



Home Office

# **The likely impacts of increasing alcohol price: a summary review of the evidence base**

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# EXECUTIVE SUMMARY

## INTRODUCTION

### AIMS

This review aimed to summarise the research evidence around the likely impact of policies designed to increase the price of alcoholic drinks in order to answer the following research questions.

- 1) What does the research evidence tell us about the likely impact of increasing alcohol price on social outcomes (specifically crime and disorder, public health and workplace productivity effects)?
- 2) To what extent does the research evidence tell us about the distributional impacts (particularly across different income groups and responsible drinkers but also to binge drinkers and young people) of increasing alcohol price?
- 3) What does the research evidence suggest is the likely impact of increasing alcohol prices on costs and benefits to business (particularly on the on trade and producers)?

In answering the above research questions this review also sought to identify limitations and gaps in the research evidence reviewed.

### CONTEXT

In 2010 the Coalition Government published its programme for partnership Government '*The Coalition: our programme for Government*,' which made a number of commitments in relation to alcohol pricing. The first commitment is to ban the sale of alcohol below cost price, and the second is to review alcohol pricing and taxation to ensure it tackles binge drinking without unfairly penalising responsible drinkers, pubs and important local industries.

The Home Office and HM Treasury are jointly reviewing the impact of policies designed to raise the price of alcoholic drinks, with the Home Office leading on price and HM Treasury on tax. This report presents the extent and strength of the evidence base.

### METHODOLOGY

This review draws primarily on findings contained in research commissioned by the Home Office to understand the potential impacts of increasing alcohol price and to identify the completeness and robustness of evidence in this area. The research comprised:

- A Rapid Evidence Assessment (REA) of the published research literature examining alcohol pricing and criminal harm (Booth et al, 2010);
- A REA on the potential economic impact of three alcohol pricing policies (taxation, minimum pricing and a ban on the sale of alcohol below cost price) and a preliminary economic analysis on the market for alcohol (Hunt et al, 2010); and
- Market research examining public perceptions of alcohol pricing (Banerjee et al, 2010).

This paper also considers the evidence contained in three other pieces of research, selected to address areas not specifically covered in the Home Office commissioned research to ensure a more comprehensive review of the evidence base. Studies were:

- A Systematic Review of the evidence on the effects of alcohol pricing and promotion (Booth et al, 2008);

- A modelling study examining the potential impact of pricing and promotion policies for alcohol in England (Brennan et al, 2008); and
- A recently published paper examining the purchasing patterns for low price off sales alcohol (drawing on evidence from the Expenditure and Food Survey) (Ludbrook, 2010).

## **FINDINGS**

### **THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON ALCOHOL RELATED HARMS AND OUTCOMES**

- On balance the evidence shows that increases in alcohol prices are linked to decreases in harms related to alcohol consumption. However, alcohol price is only one factor affecting levels of alcohol consumption with individual, cultural, situational and social factors also influential.
- Available evidence suggests that increases in alcohol prices tend to be associated with reductions in crime. However, this relationship is not straightforward and linear and the evidence base is not able to support a causal relationship between alcohol pricing and crime.
- When considering individual crime types rather than overall crime, there is a larger evidence base for a link between alcohol price and violence than for other crime types. The balance of this evidence tends to support an association between increasing alcohol price and decreasing levels of violence. No firm conclusions can be drawn around links between alcohol pricing and other specific crime types as the evidence is limited and some findings are inconclusive.
- It is important to recognise that inconclusive evidence or an absence of evidence does not necessarily mean that increasing alcohol price does not impact on particular types of crime. Rather, this indicates that there is a lack of robust evidence to allow a judgement to be made either way.
- Focus groups, designed to test reactions to pricing policies, reported an overall consensus of respondents not wanting to see an increase in the price of alcohol. There was conflict between a belief that only large price increases would have an impact on crime and disorder and a reluctance to be subject to such price increases.
- The modest evidence available on workplace productivity indicates a negative correlation with alcohol consumption (rather than price per se) but this evidence is not able to support a causal relationship for a link with alcohol pricing.
- Overall the research literature supports an established association between alcohol consumption and many negative health outcomes and the balance of research finds that increases in alcohol prices are linked to decreases in these health harms.

### **DISTRIBUTIONAL IMPACTS OF INCREASING ALCOHOL PRICE**

- The evidence revealed that increasing alcohol price may have distributional impacts on different population groups; however the impact on some of these population groups is under researched and some findings are mixed, therefore it is difficult to draw any firm conclusions. The evidence reviewed tends to suggest that increasing alcohol price reduces heavy drinking and some studies also suggest that heavy drinkers may be more affected by price increases than responsible moderate or occasional drinkers.
- The evidence supports the general principle that increasing alcohol price reduces alcohol consumption by young people and also suggests that binge, hazardous, harmful and younger

drinkers tend to choose cheaper alcoholic beverages.

- Little is known about the impact of increasing alcohol price on different income groups. Findings are limited to two studies; one of which indicates that low socio-economic groups may be more responsive to changes in alcohol affordability whilst the other reported that all income groups purchased low price off sales alcohol, although low income groups were less likely to purchase off sales alcohol at all.

## **THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON COSTS AND BENEFITS TO BUSINESS**

- Available research on the economic impacts of different alcohol pricing policies and the exact magnitude of effects which each pricing policy may have is very limited.
- Evidence around how the alcohol industry may be affected by pricing policies is limited to findings from one small scale study, which only provides an indication of the way in which the UK alcohol market may react. Evidence from this study indicates that major retailers may benefit more from pricing policies than producers, and that both producers and supermarkets (and to some degree the on trade) may adopt strategies to avoid potential losses or to keep prices the same following an introduction of a pricing policy.

## **LIMITATIONS OF THE EVIDENCE BASE**

- Much of the evidence base on alcohol pricing and criminal harm related to alcohol consumption is not UK based. The degree of transferability of findings may vary depending on the country where the research was undertaken. UK based research is mainly limited to economic modelling studies with relatively few evaluations of alcohol pricing changes.

For more detail on limitations and gaps in the research evidence base please see Annex 2.

## **CONCLUSIONS**

On balance the international evidence base suggests that policies designed to increase the price of alcohol may be effective in reducing the harms caused by alcohol. However, alcohol price is only one factor that may affect levels of alcohol consumption, with individual, cultural, situational and social factors also influential.

This review has highlighted that a number of potential impacts of increasing alcohol price are currently under researched. The evidence revealed that there is limited UK based research on alcohol pricing and criminal harm related to alcohol consumption, with UK evidence, in the main, limited to theoretical economic modelling studies. The evidence base for a link between alcohol pricing and crime is less comprehensive than that between alcohol price and consumption and alcohol price and health harms. Although evidence for a link between alcohol price and crime suggests that price increases tend to be associated with reductions in crime, this relationship is not linear and the evidence base is not able to support a direct causal link. For individual crime types rather than overall crime, the evidence base for a link between alcohol price and violence is largest with the balance of evidence tending to support this link.

Less is known about the potential distributional impacts on specific population groups, such as the impact on different income groups or how policies will impact on the majority of responsible drinkers, with the body of evidence tending to focus on impacts to heavier and younger drinkers. Little is known about how the alcohol industry may be affected by alcohol pricing policies.

On the basis of the evidence reviewed, it is not possible to determine which alcohol pricing policies may be the most effective.

# 1. INTRODUCTION

This paper presents findings from a review of the evidence around the impacts of alcohol pricing. It aims to summarise the research evidence around the likely impacts of increasing alcohol price. In doing so, it attempts to answer the following research questions:

- 1) What does the research evidence tell us about the likely impact of increasing alcohol price on social outcomes (specifically crime and disorder, public health and workplace productivity effects)?
- 2) To what extent does the research evidence tell us about the distributional impacts (particularly across different income groups and responsible drinkers but also to binge drinkers and young people) of increasing alcohol price?
- 3) What does the research evidence suggest is the likely impact of increasing alcohol prices on costs and benefits to business (particularly on the on trade and producers)?

In answering the above research questions this paper also seeks to identify limitations and gaps in the research evidence reviewed.

## 1.1 BACKGROUND

Alcohol is a factor in offending behaviour, particularly violent offending. The 2009/10 British Crime Survey (BCS), found that the victim perceived the offender(s) to be under the influence of alcohol in half (50%) of reported violent offences, with 19% of all violent incidents, and 31% of stranger violence, taking place in or around a pub or club. Although the number of alcohol related violent incidents in 2009/10 was similar to the levels in 2008/09, within the context of an overall fall in violent crimes measured by the BCS, long-term trends show an increase since 1995 in the BCS violent incidents that are alcohol-related (Flatley et al, 2010).

The nature of the alcohol related harm problem in the UK is well documented. The latest statistics<sup>1</sup> on alcohol, by the National Health Service Information Centre for Health and Social Care, highlight that in 2008 there were 6,769 deaths directly related to alcohol, which is an increase of 24% from 2001. They also show that in 2007, 24% of adults (33% of men and 16% of women) were classified as hazardous drinkers (this includes 6% of men and 2% of women estimated to be harmful drinkers, the most serious form of hazardous drinking, which means that damage to health is likely). Alcohol was 69% more affordable in the UK in 2007 than in 1980 (NHS, 2009 quoted in Hunt et al, 2010) and it is reported that this increase in the affordability of alcohol has been associated with the increase in alcohol consumption (Hunt et al, 2010).

In 2010 the Coalition Government published its programme for partnership Government '*The Coalition: our programme for Government*,' which made a number of commitments in relation to alcohol pricing. The first commitment is to ban the sale of alcohol below cost price, and the second is to review alcohol pricing and taxation to ensure it tackles binge drinking without unfairly penalising responsible drinkers, pubs and important local industries.

The Home Office and HM Treasury are jointly reviewing the impact of policies designed to raise the price of alcoholic drinks, with the Home Office leading on price and HM Treasury on tax. This report presents the extent and strength of the evidence base.

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<sup>1</sup> See NHS Information Centre for Health and Social Care report 'Statistics on Alcohol: England, 2010' ([http://www.ic.nhs.uk/webfiles/publications/alcohol10/Statistics\\_on\\_Alcohol\\_England\\_2010.pdf](http://www.ic.nhs.uk/webfiles/publications/alcohol10/Statistics_on_Alcohol_England_2010.pdf)).

## 1.2 METHODOLOGY

This review draws primarily on findings contained in research commissioned by the Home Office to understand the potential impacts of increasing alcohol price and to identify the completeness and robustness of evidence in this area. These reports are summarised in Table 1.1.

**Table 1.1:** Details of research documents reviewed

Title of research	Authors	Methodology
Alcohol pricing and criminal harm: a rapid evidence assessment of the published research literature	Booth, A., Meier, P., Shapland, J., Wong, R. and Paisley, S. (2010)	This report is a Rapid Evidence Assessment commissioned to explore the evidence for a direct link between alcohol price and crime, disorder and Anti-Social Behaviour to answer the question “To what extent does the research evidence support a direct association between alcohol price and crime and disorder”?
Preliminary analysis of the economic impacts of alcohol pricing policy in the UK	Hunt, P., Rabinovich, L. and Baumberg, B. (2010)	This report was commissioned to provide a preliminary assessment of potential economic impacts of pricing policy options. It used both qualitative and quantitative methods including a Rapid Evidence Assessment, a preliminary economic analysis (a presentation of data on the UK market for alcohol) and interviews with representatives of the alcohol industry, business and economic academics.
Public perceptions of alcohol pricing: market research report	Banerjee, J., Squires, J. and Parkinson, T. (2010)	This market research study was undertaken in an attempt to gauge public opinion on alcohol pricing. It involved a quantitative survey which explored drinking behaviour, views on alcohol consumption, attitudes on price intervention and the relationship between alcohol and crime and disorder. This study also included qualitative focus groups, designed to test reactions to pricing policies.

This paper also considers the evidence contained in three other pieces of research, selected to address areas not specifically covered in the Home Office commissioned research to ensure the evidence base reviewed was more comprehensive. These reports are summarised in Table 1.2.

**Table 1.2:** Details of additional research documents reviewed

Title of research	Authors	Methodology
Independent review of the effects of alcohol pricing and promotion: part a – systematic reviews	Booth, A., Brennan, A., Mejer, P., O’Reilly, D., Purshouse, R., Stockwell, T., Sutton, A., Taylor, K., Wilkinson, A. and Wong, R. (2008)	This research aimed to provide answers to key questions about the relationship between alcohol promotions including pricing, level of consumption and alcohol related harm. The study included two Systematic Reviews; the first investigated the relationship between tax/price and alcohol consumption or directly to harm and the second investigated the relationship between advertising/promotion and alcohol consumption or directly to harm. It also included a Review of Reviews which investigated the relationship between alcohol consumption and outcomes.
Independent review of the effects of alcohol pricing and promotion: part b – modelling the potential impacts of pricing and promotion for alcohol in England: results from the Sheffield alcohol policy model version 2008 (1-1)	Brennan, A., Booth, A., Mejer, P., O’Reilly, D., Purshouse, R., Rafia, R., Stockwell, T., Sutton, A., Taylor, K., Wilkinson, A. and Wong, R. (2008)	This research (phase 2 of the research described above) is a modelling study of the potential implications of pricing and promotion policies for alcohol in England. Its aim was to model the potential implications of changes to current policies, especially the population based impact on health, crime and wider economy, for the population as a whole but also for young people, 18-24 binge drinkers and harmful drinkers whose patterns of drinking damage their physical/mental health or cause substantial harm to others.
Purchasing patterns for low price alcohol: evidence from the expenditure and food survey – paper for Scottish health action on alcohol problems	Ludbrook, A. (2010)	This paper is an analysis of UK data from the Expenditure and Food Survey (EFS). Analysis of total off sales was used to provide overview of purchasing patterns of different income groups. It was commissioned in Scotland following concern about possible regressive effects (that it results in raising alcohol pricing only for households with lower incomes or that it affects those with low incomes more than others) of a minimum pricing intervention.

It is important to note this report does not present an exhaustive review of all available evidence. However, as the research studies reviewed encompass a number of Systematic Reviews and Rapid Evidence Assessments (REA), it is felt that the key literature around alcohol pricing will be extensively covered. A description of the types of methods used in the studies reviewed is outlined in Annex 1.

As this review is focusing on policies designed to increase alcohol price, the emphasis is based on evidence around the impact of increasing, rather than decreasing, alcohol price.

### **1.3 STRUCTURE OF THE REPORT**

The remainder of this report is structured into two sections. Chapter two presents a brief overview of the evidence around the impact of increasing alcohol price on alcohol consumption and a summary of the evidence around each key research question. Chapter three draws together conclusions on the existing evidence around the likely impacts of increasing alcohol price. Annex 1 provides a description of the types of evidence reviewed and Annex 2 sets out the limitations and gaps in the research evidence base.

## 2. SUMMARY OF THE EVIDENCE

This chapter first summarises the existing evidence on the relationship between increasing alcohol price and the consumption of alcoholic drinks, because any likely impacts of increasing alcohol price on harms will result from changes in alcohol consumption. It then addresses each research question based upon the available research literature.

### 2.1 THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON THE CONSUMPTION OF ALCOHOLIC DRINKS

There is a large body of existing evidence examining the impact of price on the consumption of alcohol. A Systematic Review (Booth et al, 2008) investigating this relationship reports that impacts of price changes on alcohol consumption has been more extensively investigated than any other outcome. This review finds a consistently negative relationship, i.e. increased price is associated with reduced consumption. However, although the direction is the same, the review points to significant variation in the size of this relationship across the studies analysed. These studies were from four different countries - USA, Australia, Switzerland and the UK<sup>2</sup>. The authors explain this finding by the fact that alcohol does not consist of one product and they report that estimates of price elasticities<sup>3</sup> vary by type of beverage, country, the population group (such as age of the consumer) and quality of product (Stockwell and Gruenewald, 2003 quoted in Booth et al, 2008). It is also proposed that different social, cultural and economic circumstances of the country where the research has been conducted may also explain this difference in size of effect (Ludbrook et al, 2002; Babor et al, 2003 quoted in Hunt et al, 2010).

Hunt et al (2010); Booth et al (2010) also report on this link between price and consumption. One concludes that there is “an extensive body of evidence that demonstrates that consumers respond to changes in alcohol prices in much the same way as they respond to changes in the price of other commodities. That is, increases in alcohol price generally lead to decreases in consumption and vice versa” (Hunt et al, 2010). The second states that the evidence for this link between changes in alcohol price and inverse changes in consumption is strong and well established, but it also reports that price is only one factor influencing levels of consumption; with individual, cultural and social factors also playing a role (Booth et al, 2010).

#### KEY FINDINGS

- **There is consistently strong evidence to suggest that increasing alcohol price is associated with reduced consumption, however, the research shows significant variation in the size of this relationship.**
- **Alcohol price is only one factor affecting levels of alcohol consumption – individual, cultural and social factors are also influential.**

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<sup>2</sup> Only one study from the UK was included in this Systematic Review linking pricing to consumption.

<sup>3</sup> Hunt et al (2010) describe the price elasticity of demand as “the sensitivity of consumption to changes in the monetary price of a product (i.e. the percentage change in consumption resulting from a 1-percent increase in price)”.

## **2.2 THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON ALCOHOL RELATED HARMS AND OUTCOMES (SPECIFICALLY CRIME AND DISORDER, PUBLIC HEALTH AND WORKPLACE PRODUCTIVITY)**

In addition to the relationship between price and consumption there has also been research undertaken that looks at the changes in alcohol price and its impact on harms and outcomes, which occur through changes to consumption. The relationship between increasing alcohol price and its impact on various harms is not always straightforward as a linear relationship does not always exist. The research literature describes how alcohol harms are classified into alcohol specific harms and alcohol related harms and can be either acute (associated with a single drinking occasion) or chronic (occur following a sustained period of alcohol consumption) (Booth et al, 2008). Alcohol specific harms, such as diseases or arrests for being drunk and disorderly, are directly linked to the consumption of alcohol, whilst for alcohol related harms, such as violent assaults, the consumption of alcohol is thought to be a contributory factor in a proportion of cases (Booth et al, 2008).

Booth et al's (2008) Systematic Review concludes that a large number of studies consistently support an association between increases in alcohol price and reductions in harm<sup>4</sup>. This finding is supported by a recent REA (Hunt et al, 2010) that examined the potential economic impacts of alcohol pricing policy in the UK. Hunt et al (2010) summarise that on balance the research shows that increases in alcohol prices are linked to decreases in harms related to alcohol consumption and decreases in prices lead to increases in such harms. Consequently, this same author concludes that the research indicates that policies designed to increase the price of alcohol can be effective in reducing alcohol harms.

The evidence included in Hunt et al's (2010) recent research gives an indication of the direction of effects of three different alcohol pricing policies (taxation, minimum pricing and a ban on alcohol sales below cost) and it suggests that "the magnitude of these effects depend to a significant extent on the type of pricing policy used; an increase in excise duty rates may have a different effect than an increase in the minimum price of alcohol". However, this study cannot provide a clear indication of the actual magnitude of each pricing policy. There are also likely to be other factors in play particularly around how each option is implemented, for example whether a minimum unit price of 20p or 50p is adopted or if a ban on alcohol sales below cost defines cost in broad terms.

### **THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON CRIME AND DISORDER**

The evidence base exploring the relationship between changes in alcohol pricing and crime and disorder is less comprehensive than that between alcohol price and consumption. A lack of evidence around alcohol pricing and its impact on crime may be due in part to the fact that there has not been a one off increase in alcohol price in some countries, such as the UK, which could have been robustly evaluated. Additionally, some alcohol pricing policies are currently not used very extensively so it is difficult to obtain robust evidence on their potential impact. Most available evaluation research (rather than modelling studies) examining the impact on increasing alcohol price on crime has examined increases in taxation. It is important to recognise that an absence of evidence or inconclusive evidence does not necessarily mean that increasing alcohol price does not impact on particular types of crime. Rather, this indicates that there is a lack of robust evidence to allow a judgement to be made either way.

The available evidence does not indicate a straightforward linear relationship between alcohol consumption and crime; there is little evidence to suggest that drinking alcohol directly causes

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4 Four of these studies in this Systematic Review linking price and harm are UK based.

individuals to commit crime. The evidence reviewed does highlight a positive correlation between alcohol consumption and violent incidents (Gmel and Rehm, 2003 quoted in Hunt et al, 2010). However, Hunt et al's REA (2010) indicates that proving any causal relationship for this correlation is complicated, because there are a number of confounding variables and questions about this link; such as whether the deciding factor is a pharmacological one (alcohol affects parts of the brain related to decision making and impulse control), a social and cultural one (certain social contexts inhibit or disinhibit drinking and violent acts), or whether it is a mixture of the two (Hunt et al, 2010).

Booth et al's (2008) Review of Reviews investigated the relationship between alcohol consumption and alcohol related harms and outcomes and were unable to identify any recent Systematic Reviews or Meta-Analyses that examined the effects of alcohol consumption (rather than price) on any crimes other than violence. This same author does highlight that there is sufficient evidence to suggest a significant proportion of criminal behaviour can be associated with alcohol misuse, but suggests it is methodologically difficult to ascertain the alcohol attributable fraction<sup>5</sup> for this association. (Booth et al, 2008).

A recent REA<sup>6</sup> (Booth et al, 2010) looking to explore the association between alcohol pricing and crime found that "on the whole, prices and tax increases tend to be associated with reductions in crime". (Booth et al 2010). When considering individual crime types rather than overall crime, the evidence base for a link between alcohol price and violence is larger than for other crime types. Booth et al's (2010) REA found that studies around alcohol price and violence were the most prevalent<sup>7</sup>. The violence studies included: evaluation studies, which showed that taxation increases in Australia and the US led to reductions in violent crime<sup>8</sup>; several correlation studies (including some from the UK), which supported an association and, with two exceptions, modelling studies which estimated that higher prices are associated with reductions in violent crime (Booth et al, 2010). This REA also reported an association between alcohol pricing and sexual assault, albeit the majority of this evidence is theoretical as it comes from modelling studies which estimate reductions<sup>9</sup>.

Booth et al's (2010) REA reports some modest evidence for a link between alcohol pricing and criminal damage, which comes from four studies<sup>10</sup>. No firm conclusions could be drawn on a link between alcohol pricing and homicide, domestic violence, public order offences, drunk and disorderly behaviour and robbery as only a few studies, some with inconsistent findings, were available. This REA found no evidence in relation to anti-social behaviour.

An England based study modelled the potential impact of pricing for alcohol (Brennan et al, 2008). This study estimated that crime harms reduce as alcohol prices are increased, with crime reductions modelled for violent crime, criminal damage and theft, robbery and across other crimes. However there are some limitations to this modelling for crime harms which should be considered when interpreting these findings (please see Annex 2 for limitations in the research evidence).

There is some limited evidence on public perceptions to increasing alcohol price from one

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5 Alcohol attributable fractions "are used internationally in the literature to express the extent to which alcohol contributes to a health outcome (such as deaths or hospital admissions) or other outcomes such as road traffic injuries, drownings, violence, crime, and homicides" (Scottish Government report 'The Societal Cost of Alcohol Misuse in Scotland 2007', <http://www.scotland.gov.uk/Resource/Doc/297819/0092744.pdf>).

6 This REA included 36 studies, 12 of which were evaluations examining what happened when taxes/prices were increased or decreased in a variety of settings and the remaining 24 were modelling studies.

7 There were 19 studies meeting the inclusion criteria for an association between alcohol price and violence.

8 Although taxation decreases in Scandinavia found no significant effects on violent crime (REA et al, 2010).

9 Eight modelling studies, seven of which estimates reductions in sexual assault associated with beer tax/price increases. One large correlation study found that higher alcoholic beverage prices and lower incidences of sexual assaults.

10 These studies consisted of three modelling studies and one correlation study.

recent market research study (Banerjee et al, 2010), which was undertaken in attempt to gauge public opinion on this matter. This study involved a non-random quantitative survey which explored perceptions around drinking behaviour, views on alcohol consumption, attitudes on price intervention and the relationship between alcohol and crime and disorder. This study also included qualitative<sup>11</sup> focus groups<sup>12</sup>, designed to test reactions to pricing policies.

This study found that there was an overall consensus in the focus groups that respondents didn't want to see an increase in the price of alcohol, with conflict reported between a belief that only large price increases would have an impact on crime and disorder and a reluctance to be subject to price increase. The survey reported that almost universally across different types of drinkers<sup>13</sup>, alcohol was seen to be contributing to levels of crime and anti-social behaviour (ASB). Low price alcohol was also more likely to be thought to contribute to levels of crime and ASB than alcohol in general. However the qualitative findings suggest that alcohol pricing was felt to be only one part of the solution to tackling crime and disorder, with other factors such as education or social interventions suggested. Accordingly, if such pricing interventions were introduced, respondents felt they should form part of wider programme tackling these issues as there was a perception that pricing interventions alone would not reduce crime and disorder (Banerjee et al, 2010).

Almost half of the respondents to the survey claimed to support an increase in alcohol price. Interestingly, those who would support an increase in alcohol price increased to just over two thirds if a link between cheap alcohol and levels of crime and ASB could be proved. However, only a low proportion of drinkers surveyed (one in five) claimed they would drink less alcohol if the price of alcoholic drinks was raised.

### THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON PUBLIC HEALTH

There is much research examining the effects of changes in alcohol pricing on various outcomes related to alcohol consumption such as liver mortality and other chronic health conditions (Hunt et al, 2010). Previous research<sup>14</sup> by Rehm et al (2003 quoted in Booth et al, 2008) established a relationship between alcohol consumption and 60 diseases, and the results from this study indicate that alcohol use increases the risk for many chronic health consequences (for example diseases) and acute consequences (for example traffic crashes)<sup>15</sup> (Booth et al, 2008). Additionally, it is suggested that a broad general consensus exists regarding both long term health conditions and acute effects of alcohol consumption, but the evidence is more equivocal when it relates to optimal and harmful consumption levels and the duration of exposure for irreversible harm to be effected (Booth et al, 2008).

In Booth et al's (2008) Review of Reviews the following conclusions on alcohol consumption and health related outcomes were drawn:

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11 The findings of the qualitative aspect of this study outline the views and perceptions of those who participated in the focus groups to provide an invaluable insight and a richer understanding of respondent's perceptions of drinking behaviour, alcohol related crime and alcohol pricing policies. However, as with all qualitative work, the findings cannot be assumed to be representative of the wider population.

12 Eight focus groups were conducted across England and Wales (Leeds, London, Bridgend and Cheam). These groups comprised four groups of pre loaders (defined as those who regularly or occasionally drink at home or at a friend's home before going out to pubs, bars or clubs) aged 18 – 24 two groups comprised males and two comprised females, one group were frequent home drinkers mixed gender aged 40+, one group were frequent home drinkers mixed gender aged 25 to 39, one group were infrequent home drinkers mixed gender aged 40+ and one group were infrequent home drinkers mixed gender aged 25 to 39.

13 Banerjee et al (2010) adopt the Department of Health Sensible (Males 1-20 units of alcohol and females 1 – 13 units of alcohol per week), Increasing Risk (Males 21-50 units of alcohol and females 14-35 units of alcohol per week) and Higher Risk (Males 51 plus units of alcohol and females 36 plus units of alcohol per week) classification.

14 This research draws on published meta-analyses.

15 Booth et al (2008) also report that a certain pattern of regular light to moderate alcohol consumption may have beneficial effects on coronary heart disease.

- There is consistent evidence to suggest alcohol consumption is associated with substantially increased risks of all-cause mortality even in people drinking lower than recommended limits, and especially among young people;
- There is moderate, but methodologically disputed, evidence to suggest light alcohol consumption is associated with decreased level of risk from coronary heart disease. However high levels of consumption have detrimental effects;
- There is strong evidence that heavy alcohol consumption increases the risk of stroke;
- There is strong evidence for statistically significant associations with a wide range of cancers including some of the most common cancers in the UK;
- There is significant and consistent effect between alcohol consumption and serious injury and for heavy drinking and road accidents;
- There is moderate evidence to suggest that alcohol dependence is associated with increased risks of suicide (although there are methodological difficulties in making an attribution of suicide to the harmful effects of alcohol); and
- There is moderate evidence<sup>16</sup> to suggest that alcohol consumption is associated with increased incidence of sexually transmitted diseases (although there are significant difficulties in determining any causality).

[adapted from Booth, 2008]

Brennan et al's (2008) England based modelling study examined 47 conditions which are wholly attributable to alcohol, partially attributable to long term chronic alcohol use or partially attributable to the level of acute alcohol intake on a single occasion. It concluded that as prices increase, alcohol attributable hospital admissions and deaths are estimated to reduce, with prevented deaths occurring disproportionately in harmful drinkers. Brennan et al (2008) also report that on balance health harm reductions mostly relate to chronic diseases rather than acute conditions, such as injuries, because the alcohol attributable health harm occurs in middle age or older age groups at significant risk of developing or dying from chronic disease. This modelling study also suggests that policies resulting in bigger price increases reduce deaths in moderate and hazardous drinkers as well as harmful drinkers, and that policy options which increase prices for only a proportion of products and by marginal amounts have very small effects on hospital admissions (Brennan et al, 2008).

### THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON WORKPLACE PRODUCTIVITY

There is very little evidence within the research reviewed about the impact of increasing alcohol price on workplace productivity, unemployment or absenteeism. Booth et al's (2008) Review of Reviews did not identify any Systematic Reviews or Meta-Analyses that examined the effects of alcohol on employment related outcomes such as unemployment or absenteeism.

The impact of alcohol consumption on workplace productivity was discussed in Hunt et al's (2010) recent REA examining the potential economic impacts on alcohol pricing policy in the UK. This reported that alcohol consumption is negatively correlated with workplace productivity (Gmel and Rehm, 2003 quoted in Hunt et al, 2010). This evidence is not able to support a causal relationship and this REA suggests that causality from alcohol consumption to workplace productivity is complicated as many factors may affect workplace productivity, (such as boredom on the job, repetitive tasks, shift work and workload).

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<sup>16</sup> Eight out of eleven studies included in a systematic review (Booth et al, 2008).

## KEY FINDINGS

- **On balance the research shows that increases in alcohol prices are linked to decreases in harms related to alcohol consumption, indicating that policies designed to increase the price of alcohol may be effective in reducing alcohol harms.**
- **Although the evidence base is less comprehensive, on balance the evidence suggests that increases in alcohol pricing tend to be associated with reductions in crime. However, the available evidence does not indicate a straightforward linear relationship and the evidence base is not able to support a causal relationship for such a link.**
- **When considering individual crime types rather than overall crime the evidence base for a link between alcohol price and violence is larger than for other crime types. The balance of this evidence tends to support an association between increasing alcohol price and violence. No firm conclusions can be drawn around links between alcohol pricing and other specific crime types as the evidence is limited and some findings are inconclusive.**
- **It is important to recognise that inconclusive evidence or an absence of evidence does not necessarily mean that increasing alcohol price does not impact on particular types of crime. Rather, this indicates that there is a lack of robust evidence to allow a judgement to be made either way.**
- **A qualitative focus group study reported an overall consensus of respondents not wanting to see an increase in the price of alcohol, with conflict reported between a belief that only large price increases would have an impact on crime and disorder and a reluctance to be subject to price increase.**
- **Findings from the market research quantitative survey report that alcohol, in particular low price alcohol, was seen to be contributing to levels of crime and ASB. However, the qualitative focus study reported that alcohol pricing was felt to be only one part of the solution to tackling crime and disorder and if pricing interventions were introduced they should form part of wider programme tackling social, cultural and educational issues.**
- **The quantitative survey suggested there was more support for an increase in alcohol price if a link between cheap alcohol and levels of crime and ASB could be proven.**
- **There has been much research examining the effects of changes in alcohol pricing on various health outcomes related to alcohol consumption. Across the research literature there appears to be an established association between alcohol consumption and many negative health outcomes and the balance of research finds that increases in alcohol prices are linked to decreases in these health harms.**
- **This review found modest evidence that alcohol consumption is negatively correlated with workplace productivity. However the evidence base is not able to support a causal effect of this association.**

## 2.3 DISTRIBUTIONAL IMPACTS OF INCREASING ALCOHOL PRICE

### DIFFERENT TYPES OF DRINKERS

Any increase in alcohol price would impact on all types of drinkers. However, it has been reported that hazardous drinkers (for females more than 14 units and males more than 21 units per week) consume nearly 70% of all alcohol (Baumberg, 2009 quoted in Hunt et al, 2010) and therefore Hunt et al (2010) suggest that the magnitude of affect of pricing policies would be greater on hazardous and harmful drinkers.

It is suggested that there may be variation in the extent to which different types of drinkers respond to changes in alcohol price (Hunt et al, 2010). In Hunt et al's (2010) REA some studies reviewed suggest that heavy drinkers, just like moderate drinkers, change their consumption as alcohol drinks prices change, but other studies indicated that heavy drinkers are not very sensitive to price changes (Pacula and Chaloupka, 2001 quoted in Hunt et al, 2010). The authors of this REA suggest that this latter finding is not consistent with the balance of research, which shows that when alcohol price goes up alcohol related harms decrease. Additionally, an earlier Systematic Review (Booth et al, 2008), investigating this relationship between price and consumption, found that studies showed that increasing the price of alcohol reduces heavy drinking (Chaloupka et al, 2002 quoted in Booth et al, 2008). Furthermore, the same Systematic Review also reported that some studies have found that heavy drinkers may be more affected by price increases than moderate or occasional drinkers (Booth et al, 2008). This suggests that the research evidence, on balance, tends to support the finding that heavy drinkers are sensitive to price changes.

There is also evidence, mainly from modelling studies, that binge drinkers, hazardous drinkers and harmful drinkers tend to choose cheaper alcoholic beverages (Booth et al, 2008; Hunt et al, 2010). Hunt et al's (2010) REA reports that research from the UK, which is echoed by findings from studies in other countries, shows that changes in price of cheaper alcoholic beverages sold in the off trade have a stronger impact on hazardous drinkers (Meier et al, 2009 quoted in Hunt et al, 2010). Evidence from one study (Gruenewald et al's 2006 quoted in Hunt et al, 2010) showed that increases in alcohol prices led to consumers substituting with cheaper drinks or purchasing drinks in cheaper venues. Hunt et al (2010) conclude that findings from this one study indicate that while price changes have an important effect in changing what consumers' drink, increases in the price of the cheapest alcoholic beverages may lead to reductions in consumption because consumers have no cheaper alcoholic alternatives. On balance, this available evidence suggests that heavier drinkers tend to choose cheaper drinks; therefore changes in the price of the cheapest drinks may impact more on this type of drinker.

### YOUNG PEOPLE

A recent UK study (Bellis et al, 2007), which looked at predictors of risky alcohol consumption in school children and the implications for preventing alcohol related harm, found that UK youth have among the highest levels of alcohol consumption and binge drinking in the EU and experience drunkenness at an earlier age (Bellis et al, 2007 quoted in Hunt et al, 2010). The same study found a strong relationship between the disposable income available to teenagers and their likelihood to binge drink (Bellie et al 2007 quoted in Booth et al, 2008 and Hunt et al, 2010). Research by Chaloka and Pacula (2002 quoted in Hunt et al, 2010) also suggests that alcohol abuse during youth is associated with the abuse of alcohol in later life.

There has been a significant amount of research focused on the price sensitivity of young drinkers (Hunt et al, 2010). The literature suggests that young people may be especially sensitive to changes in alcohol price (Booth et al, 2008; Hunt et al, 2010). In their Systematic Review Booth et al (2008) report that studies have found that increasing alcohol price reduces the consumption of alcohol by young people, with a greater impact on more frequent and heavier drinkers than on less frequent and lighter drinkers. This finding is supported by Hunt et al (2010) whose REA reports that most studies have found that young people, especially frequent drinkers and heavy drinkers, are more sensitive to changes in alcohol price than either older drinkers or infrequent and light drinkers. Additionally, there is strong evidence that young drinkers tend to choose cheaper alcoholic beverages (Booth et al, 2008).

## DIFFERENT INCOME GROUPS

There is very little evidence which assesses the impact that increasing alcohol price may have on different income groups. A Systematic Review (Booth et al, 2008) investigating the relationship between alcohol price and consumption found no evidence of the effects of price on low income groups, as they have not been studied specifically. Additionally, a recent REA (Hunt et al) which reported on the same link also identified that the evidence on the price responsiveness of those on low income is less extensive than for other priority population groups.

The existing evidence identified by Hunt et al (2010) suggests that people in low socio-economic groups may be more responsive to changes in alcohol price; with one study reporting that decreases in alcoholic beverage affordability led to greater decreases in alcohol consumption amongst low socio-economic groups than others (Sutton and Godfrey, 2006 quoted in Hunt et al, 2010).

More recently a paper, on purchasing patterns for low price alcohol, for Scottish Health Action on Alcohol Problems (Table 1.2) looked at the distribution by price and income of alcohol purchased from off sales using data from the Expenditure and Food Survey. The key findings reported:

- All income groups purchase low price off sales alcohol;
- The relationship between income group and the amount of alcohol purchased at the cheapest price (below 30p a unit) is not straightforward. Although the lowest income group buys more than the highest at this price, there is little difference between the middle income groups and the lowest;
- At prices of 30p to 40p and 40p to 50p the amount purchased tends to increase with income;
- Middle-to-higher income groups are the main purchasers of alcohol priced between 30p and 50p;
- For individual alcohol types (beer, lager, table wine and spirits), the lowest income groups purchase less than the average number of units below 30p and below 40p; and
- Low income households are less likely to purchase off sales alcohol at all.

[adapted from Ludbrook, 2010]

## KEY FINDINGS

- **The evidence revealed that increasing alcohol price may have distributional impacts on different population groups; however the impact on some of these population groups is under researched and some findings are mixed therefore it is not possible to draw firm conclusions. On balance, the research evidence reviewed tends to suggest that increasing alcohol price reduces heavy drinking. Some studies also suggest that heavy drinkers may be more affected by price increases than responsible moderate or occasional drinkers.**
- **The evidence highlights that binge drinkers, hazardous drinkers, harmful drinkers and younger drinkers tend to choose cheaper alcoholic beverages.**
- **There is a significant amount of research on the price sensitivity of young drinkers. The evidence reviewed supports the general principle that increasing alcohol price reduces alcohol consumption by young people, with a greater impact on more frequent and heavier drinkers.**
- **There was limited evidence around the impact of increasing alcohol price on different income groups. Findings are limited to two studies; one of which indicated that low**

**socio-economic groups may be more responsive to changes in alcohol affordability than others. Findings from the second study, examining purchasing patterns of alcohol, suggest all income groups purchased low price off sales alcohol, although low income groups were less likely to purchase off sales alcohol at all.**

## **2.4 THE LIKELY IMPACT OF INCREASING ALCOHOL PRICE ON COSTS AND BENEFITS TO BUSINESS**

Based on the evidence reviewed it is not possible to provide a robust answer to this research question, as evidence on how retailers and producers may be affected by policies designed to increase the price of alcoholic drinks is limited and is drawn primarily from only one preliminary research study. This research (Hunt et al, 2010) includes a Rapid Evidence Assessment, an analysis of secondary data and interviews with academics, producers and retailer representatives. It should be noted that any evidence drawn from Hunt et al's (2010) preliminary economic analysis should be treated with caution, as this study is limited in scale and can therefore only provide an indication of the way in which the UK alcohol market may react<sup>17</sup> (Hunt et al, 2010). Additionally, as wholesalers are not one of the groups analysed within this study, no evidence on the potential impacts of increasing alcohol price on wholesalers was found within the evidence reviewed.

Hunt et al's (2010) REA identifies that literature on the economic impacts of the mechanisms for increasing alcohol price via different alcohol pricing policies remains scarce and the quality and extent of the existing evidence for these policies varies widely. Hunt et al (2010) suggest that further analysis to estimate long run alcohol prices may help to understand long run economic implications in terms of employment, value for trade and government revenues. Additionally this same author suggests the process by which alcohol reaches the shelves of retailers is an area which is underdeveloped and further research on producer and consumer surplus associated with changes in alcohol price is needed.

Hunt et al (2010) suggest that any impacts which alcohol pricing policies may have on the alcohol market may be affected by market share, because if retailers have a higher concentration of the market, they may benefit more in terms of profits, or have fewer negative losses, than producers. Hunt et al (2010) also report that there are different implications on how retailers and producers may respond to increases in alcohol price depending on the market structure. Evidence drawn from Hunt et al's (2010) preliminary analysis of the UK alcohol market appears to indicate that major retailers of alcohol (supermarkets) have a relatively stronger bargaining position than producers of alcohol and will therefore be able to negotiate prices and volumes in their favour.

Tyagi (2001, quoted in Hunt et al, 2010) found evidence that producers may charge major retailers lower prices in order to pressure them to sell more products at a lower price, and suggests that if producers had not charged such low prices, major retailers would have sold fewer products but at a greater profit margin. Tyagi (2001, quoted in Hunt et al, 2010) argues that any such increased profit margins would not be passed on, thus harming producers' revenues. Interviews with the alcohol industry, undertaken in Hunt et al's (2010) research, support this view by suggesting that increased revenues may be possible with some pricing policies. Interviewees stated, that if these policies lead to increased profits, it would be difficult for producers to increase prices because a) major retailers would know that producer costs have not increased and b) due to the large volumes sold through these few major retailers, retailers know that producers will agree not to raise prices.

Hunt et al (2010) report that producers and supermarkets (and to some degree the on trade) may adopt strategies to avoid potential losses or to keep prices the same following the introduction of a pricing policy. However, for some policies, such as taxation, this may depend on whether

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<sup>17</sup> For more detail on these limitations please see Annex 2: Limitations and gaps in the research evidence base.

producers and retailers pass on the increase to consumers. If increases are passed on, producers or retailers may keep profit margins the same (or higher if they pass on higher increases), whereas if they do not pass on the increase they either accept smaller profit margins or try to employ these strategies to keep profit margins the same (Hunt et al, 2010). Hunt et al (2010) outline two main strategies which businesses may adopt:

- Non price competition - this involves strategies that are not related to adjusting prices to sell more products. The three main activities are advertising (where producers and retailers communicate the value of the product which can lead to more consumers or current consumers buying more); product differentiation (where producers try to separate their products through quality; and increasing barriers to entry (where producers have contracts with retailers for certain amounts of alcohol so they leave little shelf space and so make it unprofitable for another producer to try to enter the market).
- Acquisition of other firms - this is where producers and retailers may try to integrate or merge with other businesses (for example producers may try to own more of their supply-chain).

[adapted from Hunt et al, 2010]

Hunt et al (2010) did not locate evidence regarding how off trade or on trade retailers sell below cost or use a 'loss leader' strategy, although they acknowledge there is some evidence in this area – for example Chevalier et al's (2003a, quoted in Hunt et al, 2010) analysis suggests that retailers lower the price of particular products, which benefits the retailer because consumers purchase more of other products which remain at full price. Hunt et al (2010) also report that there is evidence that sales below cost are particularly common in UK supermarkets during periods of high demand such as Christmas and July.

Hunt et al (2010) highlight that the impact of increases in alcohol price on consumer welfare<sup>18</sup> is an issue that raises controversy in alcohol pricing policy debates. It is suggested that the question remains whether increases in consumer welfare through reduced alcohol harms offset reductions in consumer welfare (resulting from consumers having to pay higher prices or change their consumption after price increases) (Hunt et al, 2010).

## POTENTIAL COSTS OF PRICING POLICIES INCURRED BY BUSINESSES

Hunt et al (2010) suggest that there may be some small short run costs for retailers in implementing pricing policies, but implementation costs to producers appear to be limited.

Hunt et al (2010) outline two potential costs of implementing a minimum pricing policy. These are costs associated with altering display prices (which will be met by the retailer), although it is suggested that alcohol prices often change without the introduction of legislation so switching label costs are not specific to the implementation of policy. The other cost is that of storage, especially if a product is not allowed to go below a certain price and it prevents the product moving off the shelf (Hunt et al, 2010).

Cost implications of implementing a ban on sales below cost will depend on what 'cost' means (also whether this includes discount and promotional budgets etc) and whether or not this requires businesses to invest money to identify 'cost' (Hunt et al, 2010). Hunt et al (2010) suggests that costs may be incurred if there is a need to identify cost for every product. Hunt et al (2010) also suggests that this policy may be subject to the same costs (outlined above) for minimum pricing.

Implementing an increase in the rate of taxation would not incur any direct costs to producers, and for retailers any change in tax passed on to consumers may result in the same costs outlined for minimum pricing and a ban on sales below cost; that of altering display labels and storage

<sup>18</sup> Hunt et al (2010) report that the way in which consumer welfare is measured answers the question "How much change in income is necessary to offset a change in alcohol price so that a consumer's utility remains at a given level?"

(Hunt et al, 2010).

## KEY FINDINGS

**Based on the evidence reviewed it is not possible to provide a robust answer to how businesses may be affected by policies designed to increase the price of alcoholic drinks. Findings are limited and drawn from one small scale study, which can only provide an indication of the way in which the UK alcohol market may react. This one study found:**

- **Literature on the economic impacts of the mechanisms for increasing alcohol price, via different alcohol pricing policies, and the exact magnitude of effects of such policies remains scarce;**
- **The preliminary analysis of the UK alcohol market appears to indicate that major retailers of alcohol may be in a better position to negotiate prices and volumes in their favour;**
- **Policies which result in increased profits for major retailers may not be passed on to producers;**
- **Evidence that producers and supermarkets (and to some degree the on trade) may adopt strategies to avoid potential losses or to keep prices the same following an introduction of pricing policy;**
- **No evidence was located regarding how off trade or on trade retailers sell below cost or a use a 'loss leader' strategy, although it was acknowledged that there is evidence in this area;**
- **Potential costs incurred by retailers in implementing a pricing policy were suggested to be that of changing display labels and storage costs, with limited costs to producers; and**
- **Additional cost implications of implementing a ban on sales below cost would depend on what 'cost' means.**

### **3. CONCLUSION**

It is important to note that much of the evidence on which conclusions can be drawn come from a number key research documents (see chapter 1 for a complete list of these documents) rather than an exhaustive review of all available evidence. However, as discussed, the research studies reviewed encompass a number of recent Systematic Reviews and Rapid Evidence Assessments (REA) and so it is felt that the literature around alcohol pricing has been extensively covered.

Overall the evidence presented has shown that on balance increases in alcohol prices are linked to decreases in harms related to alcohol consumption. This suggests that policies designed to increase the price of alcohol may be effective in reducing alcohol harms. However, alcohol price is only one factor that may affect levels of alcohol consumption, with individual, cultural, situational and social factors also influential.

This review has highlighted that a number of potential impacts of policies designed to increase alcohol price are currently under researched. The evidence revealed that there is limited UK based evidence on alcohol pricing and criminal harm related to alcohol consumption. The evidence base for a link between alcohol pricing and crime is less comprehensive than that between alcohol price and consumption and alcohol price and health harms. Available evidence for a link between pricing and crime suggests that increases in alcohol prices tend to be associated with reductions in crime. However this relationship is not linear and the evidence base is not able to support a causal relationship between alcohol pricing and crime. For individual crime types rather than overall crime the evidence base for a link between alcohol price and violence is largest, with the balance of evidence tending to support a link. Although no firm conclusions can be drawn around links between alcohol pricing and other specific crime types due to limited and inconclusive evidence, this does not necessarily mean that increasing alcohol price does not impact on these particular types of crime but rather, indicates a lack of robust evidence to allow a judgement to be made.

The evidence supports an established association between alcohol consumption and many negative health outcomes and on balance the research literature finds that increases in alcohol prices are linked to decreases in health harms. The modest evidence presented on workplace productivity indicates a negative correlation with alcohol consumption (rather than price per se), with this available evidence not able to support any causal relationship.

Relatively little is known about the UK public's perceptions of increasing alcohol price. The evidence reviewed is limited to one market research study (involving a quantitative survey and qualitative focus groups). Findings drawn from this research suggest, that of those surveyed, there was more support for an increase in alcohol price if a link between cheap alcohol and levels of crime and anti-social behaviour could be proven. The focus groups reported an overall consensus not wanting to see an increase in alcohol prices. Conflict was also reported, with the belief that only large price increases would have an impact on crime but there was reluctance by focus group respondents to be subject to such a price increase.

There is also sparse evidence about the potential distributional impacts of increased alcohol price on specific population groups, such as the impact on different income groups or how policies will impact on the majority of responsible drinkers, with the body of evidence tending to focus on impacts on heavier drinkers. Additionally, some findings are mixed therefore it is difficult to draw any firm conclusions. On balance the evidence reviewed tends to suggest that increasing alcohol price reduces heavy drinking, with some studies showing heavy drinkers to be more affected by price increases than responsible moderate or occasional drinkers. The evidence supports the general principle that increasing alcohol price reduces alcohol consumption by

young people (with a greater impact on more frequent and heavier drinkers). The evidence also suggests that binge drinkers, hazardous drinkers, harmful drinkers and younger drinkers tend to choose cheaper alcoholic beverages.

Little is known about the impact of increasing alcohol price on different income groups, with the evidence reviewed limited to two studies; one of which indicates that low socio-economic groups may be more responsive to changes in alcohol affordability than others. Findings from the second study, examining purchasing patterns of alcohol, suggests that the relationship between income group and amount of alcohol purchased at the cheapest price is not straightforward and it reports that all income groups purchased low price off sales alcohol, although low income groups were less likely to purchase off sales alcohol at all.

Available research on the economic impacts of different alcohol pricing policies and the exact magnitude of effects which pricing policies may have is very limited. As such, on the basis of the evidence reviewed, it is not possible to determine which pricing policy may be most effective.

Evidence around how the alcohol industry may be affected by pricing policies is limited to findings from one small scale study, which only provides an indication of the way in which the UK alcohol market may react. Evidence from this study indicates that major retailers may benefit more from pricing policies than producers, and that both producers and supermarkets (and to some degree the on trade) may adopt strategies to avoid potential losses or to keep prices the same following an introduction of pricing policy. Understanding how businesses may react to pricing policy is of significant importance, as any strategies employed that prevent the increase of alcohol prices to affect consumers would clearly circumvent any potential impact on harms related to alcohol consumption.

# ANNEX 1

## DESCRIPTION OF TYPES OF EVIDENCE REVIEWED

Methodology used	Description of methodology
Systematic Review	This is a systematic method of summarising existing research evidence and it is defined in the Government Social Research (GSR) REA toolkit as “a broad review of existing research on a topic and synthesis of the evidence provided by these studies to answer the review question”.
Review of Reviews	This is a systematic method of summarising existing research evidence and is described in the GSR REA toolkit as as using the same methods as other systematic reviews, however it only includes already available reviews rather than individual studies.
Rapid Evidence Assessment	This is a systematic method of of summarising existing research evidence similar to a systematic review but certain limitations are put in place to speed up the process. It is defined in the GSR REA toolkit as a “quick overview of existing research on a (constrained) topic and a synthesis of the evidence provided by these studies to answer the Rapid Evidence Assessment question”.
Meta-Analysis	The Magenta Book for Policy Evaluation and Analysis describes meta-analysis as “a type of systematic review that aggregates the findings of comparable studies” which increases the robustness.
Economic Modelling	Economic modelling is “when economists make a number of simplified assumptions about how the economy, or some part of it, behaves, and then see what this implies in various different scenarios” (The Economist, adpated from Bishop).
Market Research	Market research is “the systematic gathering and interpretation of information about individuals or organisations using the statistical and analytical methods and techniques of the applied social sciences to gain insight or support decision making” (European Society for Opinion and Marketing Research (ESOMAR)).

## ANNEX 2

### LIMITATIONS AND GAPS IN THE RESEARCH EVIDENCE

This chapter considers some of the limitations which exist in the evidence reviewed for this paper. It also identifies, for some of the key research questions, where there is a lack of conclusive evidence available and where gaps exist in the evidence. It is important to recognise that inconclusive evidence or an absence of evidence does not necessarily mean that increasing alcohol price does not impact on harms related to alcohol consumption. Rather, this indicates that there is a lack of robust evidence to allow a judgement to be made either way.

### METHODOLOGICAL QUALITY

The studies which examine the impact of alcohol pricing fall into a number of types. Booth et al (2008) helpfully highlight two of these types of study:

- Econometric studies which look at co-existing trends between price and consumption or price and harm<sup>19</sup> ; and
- Natural experiments where actual changes to alcohol pricing or taxation has identified subsequent changes to patterns of consumption or harm. Evidence from these studies is strongest where they report on a control jurisdiction, ideally in the same country where prices or taxes have not changed.

[adapted from Booth et al, 2008]

In addition, other types of studies included within the evidence base reviewed in this report were cross-sectional studies measuring both alcohol price and related harm at a single point in time, and time series analyses measuring both alcohol price and related harm at repeated points in time (Booth et al, 2010).

Not all of these research designs, particularly for those studies examining crime outcomes, are robust enough to support a conclusive causal effect relationship. This is important, because the relationship between alcohol pricing and harms related to alcohol consumption is complex and a number of factors or influences may be affecting outcomes. Therefore without robust experimental design it is not possible to conclude which factor(s) is affecting outcomes or to prove any causality beyond correlation. However it would be very difficult to undertake robust experimental studies in the context of changing alcohol price, as any changes in price introduced through blanket legislation introduced across a country would impact across a whole population; thus it would be not possible to adopt controlled trials with comparison groups. To improve the evidence base work could be undertaken to improve the robustness of the assumptions used in modelling work and to ensure that more robust monitoring and evaluation is built into any future change in alcohol pricing policy.

Another factor for consideration is the quality assessment process undertaken for the research documents reviewed. For the Systematic Reviews and the REAs quality assessment processes have been applied to the studies included; however no studies appear to have been excluded on the grounds of methodologically quality alone and consequently there is considerable variation in quality across the studies analysed.

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<sup>19</sup> Economic modelling studies are not designed to establish a conclusive cause and effect relationship and findings from such studies are vulnerable to unidentified factors that affected the evidence and data underlying the model (Booth et al, 2010).

Two key pieces of research reviewed for this report comprise REAs. An REA is a systematic method for reviewing evidence that is completed in a shorter timescale than a Systematic Review. Due to the shortened timescales, exhaustive database searching, hand searching of journals, textbooks and searches of grey literature are not immediately undertaken and as a result there is an increased risk of publication bias<sup>20</sup> (Booth et al, 2010).

### LACK OF UK BASED EVIDENCE

Research into alcohol pricing and criminal harm has, in the main, been limited to economic modelling studies, as there has not been a one off increase in actual alcohol price or tax that could have been evaluated in the UK (Booth et al, 2010). As much of the international evidence base on alcohol pricing and harms related to alcohol consumption is not UK based, research has been undertaken in a different legal and cultural context. It is suggested that some of the inconsistent findings in the studies reviewed (Booth et al, 2010) and the differences shown in the estimates of size of the relationship between alcohol pricing, consumption and harms, may be attributed to these variations in cultural and policy contexts in the country where the research has been conducted (Hunt et al, 2010). This indicates that the degree of transferability of findings may vary depending on the country where the research was undertaken. In some instances there may be limits the extent to which the external validity of some of the research and studies analysed can be applied to the UK population and context.

### DEFINITIONS

The international literature on alcohol pricing and consumption uses a wide range of terms (including light, moderate, heavy, problem, binge, hazardous and harmful) to categorise different types of drinkers, with definitions of such terms varying (Hunt et al, 2010). Although the REA examining the potential impacts of alcohol pricing policy in the UK (Hunt et al, 2010) and the modelling study examining the potential impact of pricing and promotion policies for alcohol in England (Brennan et al, 2008) utilise the same definitions<sup>21</sup>, most authors seem to retain the terminology referenced within a particular study when they are reviewing research. This indicates that reviews of evidence may not be comparing like for like when summarising and collating evidence around alcohol pricing and harms related to alcohol consumption

### DATA SOURCES

Surveys are the main approach for assessing alcohol consumption in the population (Brennan et al, 2008). Thus it is important to acknowledge the limitations associated with these surveys. Stockwell et al (2007 quoted in Brennan et al, 2008) suggest that it is generally accepted that self reported data underestimates actual alcohol consumption by as much 50%. Heavy drinkers tend to underestimate drinking more than moderate drinkers (Townshend and Dukat 2002 quoted in Brennan et al, 2008). In addition, Brennan et al (2008) have highlighted the following potential biases of these surveys:

- Under sampling – household and school based surveys under represent some of the groups which drink most; and

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20 The Magenta Book for Policy Evaluation and Analysis suggests publication bias is “the tendency of some journals to overly publish findings from studies that report positive (or in some cases negative) results”.

21 These are *moderate* drinkers, i.e. an intake of alcohol less than likely to damage health and/or associated negative consequences (up to 21 units per week for men and 14 units for women), *hazardous* drinkers, i.e. drinkers with an increased risk of psychological and physical consequences due to alcohol intake (more than 21 to 50 units per week for men and more than 14 to 35 units for women) and *harmful* drinkers, i.e. drinkers with an intake that is likely to adversely affect health and/or have other negative health consequences (more than 50 units per week for men and more than 35 units per week for women) and *binge* drinkers, i.e. defined as individuals with an intake of more than twice the recommended daily limit (i.e. more than 8 units for men and 6 units per day for women) (Hunt et al, 2010).

- When asked about typical drinking, people do not take into account heavy drinking occasions (Goddard, 2007; Stockwell et al, 2004 both quoted in Brennan et al, 2008).

[adapted from Brennan et al, 2008]

## **ADDITIONAL LIMITATIONS SPECIFIC TO KEY PIECES OF RESEARCH REVIEWED**

The paper examining the purchasing patterns for low price off sales alcohol draws on evidence from the Expenditure and Food Survey (EFS). As the EFS does not include data on alcohol consumption, the findings from this paper only reflect alcohol purchased in a two week reference period not the actual amount of alcohol consumed. Additionally, a limitation identified with the EFS is that there is a low response rate of about 55% of approached households, with potentially important differences by age, social class and educational status (Dunn, 2008 quoted in Brennan et al, 2008).

The quantitative aspect of the market research on public perceptions of alcohol pricing is based on quota sampling. As this sampling method is not based upon random selection, responses cannot be assumed to be representative of the views of the wider population from which the sample was drawn.

The preliminary economic analysis (Hunt et al, 2010), examining the potential impacts of alcohol pricing policy in the UK, is limited in scale and can therefore only provides an indication of the way in which the UK alcohol market may react to these policies (Hunt et al, 2010). The authors suggest that for a number of economic impacts of interest the data is simply not sufficient to arrive at definitive conclusions with much certainty. Their view in light of such limitations is that this study cannot answer policy questions such as whether one policy may be more desirable or suitable than the others (Hunt et al, 2010). It also concludes that the complexity of the alcohol supply chain and the long term implications of the pricing policies are inadequately researched and therefore advises that the main findings should be interpreted with caution.

## **UNIVERSITY OF SHEFFIELD SCHOOL OF HEALTH RELATED RESEARCH (SCHARR) MODEL**

The modelling study on the potential impact of pricing for alcohol in England (Brennan et al, 2008) reports that many of the risk estimates used were based on non UK research, as UK based research was not available, lacked the necessary detail or was not available for the age and gender groups modelled. This University of Sheffield School of Health Related Research (SchHARR) model provides a big step forward in improving the evidence base on the link between alcohol price and potential social benefits. However, there are limitations to this model, some of which are simply due to the fact that the model was not designed specifically for this purpose. This model employs a methodology built around two concepts:

- Alcohol Attributable Fractions (AAF): The proportion of the harm attributable to alcohol; and
- Relative Risk (RR): The risk that a person exposed to a certain degree of alcohol will experience/cause a particular harm relative to a person not exposed to alcohol.

The two can be used to produce a linear equation for each type of harm showing how the risk of causing/experiencing that harm increases as alcohol consumption increases. The extent to which this methodology is appropriate for health, crime and employment effects is discussed below.

Generally, the evidence for the health methodology is good. A considerable body of research links the consumption of alcohol to a whole range of health harms in a linear fashion. This literature frequently utilises the AAF/RR techniques described above. Thus, the outcomes from this arm of the model look to be well supported by the evidence.

There are several issues with the above methodology when applied to crime harms. Firstly, as the ScHARR team recognise, evidence suggests that the link between crime and alcohol is not as simple as a linear relationship would suggest. To say the more a person drinks, the more crime they are likely to cause is not supported by evidence. Indeed, anecdotally, minor violence (the most common alcohol-related crime) is more associated with binge drinking than dependent drinking. To try and account for this, the ScHARR team model a 'binge function' that is linked to overall consumption. That is, given how much a person drinks in a week, they find the average of how much that person would drink on the heaviest day; this is counted as the binge and is modelled in relation to crime. This approach is as good as it can be given the current lack of evidence on the links between crime and drinking patterns, but is imperfect.

In addition, the linearity assumption remains a problem. Even though it refers to the binge rather than total consumption, it seems unlikely that the propensity for crime would simply carry on increasing in a linear fashion the more a person drank. That makes it very important at which point on the curve the consumption shift occurs. If the downward movement in consumption occurs at a point on the curve where it has already plateaued, the crime effect may be far smaller than predicted by the model.

Finally, the AAF is created using the Offending & Criminal Justice Survey from 2005. Apart from being dated, this may also introduce two other biases. Firstly, it is slightly unclear whether the question used relates to alcohol alone or drugs and alcohol (which would obviously give a higher AAF as some crimes may be attributable to being influenced by drugs alone.) Secondly, it ignores the link between alcohol and victimisation. A person under the influence of alcohol may be a more susceptible target for robbery, for example.

The employment methodology is built on very limited evidence. For estimates of alcohol-caused absenteeism, the authors rely heavily on a single paper from Australia (Roche et al, 2008); while the employment effects are also based on just one study (Macdonald & Shields, 2004), though it is from the UK.

The linearity assumption is problematic here as well, especially for the latter paper, as, although it controls for the endogeneity between alcohol consumption and unemployment it is unclear whether this is justified. Put simply, if problem drinking can simply be classified by the amount you drink, then the ScHARR approach may be suitable, provided the consumption change shifts a person from one category (problem drinker) to the other (non problem drinker); if it's more to do with psychological factors like the degree to which the person feels addicted, then the approach is less valid.

Finally, there is also concern over the salary which the model predicts a person returning to work will receive. The Sheffield team has used average salary levels to calculate these potential benefits. This may lead to an overstatement of the benefit if high levels of alcohol consumption are more prevalent amongst low-income groups (CEBR, 2010).

Whilst the methodology for measuring the health impacts is based on a great deal of high quality evidence the same cannot be said for the crime and, to a greater extent, the employment aspects of the model. As such the results in these areas should be treated more cautiously.

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