behaviour: Injury

Evidence quality rating: Promising evidence

Pub glassware and bottles have been identified as a common weapon, most often used opportunistically in instances of violence.[52] A study of eight nightclubs in Glasgow, UK, where glass barware was substituted with plastic containers demonstrated lower injury risk when violence occurred (as observed during 100 hours of observation time by the authors of the study). Patrons surveyed also reported greater feeling of safety in these venues.[53] It should be noted that this study was small scale and limited in data sampling to the observations of its authors and the self-reported, incentivised responses of patrons selected by the authors. Several Cardiff Model studies have also removed glasses and glass bottles from venues and Jonathan Shepherd's research group believes it to be effective based (see earlier section on the Cardiff Model).

3.3.5 Toughened glass

Target behaviour: Injury

Evidence quality rating: Limited evidence

Since broken glass has caused many injuries in night time drinking environments,[54] a rational response is to replace it with glassware that is harder to break. However, this review was not able to find any empirical evidence that definitively supported this perspective. The reasons for this are twofold: the relatively small number of injuries caused (meaning that experimental evidence would require a large sample of bars, over a long period of time, to detect a statistically significant reduction in injuries); and the mixed standards of toughened glassware products that are available.

Polycarbonate 'glassware' (PCG) is virtually unbreakable. It is a plastic that has been developed to look and feel like glass. A 2009 evaluation of polycarbonate glass assessed its impact across 22 venues in Lancashire, UK. It should be noted that the researchers did not use random assignment in the design of this evaluation. They collected data on the number of glass related injuries, number of broken bottles and glasses, sales, and ED attendance. They also conducted observational research and customer and staff surveys. They found a decrease in glass related injuries and breakages in venues using PCG, and an unanimously positive readout from managers and licensees that PCG was safer. However, there was no statistically significant difference in ED attendance.[55]

A 2000 RCT of 57 bars in the UK (South Wales, West Midlands, and West of England)found that the substitution of regular glass with toughened glass in pints did not lead to fewer injuries, though many publicans surveyed agreed with the hypothesis that toughened glass would lead to fewer injuries.[56] In the trial, the toughened glass group (treatment arm) suffered a higher proportion of injuries than the ordinary glass group (the control) because the toughened glass was in fact less impact resistant than the ordinary glass.

3.3.6 Design of venues

Target behaviour: Risky drinking, violence and injury

Evidence quality rating: Limited evidence

Correlational studies have suggested that venue factors such as overcrowding, poor physical layout (e.g., poorly designed choke points, poor ventilation, insufficient seating, over-heating, dim lighting, positioning of pool tables and games in relation to customer in and out flows) and theme (e.g., type of music played) are associated with alcohol-related violence.[57,58] However, this review found no evidence suggesting that an intervention which alters the physical design and theme of venues could reduce alcohol-related violence. While correlations provide insight into possible risk factors for alcohol-related violence, they cannot determine causality and therefore may not predict the effectiveness of related interventions.

An example of correlational evidence in this area is venue capacity. One study analysed 5,729 venue-years (yearly assault counts per venue, per year) across central Melbourne. Venues with maximum capacities between 501 and 1,000 were 6.1 times more likely to have an assault recorded compared to venues with a maximum capacity between 0 and 100.[59] Similarly, one Cardiff Model study suggested that violence was associated with larger venues.[23] Small bars have also been associated with perceptions of safety.[60] Despite the apparent relationship between venue capacity and violence, no rigorous studies could be found to demonstrate that interventions to reduce venue capacity reduces alcohol-related violence.

A pilot by the City of Sydney generated suggestive evidence that live music might reduce alcohol consumption compared to other venues. Due to data limitations, no conclusive findings could be made regarding the impact of live music on alcohol consumption. However, the pilot study found lower rates of alcohol consumption during live music events compared to non-live music events, and on the night of a live music performance, lower rates of alcohol were consumed during the performance than before, after and between sets. The researchers conclude that "Principally, the study provides useful guidance for future research and insight into audience perceptions and motivations".[61]

3.3.7 Managing the environment outside drinking venues

Target behaviour: Violence

Evidence quality rating: Quite strong evidence

Large group sizes and the presence of intoxicated people are two situational factors that increase the likeliness of violence. This may occur if patrons hang around outside venues at closing or if there are cluster points on the routes patrons take to get home such as narrow sections of pavement or taxi ranks.

Police have used creative ways to disperse crowds as quickly as possible. The Chicago Police Department has successfully used horse-mounted police to lead crowds away from stadia after sporting events and toward key transport locations, using nearby arrest vans to remove very drunk people from the immediate environment and give them a safe space in which to sober up.[62]

A survey of police managers in the USA found that ensuring the swift removal of intoxicated people from crowds in entertainment districts to rest areas, controlling the flow of pedestrian traffic leaving sports venues using police horses and playing 'muzak'- style music at low levels in car parks can reduce the likelihood of crowds lingering and, therefore the likelihood of problems developing. Pedestrianising entertainment districts, whether permanently or temporarily, has been found to be moderately effective in reducing the likelihood of aggression and confrontation between pubgoers and drivers.[62,63]

There is strong evidence to support a reduction in violence from increased targeted police presence[64], as summarised in an earlier section on the Cardiff Model. Additional police training in crisis management and mental health has been found to lead to increased appropriate referrals to mental health professionals and to decreased rates of arrest.[65]

3.3.8 Helpers in the environment

Target behaviour: Violence and injury

Evidence quality rating: Limited evidence

Individuals in the drinking environment can take a formal or informal role in reducing violence associated with risky drinking.

In Australia, community patrols led by First Nations Australians, mostly women and elders, support police through their own responses. These patrols operate in areas where many First Nations people live and have been found to help diffuse situations and assist people who consume alcohol to access treatment programs.[66]

The concept of 'capable guardians' – either mental health clinicians or members of the clergy accompanying police when managing alcohol-related incidents – has been well established in criminological theory, though evidence as to their effectiveness is limited.[65] 'Street Pastors' is a program in the UK to support people at risk of victimisation in the nighttime economy. Though there are strong perceptions of them increasing safety, evidence linking them to a reduction in crime or violence is lacking.[67]

An evaluation of a Sydney program called the 'Take Kare Safe Space' initiative which provides somewhere where young people who are out for the night can rest their feet, get rehydrated, charge their phones, get first aid, find transport home or wait for friends found a lack of evidence to show it had a meaningful effect on the pattern of alcohol-related assaults, alcohol-related ED presentations and alcohol-related ambulance dispatches.[68]

Peer support and social group responsibility interventions are relatively new and have the goal of decreasing alcohol consumption, unsafe behaviours such as drink driving, and interpersonal violence. They involve short educational interventions that encourage a group of young people to keep each other safe. There are few rigorous evaluations, but these interventions may improve safety outcomes without impacting alcohol consumption. For example, the SafeNights program in the US involved researchers intercepting groups of young people travelling to Mexico for a night out with strategies to plan for staying safe. A RCT (n=1,048) found the intervention reduced rates of female victimisation. However, it did not reduce alcohol use, and the level of participants' alcohol use did not affect victimisation rates.[69]

There is limited evidence on whether assault outcomes are impacted by bystander interventions or assisting bar-goers to leave high density venues safely by providing transport support. However, these interventions may be useful as part of multicomponent initiatives.[70]

Current implementation of a helper in the environment intervention:

In the UK, the Safer Nights Out van is an overt mobile asset funded by the Northamptonshire Police, Fire and Crime Commissioner and staffed by volunteers. The idea behind the van is to bridge the gap between door staff and the emergency services, and between vulnerable people and emergency services, specifically during the period between vulnerable people leaving venues and the police being called to an alcohol-related incident. This includes getting vulnerable people home or to a place of safety. The van is deployed in the same location every Friday and Saturday evening, when nighttime economy footfall is at its highest. The approach is said to identify vulnerability early on, particularly of women. An evaluation is currently ongoing.[71]

3.3.9 Street lighting

Target behaviour: Violence and injury

Evidence quality rating: Promising evidence

Improved street lighting is a form of situational crime prevention. Increasing the levels of light in public spaces and streets serves a variety of purposes, including accident prevention, but has been shown to reduce violent crime by 21% (drawn from a review of 13 studies in the UK and the USA). The mechanism by which it works is primarily the sense of increased natural surveillance provided by the illumination, but it could also increase a sense of community pride in a local area. If the latter, it is likely that it will be more effective in underinvested communities.[72]

It should be noted that this review could not find evaluation evidence detailing the impact of street lighting specifically on alcohol-related offences. However, given the very strong evidence for street lighting reducing crime in general, it is a promising approach.

3.3.10 Generalisable designing out crime strategies

Target behaviour: Violence

Evidence quality rating: Limited evidence

Designing out crime is an approach that requires a strong understanding of the specific context in which crime is occurring so that a tailored approach can be developed to alter the environment in such a way that the crime is less likely to occur. Because strategies are not generalisable to different contexts and require local knowledge to be effective (i.e. down to details about individual venues), there are evaluation challenges which limit the generation of rigorous evidence that this approach can reduce alcohol-related violence. The previously held "generalised" principle that crime would be reduced by creating a clean and ordered urban environment (the broken windows theory) has been debunked.[73,74]

One way designing out crime could be included in the WA MVP Pilot is by incentivising businesses to develop intervention ideas that suit their venues and to pilot them themselves.

3.3.11 Information only (education and awareness)

Target behaviour: Risky drinking, violence and injury

Evidence quality rating: Limited evidence

There is limited evidence to suggest that largescale awareness and education campaigns about the dangers of alcohol are effective at reducing alcohol-related violence. Information-based interventions have been successful at increasing awareness of the dangers of alcohol and its relationship with violence,[75] as well as increasing referrals to treatment and affecting self-reported attitudes towards drinking. However, no high-quality evidence exists to show that it can consistently reduce harm or even alcohol consumption.[76]

In one 2017 meta-analysis of mass media campaigns to reduce alcohol consumption and harm, only two studies were able to find associations with reduced alcohol consumption.[77] In fact, experimental evidence suggests that, if not carefully designed, responsible drinking messages can increase consumption.[78] A 2017 study assessing the effectiveness of health messages about drinking for young people specifically found results that can at best be described as mixed, with no impact on self-reported intention to drink and backfiring effects on attitudes towards drunkenness when exposure to the messaging was passive (which is the closest condition to reality, as we don't tend to actively concentrate on marketing material we happen to see).[79]

While product labelling is not within the remit of state/territory governments, some researchers have suggested that signage with guidelines on low-risk drinking could be placed within 2 metres of all points of sale to reduce risky consumption.[46] Evidence on product labelling can inform the likely effectiveness of such a measure, with the caveat that these studies are usually lab-based or rely on self-reported data, which limits their ability to return real world results.

A 2022 meta-analysis found that studies on calorie labels for alcoholic drinks show both increases and decreases in consumption (as measured by self-reported, intention to purchase scores). Evidence from unit labels and 'alcohol by volume' (ABV) labels was similarly mixed.[46] A 2021 meta-analysis also showed a mixed picture[80] and underscored that, although positive effects were measured on self-reported outcomes like recall and comprehension, the effectiveness of these labels needs further research among population groups whose risk perception of alcohol-related harm is low.

One reason for this mixed picture is that awareness of harm is often identified as a useful mechanism for reducing or mitigating harmful alcohol-related behaviours. But, though seemingly rational, evidence suggests the relationship between awareness of harm and harmful behaviours is not straightforward. In an Australian study,[75] many young festival goers reported risky alcohol consumption, despite reporting a good understanding of the safe number of drinks protecting them from long-term harm and injury, yet the opposite was true in a study from Switzerland (lower levels of harmful behaviours matched with lower levels of harm awareness).[81]

There is more promise for targeted information-based interventions. In a meta-analysis focused on the prevention of drug and alcohol use among young people, interventions designed to recalibrate young people's sense of drinking norms were found to have a small, positive short-term effect on alcohol consumption, including the reduction of 1.5 drinks per week among heavy episodic drinkers.[81] A real-world RCT in the US and Mexico, where drinkers were exposed to social norm messages before a night out and then breathalysed on their return, showed directionally positive but statistically insignificant results on alcohol consumption but positive impact on norm perception.[82]

The 'Brief Alcohol Screening and Intervention of College Students' (BASICS) is aimed at university students 18-24 years old who drink alcohol heavily and have experienced or are at risk for alcohol-related problems such as poor class attendance, missed assignments, accidents, sexual assault, and violence. The intervention aims to motivate students to reduce risky behaviours instead of targeting a specific drinking goal such as abstinence or reduced drinking. Students complete a questionnaire about their alcohol consumption and participate in two 50-minute interviews spaced two weeks apart. They receive personalised feedback about their patterns of drinking compared to other students the same age and gender, thereby shifting norm perceptions, and suggested ways to reduce future risks associated with alcohol use. A randomised evaluation found that while the intervention didn't reduce the frequency of drinking, it showed statistically significant reductions on measures of negative consequences related to drinking, compared with the control group at the 4-year follow up.[83]

3.3.12 ID scanners for banning individual patrons

Target behaviour: Violence and injury

Evidence quality rating: Limited evidence

There is limited rigorous evidence on the impact of patron ID scanners which collect licensed venue attendance data. ID scanners are thought to act as a deterrent measure, but also complement the use of patron bans by allowing for the detection of those that have been banned from local venues.

A study in the Victorian regional city of Geelong found little connection between the coordinated introduction of ID scanners and reduced levels of alcohol-related assault in the Geelong night-time economy.[84] This may be because patron bans do not appear to reduce alcohol-related violence. A Queensland study found the number of police-issued 10-day patron bans did not significantly predict changes in serious assault, common assault or good order offence trends the weekend following the ban (within the 10-day period).[85] However, a separate Queensland study found suggestive evidence that ID scanners may be associated with reductions in serious violence and concluded the impact may depend on the length (and enforcement) of patron bans used.[86]

3.3.13 Hotspot policing

Target behaviour: Violence and injury

Evidence quality rating: Quite strong evidence

As discussed with regards to the Cardiff Model, the importance of accurate targeting data to crime prevention cannot be overstated. The proven exercise of policing crime hotspots based on past crime data has also proven effective. A 2019 study examining the effectiveness of targeted policing in high-crime geographic areas found a significant reduction in overall crime (including drug and alcohol offences) compared with control areas which had regular police presence. Additionally, the crime-reduction benefits diffused beyond the targeted hotspots into surrounding areas.[87]

Sizes of hotspots vary depending on location, the distribution of crimes and the nature of the terrain. Dr Geoffrey Barnes, a renowned expert in the design of policing hotspots who was consulted for this RER, proposes the size of a hotspot should be an area that can be entirely surveyed by a single officer. He says this is generally around 200m by 200m but can vary depending on the design of the surrounding streets. To this end, hot spot policing works best in US style 'grid cities'. Older cities, like London, are more likely to have more street bends and corners that cannot be seen around.

This review did not find evidence to suggest that displacement of crime happens during a policing hotspot operation. This said, displacement can be hard to measure as it is hard to identify where it might displace to. For example, if the hotspot is in an out-of-town retail area, the offenders of the crime will have nowhere in the immediate geographic area to displace to, but perhaps offenders will go somewhere completely different to offend. Another consideration for researchers is temporal displacement (if hotspots are identified and policed on a given night, the crime may have displaced to the previous night).

3.4 Individual-level interventions

3.4.1 In hospital interventions

Target behaviour: Risky drinking, violence, and injury

Evidence quality rating: Quite strong evidence

An alternative or additional strategy to targeting hotspots for alcohol-related violence involves targeting people at high risk of repeat offending (from police data) or repeat victimisation (from hospital data). However, this requires individual-level intervention implementation.

Intervening in a hospital setting is theorised to be a teachable moment which may increase an individual's motivation to change. Hospital-based interventions have been tested to reduce risky drinking, violence, and injury and found to be effective on these outcomes to varying degrees.

Hospital-based interventions can be divided into two categories: light touch / brief interventions, and longer-term case management (which may include family members). The methods of intervention themselves include a broad range of approaches, including reviewing why and

how an incident happened, motivational interviewing to improve self-efficacy to change, watching a video about violence, meeting with a survivor of extreme violence, patient drinking assessments, and referral to employment services.[88]

A 2014 RCT evaluated the effect of a light touch intervention which aimed to reduce risky drinking. Young adult ED patients who screened positive for past hazardous alcohol use were sent mobile phone text messages after they were discharged from hospital. The messages were sent twice a week for 12 weeks. They asked questions about the patient's alcohol consumption and either provided feedback or did not provide feedback, depending on the treatment arm to which the patient was randomly assigned. The assessment of alcohol consumption plus feedback led to fewer binge drinking days after 12 weeks and fewer drinks per drinking day relative to both the control and the assessment only arm, which was ineffective across all measures.[89] It should be noted that this trial relied entirely on the honesty of the participants reporting their drinking behaviour.

Brice and Boyle (2020) examined a range of violence outcomes in a systematic review of 10 RCTs of hospital-based interventions. The interventions varied in intensity and length but all targeted ED patients, predominantly youth 24-year-olds and under. Most studies enrolled patients that had been injured by participation in violence as they are at high risk of recurring involvement in violence. Of the 10 RCTs included in the review, eight reported statistically significant effects on one or more outcome variables such as attitude change (75%), service utilisation (66.7%), behaviour considered high risk for violence (50%), violent repeat victimisation (33.3%), and violent arrest (33.3%).[88]

Gaffney, H., Jolliffe, D., & White, H. (2021) selected two RCTs included in Brice and Boyle's systematic review for a meta-analysis. They selected these RCTs because they reported on offending outcomes (i.e., arrests, arrests for violence, incarceration, incarceration for violence, and convictions) rather than attitudes. The authors acknowledged the limited sample size but concluded that, on average, ED programs reduce crime and violence by 38%.[90]

Heterogeneity in the intervention designs, populations, and outcome measures of hospital-based intervention studies can explain their varied results. In addition, research shows that how individuals respond to these interventions may depend on the injuries they sustained because of their alcohol use.[91] Exactly why certain interventions will work better in some cases, and for some outcomes, requires assessment of the mechanisms of change which is currently lacking from these evaluations.

Current implementation of an in hospital intervention:

Implementation of a hospital-based intervention is currently underway in South Yorkshire, UK. Emergency Department Navigators provide support to patients who enter ED with a violence-related injury. They are non-clinical staff, usually from community worker backgrounds, who provide a point of contact to victims that is separate from the police and medical services. They are not required to report crimes (except in certain circumstances). Their roles are to intervene at a teachable moment and encourage people to change their behaviour. They can also refer people to statutory and non-statutory support services. A practice report is available to support further testing.[92]

3.4.2 Cognitive Behavioural Therapy

Target behaviour: Risky drinking, violence, and injury

Evidence quality rating: Promising evidence

Another individual-level intervention that has been evaluated to reduce risky drinking, violence, and injury is Cognitive Behavioural Therapy (CBT).

CBT has been shown to provide people with effective tools for managing issues related to alcohol and other drugs. A systemic review found CBT produced small to moderate effects on substance use when compared to inactive treatment and was most effective at early follow-up (1–6 months post-treatment) compared to late follow-up (8+ months post-treatment).[93]

Another application of CBT is anger management. The association between anger and offending behaviour is not well understood at present but various psychological studies have begun to bring nuance to this topic. For example, Novaco (2011) looked at anger as a driver for violent offending, and found that intense, frequent, and prolonged periods of anger are predictive of violent offences, as intense anger will take precedence over normative beliefs about violence.[94] These findings are supported by Gilbert et al., (2013), who found that high trait anger was more likely to trigger aggressive behaviour.[95]

A 2017 meta-analysis examining the effectiveness of CBT anger management interventions on recidivism in adult men, covered 14 treatment programs that varied in duration, ranging from 24 to 330 hours, and location. While most were delivered in prisons, some were delivered in the community. Methods also varied, but all had cognitive behavioural components and focused at least in part on anger.[96] The use of CBT anger management was found to reduce the risk of general recidivism by 23% and of violent recidivism by 28%. The authors found that completion of the treatment program was an important success factor. Rates of recidivism were higher in studies that included results for participants who did not complete the program compared to studies that excluded them.[96] These findings are consistent with an earlier (2007), larger (58 studies) meta-analysis of CBT management, which found an overall reduction in offending of 25%.[97]

While large scale studies on the impact of CBT specifically on alcohol-related violence are lacking, it would appear there is potential for positive impact based on the benefits to addiction and the benefits to violent offending more generally. In addition, there is some limited evidence that CBT can reduce intimate partner violence perpetration for alcohol abusers. Since CBT treatment is individually tailored, it has been hard for researchers to find opportunities to assess impact at scale, though what does exist, albeit with very small sample sizes, shows promise.[98,99]

3.4.3 Restorative justice conference

Target behaviour: Violence

Evidence quality rating: quite strong evidence

This review has focused on evidence specifically related to the prevention of alcohol-related violence. However, there are strategies to reduce violence more generally which may be relevant.

Restorative justice (RJ) is a technique that facilitates a conversation between the victim and the offender, where the offender is invited to describe the crime committed and the victim is invited to describe what impact that crime caused. Specific details and content can vary in order to be tailored to the participants and the offence. At its heart, it is designed to expose offenders to constructive moral experiences in order to develop their sense of what is right, as well as giving victims the chance to express themselves to the offender and receive an apology.

RJ conferences are often scheduled within the framework of prosecution (i.e. prosecution may be deferred or overlooked if the offender agrees to attend a conference). Observed effect sizes for RJ interventions range from 7-45% in reduced repeat arrests and RJ has been particularly successful at reducing violent crimes. RJ is also very cost effective, showing a return of £14 saved for every £1 spent in London.[100]

The review has not found any examples of RJ interventions being applied specifically to alcohol-related violence, but the consistent evidence of impact for violence reduction more generally suggests it is likely to be effective.

3.4.4 Sobriety tags

Target behaviour: Risky drinking

Evidence quality rating: Ineffective

Sobriety tags – a compulsory monitor worn on the wrist of an offender to assess the level of alcohol in the bloodstream by sampling sweat every 30 minutes – were introduced into UK legislation after pilots in Wales and London in 2016. These tags built on successful interventions of remote electronic sobriety monitoring (referred to as Secure Continuous Remote Alcohol Monitoring – SCRAM) conducted in South Dakota, Wisconsin and Nebraska, USA.[101]

The American programs showed mixed results, with lower rates of offending whilst monitoring was in place but higher rates after it was removed, against a comparison group. The UK results, which used a propensity score matched impact assessment design, showed no difference in offending between those offenders given sobriety tags and those who weren't over a 12-month period. It should be noted that the cost of implementing the tags in the UK is about £2,500 more per person than the cost of a community sentence involving probation supervision.[102]

4 Next steps

This RER presents international evidence on interventions to address alcohol-related violence and includes, where possible, information on those aspects that were most effective. It is recommended that the next stage of the WA MVP Pilot focuses on understanding what types of violence are most prominent, where the most harm comes from, which offenders are causing that harm and how their behaviour is shaped. This insight should then be combined with the evidence from this RER to determine not only the most appropriate interventions to trial but also how they should be implemented, balancing feasibility, local circumstances, and likely effectiveness. For example, in some cases the most suitable intervention will focus on reducing alcohol consumption but in other cases the problem of violence may be successfully reduced without changing alcohol consumption.

To aid the process of selecting an intervention to implement, we recommend creating a mini-ToC for all short-listed interventions being considered for implementation in a particular hotspot or with a particular cohort of individuals. A ToC helps with consideration of how and why an intervention is intended to affect proximal and distal outcomes. Because the world is complex, interventions focused on distal outcomes may not produce outcomes that are observable within the WA MVP Pilot timeline or scalable to other parts of WA. A ToC will also help to engage stakeholders in the logic of how the intervention is intended to change behaviour so that they can provide appropriate implementation support.

In conclusion, this RER is intended as a starting point for the WA MVP working group to:

1. Assess the situation in WA MVP Pilot area hotspots (e.g., a specific licensed venue or specific street) to identify the drivers of target behaviours. This requires a thorough understanding of the context through methods such as ethnography as detailed in the TESTS guide.[103]

2. Consider the evidence in this RER for interventions that show promise in multiple contexts which are comparable to the WA MVP Pilot area hotspots, but also talk to local stakeholders about ideas they may have for changing target behaviours based on their observations.

3. Build on the interventions in this RER to develop bespoke strategies that can feasibly be implemented in the WA MVP Pilot area hotspots with strong stakeholder support.

Annex 1: Current Western Australian Context

Risky drinking and associated harms

Risky drinking is defined as either consuming:

- More than 10 standard drinks per week on average.
- More than 4 standard drinks on any one day at least once a month on average.[104]

In Australia, alcohol-related harm is significantly more likely in those who exceed lifetime risk guidelines, with 4.2% requiring medical attention for injuries sustained while drinking or due to intoxication, compared with 0.3% among low-risk drinkers.[105]

Alcohol is also significantly involved in community violence in Australia:

- A third of domestic assaults are alcohol-related.[106]
- Almost half of non-domestic assaults during weekends are alcohol-related. Licensed venues are a common setting for incidents of alcohol-related violence, with an estimated 40% of reported assaults in Australia occurring in entertainment precincts.[107]

In 2019-20, 5.7% of all hospitalisations in Australia were alcohol-related:[108]

- Falls (40%), intentional self-harm (25%), assault (15%) and transport (7%) were the leading causes of alcohol-related hospitalisations.
- Males were 1.5 times as likely to be hospitalised as females.
- The highest rates of alcohol-related hospitalisations were for those aged 45–54.
- Very remote areas of Australia had the highest rates of alcohol-related hospitalisations, almost 11 times the rate for people living in major city areas.

Alcohol use in Western Australia

In 2022-23, more Western Australians consumed alcohol in ways that put their health at risk (33%) compared with the national average (31%).[109] However, the proportion of the WA population aged 14 and over who consumed alcohol daily declined from 6.5% in 2016 to 5.3% in 2022-23. This decline is largely attributable to the behaviour of younger people. Rates of alcohol consumption among older adults has remained constant or has increased over this period.[110]

A 2022 report[111] by a network of health and welfare organisations concerned about harm from alcohol in WA showed that each week in WA there are:

- Eight alcohol-related deaths.
- 402 alcohol-related hospitalisations (excluding emergency department presentations).
- 180 alcohol-related family violence assaults.

The report also shows that the toll from alcohol on public services has been increasing:

- The number of alcohol-related emergency department presentations has increased from 6,118 per year in 2014 to 9,455 per year in 2019.
- There was an 8% increase in ambulance callouts due to alcohol between 2020 and 2021.

The WA Government estimates alcohol use costs the state $3.1 billion per year, with only an estimated 0.2% of this recouped through alcohol licensing fees.[112]

Alcohol strategy in Western Australia

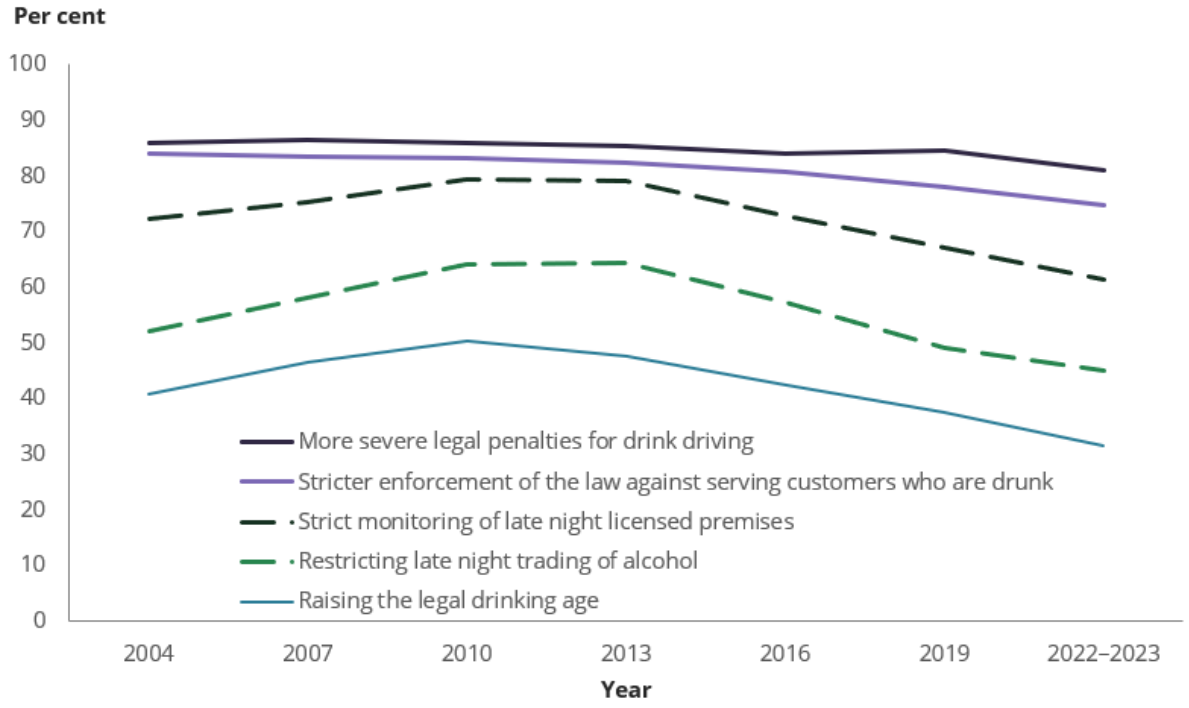
Consistent with the National Alcohol Strategy 2019-2028, Western Australia structures its approach to alcohol problems around three pillars: reducing demand for alcohol, reducing supply of alcohol, and reducing harm from alcohol.[113]

According to the National Drug Strategy Household Survey,[114] support among Western Australians for alcohol-related policies declined between 2019 and 2022–2023. The biggest declines occurred for raising the legal drinking age (from 41% to 34%) and more severe legal penalties for drink driving (from 86% to 81%). See Figure A1.

Limiting alcohol advertising online and on social media was supported by 67% of people.

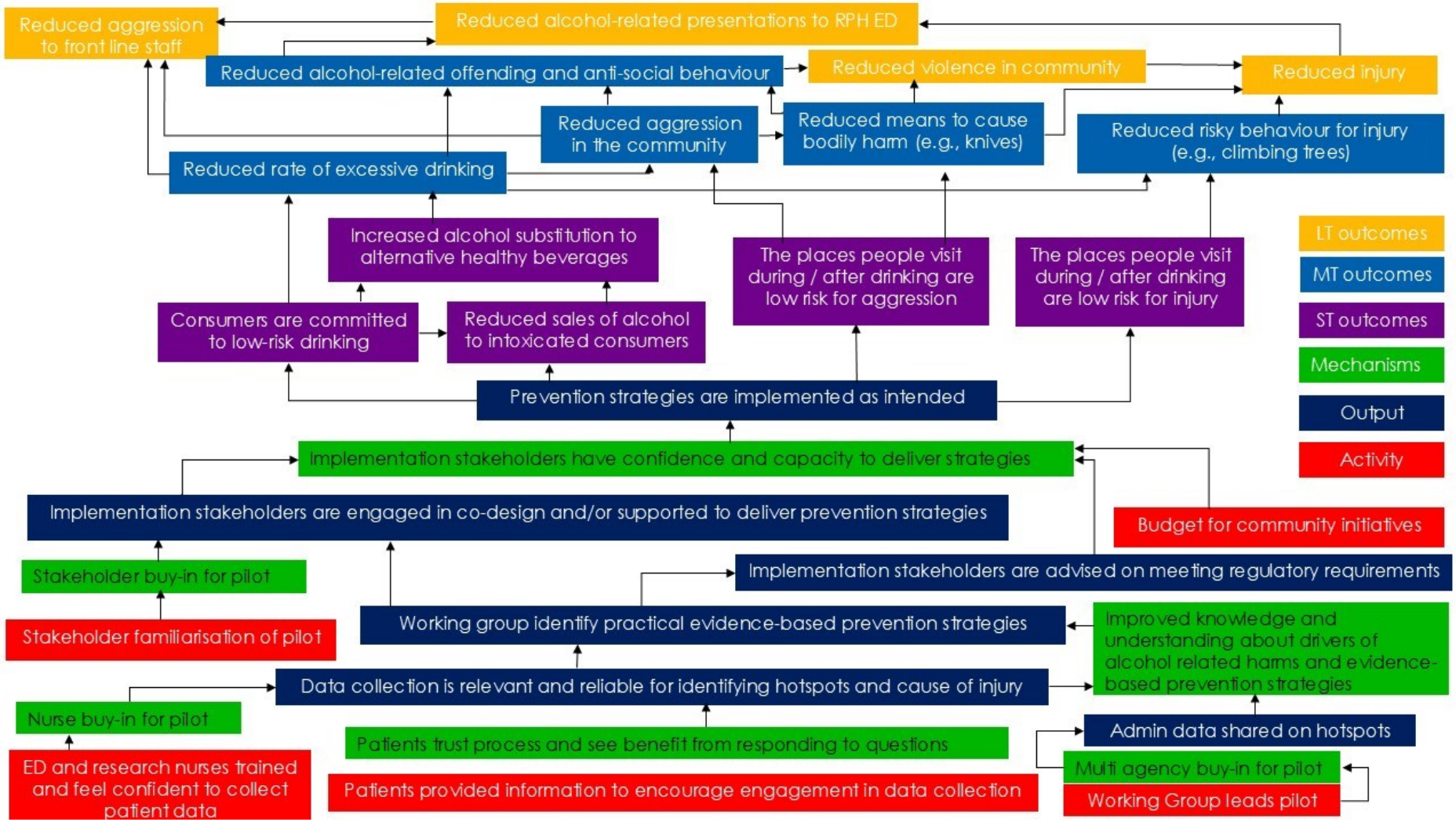
Restrictions on where zero-alcohol products with an alcohol brand can be displayed and sold in stores was supported by 34% of people.

Figure A1. Alcohol-related policy measures with the largest change in support, people aged 14 and over, 2004 to 2022–2023



Source: NDSHS 2022–2023, Table 4.68.

Annex 2: WA MVP Pilot Theory of Change



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