R&S

EVALUATING ALTERNATIVES TO SUPPORT SOCIAL MARKETING: A FRAMEWORK FOR ALCOHOL CONTROL POLICY DEVELOPMENT

Jaco van Tonder *(Stellenbosch University, South Africa)*
Frikkie J. Herbst *(Stellenbosch University, South Africa)*
Marlize Terblanche-Smit *(Stellenbosch University, South Africa)* ✉

Abstract:

Even when the harmful consumption of alcohol causes nearly 4% of deaths globally, the fight against alcohol abuse remains a low priority in public policy. To address the rising alcohol abuse problem in South Africa, several control policies are under review, one being a proposed ban on alcohol advertising.

The purpose of this study is to evaluate alternative policies to address alcohol abuse and support social marketing campaigns. At this purpose, data from several countries were analysed and a policy strength framework was developed. The findings indicate that alcohol control policies which influence the availability and affordability of alcohol are most effective in reducing per capita consumption and related harm.

Keywords: *social marketing*; *alcohol abuse*; *alcohol advertising*; *alcohol control policies*

EVALUANDO ALTERNATIVAS PARA APOYAR EL MARKETING SOCIAL: UN MARCO PARA EL DESARROLLO DE POLÍTICAS DE CONTROL DEL ALCOHOL

Resumen:

Aun cuando el consumo nocivo de alcohol provoca casi el4% de las muertes a nivel mundial, la lucha contra el abuso del alcohol sigue teniendo una baja prioridad en las políticas públicas. Para afrontar el creciente problema del abuso del alcohol en Sudáfrica, se están revisando varias políticas de control, una de las cuales es la propuesta de prohibir la publicidad del alcohol.

El propósito de este estudio es evaluar políticas alternativas para abordar el abuso del alcohol y apoyar las campañas de marketing social. Para ello se analizaron datos de varios países y se desarrolló un marco de fuerza política. Los resultados indican que las políticas de control del alcohol que influyen en la disponibilidad y asequibilidad del alcohol son las más efectivas para reducir el consumo per cápita y los daños relacionados.

Palabras clave: *marketing social*; *abuso del alcohol*; *publicidad sobre el alcohol*; *políticas de control del alcohol*

✉ Stellenbosch University Business School (Stellenbosch University), Carl Cronjé Drive   7530-Bellville, Cape Town (South Africa)
e-mail: *marlize.terblanche-smit@usb.ac.za*

1. Introduction

Alcohol abuse is a significant inhibitor to socio-economic development and the third leading risk factor for poor health globally, contributing at world levels to more than 2.5 million deaths a year (World Health Organization 2011). In South Africa 130 people die per day as a result of alcohol-related causes and it places an immense burden upon the health care sector (Parry et al. 2012). The annual economic impact attributed to alcohol abuse has risen from €579 million in 2009 to €789 million in 2011 (Department of Trade and Industry 2012) and the World Health Organization has identified South Africa as one of five countries which is most at risk due to problematic alcohol consumption trends and drinking patterns.

Several alcohol control policies are under review to address the rising alcohol abuse problem. One of these, a proposed ban on alcohol advertising, has proven controversial. Alcohol advertising is a substantial source of revenue for the advertising industry and an advertising ban is projected to cost the economy €228 million, placing 2500 jobs in jeopardy (Nevill 2012). Alcohol control measures are effective to restrict alcohol use and availability, but only to the extent that they affect consumer behaviour about alcohol abuse (Cook and Moore 2002).

On this basis, the purpose of this exploratory study was to evaluate alternative alcohol control policies and identify more effective policies in addressing the problem of alcohol abuse within South Africa. Ideally these alternative alcohol control policies can then be used to support social marketing campaigns to change consumers' alcohol abuse behaviour.

Secondary data were utilized as overall research design. A longitudinal mixed method was employed for data collection and analysis due to the use of both qualitative and quantitative time-series data. Data from several countries were analyzed in order to identify effective global best practices in reducing the harmful effects of alcohol abuse. A policy framework was then developed to assess the relative strength of alcohol policy within South Africa as compared to global benchmarks. Based on the framework, several variables were chosen to measure the impact of increased disposable income on alcohol consumption, to identify whether increased alcohol consumption had an effect on alcohol related harm, and to ascertain whether certain alcohol control measures (i.e. banning branded alcohol advertising and price increases) were effective in reducing alcohol abuse within the South African context.

The focus of the findings of the study was on providing a reference framework for local stakeholders to develop a balanced approach in developing alcohol control policies and in dealing with alcohol-related problems.

2. Theoretical background

According to the World Health Organization (WHO 2011), alcohol is the third leading risk factor for poor health and one of the four most common preventable risk factors for major non-communicable diseases. In addition to this, alcohol also plays a major part in contributing to the health burden caused by communicable diseases such as HIV/AIDS and tuberculosis. Despite the severity of the situation, alcohol abuse and the harmful use of alcohol remains a low priority in public policy throughout the world. What makes it more worrying is the greater vulnerability that children and adolescents have to the harmful effects of alcohol. Persons with higher consumption patterns in their mid-teens tend to show heavier consumption, alcohol dependence and alcohol-related harm, including poorer mental health and increased risk of crime in early adulthood (Anderson 2009, p. 121).

Another worrying trend and burden associated with the harmful use of alcohol is the social burden that alcohol abuse places on the developing world. Although the highest per capita consumption levels are generally found in the developed world –particularly Western and Eastern Europe–, poorer countries experience disproportionately high levels of harm related to alcohol. These poorer countries are also less able to effectively deal with the social and economic burden placed on them. It is in this context that the WHO developed its global strategy to reduce the harmful use of alcohol in 2010, so acknowledging the link between limiting the harmful use of alcohol and socioeconomic development (WHO 2011).

The trend in South Africa is particularly worrying. Although this country has one of the highest levels of abstinence globally (72.7% of drinkers are adults over the legal age of eighteen), the country falls within the highest categories of harmful drinking patterns and heavy episodic drinking (Peltzer et al. 2011). Heavy episodic drinking is commonly referred to as binge drinking, consuming more than five units of alcohol during a single occasion. South Africa also has one of the highest absolute alcohol consumption

levels per capita in the world, namely 35.1 litres a year (controlled for abstinence). This means that although very few people actually do drink alcohol, many of the people who choose to drink, do so in an unhealthy and harmful way. The resulting economic and social costs are very high, being estimated at €579 million in 2009 with 6.3% of all years of life lost through dying prematurely attributed to alcohol abuse causes. This cost is significant when compared to the estimated €176 million spent on commercial alcohol marketing in South Africa during the same period (DTI 2012; Nevill 2012; Parry et al. 2012).

It is within this context that the South African government has decided to investigate new legislation and the tightening of regulations. Over and above instituting various programmes to curb the problem of alcohol abuse in South Africa, the government has also proposed a complete ban on all forms of alcohol advertising and sponsorship (DTI 2012). The government's proposal has sparked debate surrounding the government's alcohol strategy and the proposed new bill to ban alcohol advertising presented to parliament. Opponents of the ban include advertising agencies, mass media companies and alcoholic beverage distributors who believe that any such restrictions would have a significant economic impact and lead to substantial job losses. It is estimated that the direct economic impact will be €228 million a year with as many as 2500 direct job losses initially (Nevill 2012). Additionally, researches in countries including Canada, Denmark and New Zealand indicated no increase in alcohol abuse after lengthy advertising bans were lifted. The degree to which advertising influences alcohol consumption has been studied with widely varying results in the past (Ambler 2009). Most studies measured the effect of advertising expenditure and advertising bans on consumption. These studies can loosely be grouped into two distinct groups with varying results: in studies that used aggregated national expenditures as the advertising variable, little evidence was found that advertising increased overall population level consumption of alcohol; however, studies that used cross-sectional advertising data found evidence of an effect on consumption (Saffer and Dhaval 2002).

It is clear that alcohol abuse is a significant problem in South Africa. Overall various other interventions and control measures have proven more effective in reducing alcohol abuse than advertising restrictions. Social marketing campaigns, if implemented in the right way, can effectively reduce the levels of alcohol abuse by changing consumption behaviour. Targeted interventions aimed at reducing the consequences associated with alcohol abuse can be effective. An example of targeted interventions utilized are drunk-driving policies which, when effectively enforced, can be successful in reducing the harm associated with alcohol abuse (Prince and Du Plessis 2011). Other targeted interventions aimed at reducing alcohol abuse include educational initiatives (i.e. alcohol education in schools, parenting education programmes, public awareness and information campaigns), anti-abuse policies (i.e. warning labels and health warnings, and counter anti-abuse advertising) and treatment for affected individuals (Parry et al. 2008).

Nevertheless, the annual road traffic fatality burden of 43 deaths per 100,000 population in South Africa remains very high compared to the world average of 22 deaths per 100,000 population (Sukhai et al. 2011). Even when under the South African Road Traffic Act 93/1996 that regulates drunk driving –which has been in effect since 1998– the legal blood alcohol limit is less than 0.05 g per 100 ml of blood (Parry and Dewing 2006), the World Health Organisation reported that 60% of all road traffic fatalities in the country involved alcohol. According to some statistics, 50% of people who die on South African roads have a BAC level of 0.05 g/100 ml or higher, thus above the legal limit (Arrive Alive 2012). Alcohol-related driving impairment increases significantly as blood alcohol content (BAC) levels increase, with 53% of all transport-related fatalities, including cyclists and pedestrians, in South Africa having a high BAC. Pedestrians were the most intoxicated with 61% testing positive for alcohol in their blood, with a mean of 0.22 g/100 ml. Amongst cyclists, 40% tested positive and 58% of drivers tested positive with a mean of 0.18 g/100ml, nearly four times the legally allowed limit (Matzopoulos 2005).

Whilst the reduction of the current BAC would be a good policy to consider in the future, efforts should rather be spent on effectively enforcing the current limit (Parry et al. 2008). The South African Department of Transport launched the *Arrive Alive* social marketing campaign during 1997 as an initiative to reduce deaths on roads. The main aim of *Arrive Alive* was the promotion of road safety and it became an important part of the Road Traffic Safety Projects of the Department of Transport. However, the continued high death toll on South African roads lead to an increased pressure on the Department of Transport, amidst allegations of failure of the *Arrive Alive* campaign (Matzopoulos 2005; Arrive Alive 2012). As new data are available, it has become evident that much more than this campaign is required for road safety in South Africa.

Consequently South African corporations and individuals have decided to assist with their own "road safety initiatives". The alcohol industry contributed an estimated R94 billion[1] to the Gross Domestic Product of South Africa in 2009, representing 4.4% of GDP total amount. Apart from the significant socio-economic impact the liquor industry has on South Africa, many of the companies operating within this sector are responsible corporate citizens, investing not just in programmes aimed at reducing alcohol abuse, but also in other community building and uplifting programmes, outside of the scope of their business (ARA 2011). *South African Breweries* (SAB) spends an estimated R90 million annually aiming to reduce alcohol abuse. SAB also spends around R21 million on enterprise development programmes, such as the SAB *KickStart* programme, aimed at supporting young entrepreneurs with small business development and grant funding. SAB is serious about tackling the problem of alcohol abuse and building a better society for all its citizens, often working closely with several government departments and non-governmental organisation (SAB 2010). Other corporate companies in the liquor industry also launched initiatives to address alcohol abuse. *Distell*, a major liquor company, launched key initiatives and projects related to combating alcohol abuse, these include addressing underage drinking, violence and road injuries (DNA Economics 2011). Another major liquor company, *Brandhouse*, also implemented alcohol abuse and drunk-driving projects related to combating alcohol abuse. These projects include: a *Drive Dry* advertising campaign. (a series of fear appeal commercials aimed at reducing drunken driving within South Africa, based on research into the problem); the *Number One Taxi Driver Competition* (a programme aimed at improving road safety by educating taxi drivers and other professional drivers to be responsible road users); a Jonny Walker *"Join the Pact"* programme (a local programme which forms part of *Diageo*'s international awareness campaign, where consumers sign a pledge not to drink and drive); an underage drinking programme aimed at grade 8-12 learners; *Drink IQ*, a global website created by *Diageo* which provides information about alcohol, its harm and tips on how to consume alcohol responsibly (DNA Economics 2011). The Association for Responsible Alcohol Use (ARA) is a non-profit organisation, which aims to reduce the levels of alcohol-attributed harm in South Africa, by combating the abuse of alcohol and promoting its responsible use (ARA 2011). It was founded in 1989, in a joint effort by the major liquor companies in South Africa to combat rising levels of alcohol abuse and its initiatives include social responsibility programmes and social marketing. Table 1 gives an overview of the major industry initiatives by target area in 2010.

Table 1. Overview of liquor industry anti-abuse programmes (2010)

Program target	Number of projects	% of all programs (%)
Road injuries	8	19%
General	(1)	(2%)
Drunk driving	(6)	(14%)
Pedestrians	(1)	(2%)
Under-age drinking & child-oriented interventions	6	14%
Alcohol abuse	4	10%
Violence	6	14%
FAS	5	12%
Advertising	4	10%
Responsible trader/server components	3	7%
HIV	1	2%
Mental illness	1	2%
Insufficient information provided	4	10%
Total	42	100%

Source: DNA Economics (2011)

---

[1] South African Rand (R) is the currency of South Africa. At the time of publishing this paper (September 2013) the exchange rate with US$ was around 0.10 (1 R = 0.10 US$) and 0.07 with Euro (1 R = 0.07 €).

A criticism raised against some of the social responsibility and social marketing initiatives is that many of them are not aligned to or based on global programmes, which have proven to be effective. The performance of the programmes intended to address drinking and driving and Foetal Alcohol Syndrome (FAS) has proven to be more effective than programmes directed towards other preventative areas, such as those aimed at underage drinking and violence. Additional criticism of these programmes are that they do not adequately address all the impact areas associated with the harmful use of alcohol and most programmes are not evidence based or evaluated (DNA Economics 2011).

Self-regulation is an option, but in South Africa it has proven to be ineffective due to the fragmented nature of the alcoholic market. Whereas large players in the market adhere to a strict code of ethics, as prescribed by the ARA (2012), there are many smaller players in the market that do not prescribe or comply with any code of responsible practice. The abuse of alcohol places a considerable burden on society and alcohol policies and legislative measures aim to reduce this burden and limit the heavy use and abuse –not the moderate use– of alcohol. Alcohol policies have been defined as sets of measures aimed at reducing the health and social harms from the abuse of alcohol to a minimum. Research about the effectiveness of alcohol reduction policies has almost exclusively been done in predominantly Western, high-income societies. Alcohol consumption and associated abuse are sharply increasing in low-income Southeast Asian countries as a result of social and economic development in recent years. Abstinence levels in Southeast Asian countries have traditionally been high. This is a worrying trend for South Africa, who also has historically high abstinence levels and a rapidly increasing disposable income mirroring countries such as Vietnam and Thailand.

Although most research into alcohol policies and strategies has been done in high-income countries, the principles are fairly well understood and often applicable across societies. A conceptual framework suggests that findings from one society will be applicable in another (Anderson et al. 2009). In the United States of America (USA), the extent of government involvement in policy has varied over time, ranging from the extremes of Prohibition in the 1920s to laws that are more liberal in the 1980s. Currently, every state has a wide array of alcohol control policies in place, including excise taxes, minimum age of purchase, licensing systems and penalties for driving under the influence of alcohol to name but a few (Cook and Moore 2002).

From the repertoire of policies that have been implemented internationally and evaluated, the policies that increase price are considered the most effective in reducing alcohol consumption (Anderson et al. 2009; Carragher and Chalmers 2011). This is based on consistent findings that population level alcohol consumption is inversely related to alcohol prices (Babor et al. 2010). There is a well-established association between population level alcohol consumption and individual level alcohol consumption and mortality (Wagenaar et al. 2010) and an increase in price decreases consumption and alcohol-related problems substantially, especially amongst younger consumers (Osterberg 2004). An increase in alcohol pricing, either through minimum price setting or alcohol taxation is the most effective measure in reducing alcohol consumption (Chaloupka et al. 2002). Excise taxes and pricing policies affect the perceived value consumers receive from the product and consumers have proven to be price sensitive to increases in alcohol pricing (Cooke and Moore 2002). A meta-analysis conducted by Wagenaar et al. (2010) found that a doubling of the alcohol tax in the USA would reduce overall alcohol-related mortality by 35% and traffic accidents by 11%.

As most of the studies into alcohol control measures recommend an increase in taxation and pricing, the question needs to be asked: *how high should these taxes be set to address the issue of alcohol abuse?* Cook and Moore (2002) argue that the taxes should be sufficient to pay adequately for all the external costs associated with the consumption of alcohol, without placing a burden on non-consumers. In the United Kingdom, alcohol has become increasingly affordable due to relatively static excise tax rates, higher levels of disposable household income and heavy discounting in the off-premise. The increased affordability has been mirrored by a rise in consumption and a corresponding upward trend in alcohol-related harm. Particularly concerning is the increase in alcohol abuse amongst younger consumers and age groups (BMA 2012).

Other measures that have proven effective in controlling alcohol abuse relate to measures restricting the availability of alcohol, either through the setting of a minimum age of purchase, restricting the hours of trade or licensing requirements (Cook and Moore 2002). The restriction of the number of distribution outlets through measures such as compulsory licenses has also proven effective in controlling alcohol abuse (Osterberg 2004).

Additional measures that have also been proven to be effective in reducing the harm caused by alcohol abuse includes measures to manage the drinking environment such as bar staff training programmes, on-premise outlet enforcement policies, and regulations against selling to intoxicated patrons, as opposed to relying on voluntary codes and in-house policies alone. Legislation alone does not restrict the availability of alcohol. Cultural and societal norms, religious persuasion as well as restrictions by private organisations such as sports clubs, stadiums and parks all limit the use and availability of alcohol (Babor et al. 2010).

Alcohol control measures are effective only to the extent that they affect consumers' behaviour about excessive drinking (Cook and Moore 2002). Subsequently, it could also be argued that marketers could and should play a pivotal role in influencing consumer behaviour to reduce alcohol-related harm.

3. Rationale of the study

As discussed in the theoretical background, various alternatives are available and can be adopted to deal with the problem of alcohol abuse. Alcohol control policies and social marketing campaigns can be utilised to change alcohol abuse behaviour.

In South Africa 130 people die daily as a result of alcohol-related causes and it places an immense burden upon the health care sector (Parry et al. 2012). To curb alcohol abuse in South Africa, the government has proposed several measures including a controversial bill to ban all forms of branded alcohol advertising and marketing, although there is also considerable debate regarding the effectiveness and impact of branded advertising on absolute consumption levels (Nevill 2012).

In this sense, the main objective of the conducted research was to identify the most effective policy measures in addressing the problem of alcohol abuse. The study aimed to provide a reference framework for future policy development and the provision of guidelines in line with global best operating practices. Based on the framework, several variables were chosen to measure the impact of increased disposable income on alcohol consumption, namely:

i) to identify whether increased alcohol consumption had an effect on alcohol related harm; and

ii) to ascertain whether certain alcohol control measures (i.e. banning branded alcohol advertising and price increases) were effective in reducing alcohol abuse within a South African context.

Based on the measurement of these variables the aim of the study was to indicate effective alcohol control policy measures that can be adopted in dealing with the problem of alcohol abuse. It is clear that ultimately these policies could also support social marketing campaigns that aim to change alcohol abuse behaviour.

The following hypotheses were developed for this study:

Per capita consumption as a function of income

$H_0: \beta_1 = 0$ Increased income has no effect on per capita alcohol consumption

$H_1: \beta_1 \neq 0$ Increased income has a positive effect on per capita alcohol consumption

Alcohol related harm as a function of per capita consumption

$H_0: \beta_2 = 0$ Increased per capita alcohol consumption has no effect on alcohol abuse

$H_2: \beta_2 \neq 0$ Increased per capita alcohol consumption has a positive effect on alcohol abuse

Alcohol advertising has an effect on alcohol consumption.

$H_0: \beta_3 = 0$ Alcohol advertising has no effect on alcohol consumption

$H_3: \beta_3 \neq 0$ Alcohol advertising has a positive effect on alcohol consumption

Pricing has an effect on alcohol consumption

$H_0: \beta_4 = 0$ Pricing has no effect on alcohol consumption

$H_4: \beta_4 \neq 0$ Pricing has a positive effect on alcohol consumption

4. Research methodology

As previously mentioned, the character of the study was exploratory and it was aimed at gaining insights into the problem of addressing alcohol abuse within a South African context. Secondary data analysis as overall research design was preferred over pure statistical meta-analysis due to the high degree of variability in the data sources and areas of interest as well as the potential bias of previous research into the effectiveness of branded alcohol advertising. Additionally, the availability of substantial and accurate data sources and the amount of research done on the subject of addressing alcohol abuse globally made it a logical and cost effective choice of design.

4.1 Data collection

A longitudinal mixed method research approach was employed for data collection and analysis due to the use of both qualitative and quantitative time-series data (Saunders et al. 2007, p. 145). Data were collected from various secondary qualitative and quantitative sources. The primary data source for the longitudinal and quantitative, country-specific data was the World Health Organisation, namely the Global Information System on Alcohol and Health (GISAH). Other data sources included the National Alliance for Action on Alcohol (NAAA), the Association for Responsible Alcohol Use (ARA) and econometric data from the comprehensive database of the Organisation for Economic Co-operation and Development (OECD).

Multiple secondary data sources were also used, including books, cited articles, scientific and scholastic journals, published research reports, government publications, internal company reports and internet websites. As the environment and subject under investigation is so dynamic, data sources were limited, where possible, to publications less than five years old.

4.2 Data analysis

For the purpose of this study simple linear regression analysis and multiple regression analysis were used as the preferred statistical inference techniques where after the models were assessed, either through *t*-tests in the case of simple linear regression and *F*-tests in the case of multiple regression. Taking in mind the intended objectives, an assumption was made that all the variables under investigation had some form of a linear relationship towards each other, and the study only aimed to prove that a relationship exists. The following sets of variables were analysed:

- Per capita consumption as a function of income and alcohol control policies.

- Alcohol related harm as a function of per capita consumption and drinking patterns.

- The effect of advertising on alcohol consumption.

- The effect of pricing on alcohol consumption.

The abovementioned variables were chosen:

i) to measure the impact of increased disposable income on alcohol consumption;

ii) to identify whether increased alcohol consumption had an effect on alcohol related harm; and

iii) to ascertain whether certain alcohol control measures (banning alcohol advertising and price increases) were effective in reducing alcohol abuse.

A policy effectiveness framework was developed based on empirical data and evidence from prior studies (various alcohol control policies were rated in terms of their effectiveness and cost to implement, on the basis of globally observed results). Each alcohol policy intervention was assigned a weight according to its effectiveness and an alcohol policy index score was calculated by country. The policy framework was then used to develop an *Alcohol Policy Index* (API) formula, as shown in Table 2, which provided a comparative alcohol policy effectiveness score by country.

The comparative alcohol policy scores allowed comparisons to be drawn between the effectiveness and comprehensiveness of alcohol policies within a given policy category or country. By comparing the South African category scores to international benchmarks, distinct policy improvement opportunities were identified. These specifically identified opportunity areas formed the basis for the research.

Table 2. Alcohol policy index scores (%) in OECD countries in 2012

Country	Advertising bans	Availability policies	Drin-driving policies	Pricing and taxation	Alcohol policy index (%)
Norway	7	24	32	32	81.0%
Russian Fed.	3	24	24	24	73.5%
Australia	3.5	10	34	34	70.0%
Iceland	5.5	28	18	18	69.5%
Sweden	7	18	24	24	67.0%
France	5	22	20	20	65.0%
Hungary	4	10	38	38	61.0%
Finland	3.5	14	22	22	57.5%
Netherlands	3.5	16	24	24	57.0%
Ireland	3.5	18	12	12	56.0%
Israel	2.5	10	28	28	54.0%
Slovakia	2	4	34	34	53.5%
United Kingdom	3.5	14	8	8	52.5%
New Zealand	0	14	20	20	52.0%
Canada	3	4	18	18	52.0%
Czech Republic	0	4	34	34	51.5%
South Africa	0	14	24	24	51.5%
Poland	3.5	10	24	24	51.0%
Mexico	2.5	18	16	16	50.0%
China	1	6	28	28	48.5%
Republic of Korea	1	12	22	22	48.5%
Austria	0	2	34	34	45.0%
Japan	0	6	24	24	43.5%
Denmark	3	8	18	18	42.5%
Germany	3	2	24	24	42.5%
Belgium	0	6	22	22	41.5%
Italy	3.5	6	22	22	40.5%
Portugal	1.5	8	22	22	40.5%
Spain	3	2	26	26	40.0%
Indonesia	6	20	0	0	39.5%
Switzerland	6	2	22	22	39.0%
Chile	0	10	14	14	37.5%
USA	1.5	10	18	18	34.0%
Luxembourg	0	6	22	22	28.0%
Greece	0	0	22	22	22.0%

Source: own elaboration based on OECD and GISAH data

Based on the Alcohol Policy Index (API) score of 51.5%, it is evident that South Africa has room to improve in terms of overall alcohol policy, especially when measured against the Russian Federation (API = 73.5%), which has a similar alcohol harm profile. The specific policy areas where South Africa falls short in terms of international benchmarks were identified, using the descriptive statistics of the policy intervention categories. The policy intervention categories were advertising bans, availability policies, drink-driving policies and pricing and taxation.

Based on the API score, South Africa scored 14, which when compared to the descriptive statistics for the availability policies category, is slightly higher than the average of 10.9, although it is quite some distance from the benchmark score of 28 (Finland). The Russian Federation scored 24 in this category, with a similar alcohol risk profile to South Africa. This category is a definite category in which alcohol policy can be tightened.

Based on the API score of 13.5, South African alcohol pricing policy is fairly weak when compared to the other countries. The average score is 14, which means the South African score is below the sample mean for this policy. The United Kingdom and Canada both scored 27, with comprehensive pricing policies in place, including minimum pricing. The Russian Federation scored 22.5 in this policy category. This policy category offers the biggest opportunity for improvement.

Although South Africa is perceived to have strong drinking-driving policies in place, it scored surprisingly low on the API in this category. With an API score of 24, it compares favourably with the Russian Federation, which also scores 24, and scores slightly above the sample mean of 22.7. The highest scores are found in Hungary (38) and Australia (34), which has recently reduced their legal BAC levels. Given the high alcohol related accident rate in South Africa, this policy option is worth exploring.

5. Major findings

The analyses of the data lead to the following findings regarding the research objectives and hypotheses. The findings deal with per capita consumption, the drivers of alcohol consumption and the link to alcohol attributed harm within society. Thereafter the effect of alcohol advertising on per capita consumption was investigated. Finally the effect of pricing on alcohol consumption was determined.

5.1 Per capita consumption as a function of income

By controlling for alcohol policy changes only, the six countries whose alcohol policies remained constant during the last two decades were considered using simple linear regression analysis based on a straight linear relationship depicted by the formula:

$$PCC = \beta_0 + \beta_1 (PPP) + \beta_2 \Delta P + \varepsilon \qquad [1]$$

where,
 PCC is the per capita alcohol consumption in litres of pure alcohol per year;
 PPP is the purchasing power parity in US$ as a function of per capita GDP;
 ΔP is the change in alcohol policy (change in alcohol policy index strength over time);
 β_0, β_1 and β_2 are coefficients; and
 ε is the error variable.

A summary on obtained values for regression statistics is shown in Table 3.

Table 3. Summary output regression statistics considering per capita consumption of alcohol as a function of income

Statistic/measure	Value
Multiple R	0.8764
R Square	0.7681
Adjusted R square	0.7101
Standard error	0.0833
Observations	6

As the value of the test statistic t is $t = 3.64$, which falls outside the test parameter of $t = 2.4$ and the p-value is $p = 0.02$, there is strong evidence to reject the null hypothesis and infer that a linear relationship exists. The result is thus deemed significant. The relationship is strong due to the relative size of the standard error (0.08) when compared to the sample mean (33.8), inferring a strong linear relationship.

According to this model, 76.8% of the percentage change in per capita consumption is explained by the percentage change in income. The remaining 23.2% is explained by other variables. Then, it can be inferred that an increase in income will lead to an increase in total per capita alcohol consumption, when controlled for other variables.

5.2 Alcohol-related harm as a function of per capita consumption

The relationship between the levels of alcohol-related harm within society was tested as a function of per capita alcohol consumption and the patterns of drinking, through multiple regression analysis based on a linear relationship that is depicted by the following formula:

$$ARH = \beta_0 + \beta_1 (PCC) + \beta_2 (PDS) + \beta_3 (HED) + \varepsilon \qquad [2]$$

where,
   ARH is the alcohol-related harm (DALYs per 100 000 population);
   PCC is the per capita alcohol consumption in litres of pure alcohol per year;
   PDS is the pattern of drinking score as per WHO classifications;
   HED is the percentage weekly heavy episodic drinking amongst drinkers;
   $\beta_0, \beta_1, \beta_2$ and β_3 are coefficients; and
   ε is the error variable.

As in previous case, a summary on obtained values for regression statistics is shown in Table 4.

As the value of the test statistic F is $F = 13.4$, which is larger than the parameter value of $F = 3.03$ and the p value is $p = 0.001$, there is overwhelming evidence to reject the null hypothesis and infer that a linear relationship exists. The model is a much better fit with 67.9% of the DALYs per 100,000 population now being explained by the percentage change in per capita consumption and the drinking patterns within a country. Increased per capita consumption, therefore does lead to increased alcohol-related harm, especially if combined with unhealthy drinking patterns. This is particularly worrying in the case of South Africa, due to the unhealthy drinking patterns within the country.

Table 4. Summary output regression statistics considering alcohol-related harm as a function of per capita consumption

Statistic/measure	Value
Multiple R	0.8239
R Square	0.6788
Adjusted R square	0.6281
Standard error	178.8665
Observations	23

5.3 Alcohol advertising's effect on alcohol consumption

To test the relationship between advertising expenditure and total per capita consumption, time-series data from the USA was utilised. The relationship was analysed through simple regression analysis based on a straight linear relationship that is depicted by the following formula:

$$PCC_t = \beta_0 + \beta_1 (Adex_t) + \varepsilon \qquad [3]$$

where,
   PCC_t is the per capita alcohol consumption in gallons per year;
   $Adex_t$ is the advertising expenditure in US$ million;
   β_0 and β_1 are coefficients; and
   ε is the error variable.

Table 5. Summary output regression statistics considering *Alcohol advertising's effect on alcohol consumption*

Statistic/measure	Value
Multiple R	0.2511
R Square	0.0630
Adjusted R square	0.0110
Standard error	2.0355
Observations	20

The new summary on obtained values for regression statistics is shown in Table 5. The first step is to infer whether a linear relationship exists. As the value of the test statistic t is $t = 1.1$, which falls inside the test parameter of $t = 2.09$ and the p value is high ($p = 0.29$), there is no evidence to infer that the alternative hypothesis is true.

The null hypothesis that alcohol advertising has no effect on alcohol consumption can therefore not be rejected. If the coefficients are analysed it implies that that there will only be a 0.004 gallon increase in consumption for every US$ million spent on advertising, although the standard error is high at 0.003. In effect, this could mean that every US$ million spent on advertising will only yield a 0.001 gallon increase in consumption. The opposite is therefore true as well; a complete advertising ban would have little effect on alcohol consumption, as they are not linearly related.

5.4 Pricing's effect on alcohol consumption.

To test the relationship between the percentage change in price and the percentage change in per capita consumption, GISAH time-series data were utilised. The relationship was analysed through simple regression analysis based on a straight linear relationship that is expressed by the formula:

$$\Delta PCC_t = \beta_0 + \beta_1 (\Delta P_t) + \varepsilon \qquad [4]$$

where,
    ΔPCC_t is the change in per capita alcohol consumption;
    ΔP_t is the percent change in price per standard unit of alcohol;
    β_0 and β_1 are coefficients; and
    ε is the error variable.

This time, the summary on obtained values for regression statistics is shown in Table 6.

As the value of the student-t test statistic t is $t = -18.25$, falling well outside the test parameter of $t = -2.04$ and the p value is zero, there is overwhelming evidence to reject the null hypothesis and infer that an inverse linear relationship exists. Statistically, this result is considered highly significant. The model is a very strong fit, with 92.3% of the variance in per capita consumption explained by the percentage change in price at a 95% confidence level.

Table 6. Summary output regression statistics

Statistic/measure	Value
Multiple R	0.9605
R Square	0.9225
Adjusted R square	0.9197
Standard error	0.6682
Observations	30

By analyzing the coefficients, it can be deduced that a 10% increase in price would result in a 5.8% decrease in per capita consumption of alcohol. This implies an average price elasticity of -0.58 for the sample population examined here. In this sense, Wagenaar et al. (2009) conducted a meta-analysis of 112 previous studies on alcoholic beverage price and tax levels and found a mean price elasticity for beer of -0.46, a mean price elasticity for wine of -0.69, a mean price elasticity of -0.80 for spirits, with a mean price elasticity for total alcohol of -0.51.

6. Conclusions and recommendations

Alcohol abuse poses a significant threat to the health and well-being of people globally. It ranks as one of the three leading risk factors for poor health. Alcohol abuse deprives people of quality of life and places tremendous strain on health services and the public sector in general. Developing countries such as South Africa experience disproportionately high levels of alcohol related harm and struggle to cope with this burden. Increased alcohol abuse has causally been linked to increased levels of crime, violence, injury and motor vehicle fatalities. This research study aimed to evaluate alternative alcohol control policies and to identify more effective alternatives, which can be used in conjunction with social marketing campaigns, in addressing the problem of alcohol abuse.

The policy framework (Table 2) was used to assess the relative strength of South African liquor policy against international benchmarks and identify areas for policy improvement. Essentially, alcohol control policies that regulate the physical environment in which alcohol is consumed and purchased, by influencing the availability and affordability of alcoholic beverages were the most effective policies in reducing per capita alcohol consumption and alcohol related harm. Based on the findings of this study the following conclusions and recommendations can be made:

a) *Raise the legal drinking age*: evidence was found to infer a link between per capita alcohol consumption and the level of alcohol related harm within a country. Increased per capita income, therefore leads to increased alcohol related harm, especially if combined with unhealthy drinking patterns. This is particularly worrying in the case of South Africa, due to the unhealthy drinking patterns and instances of heavy episodic drinking within the country. The current minimum legal drinking age of 18 should be revisited, when compared to the levels of hazardous drinking amongst adolescents and young people within South Africa. A legal drinking age of 21 is recommended, and would reduce the harm associated with alcohol abuse.

b) *Restricting days and operating hours*: violent crimes, motor vehicle accidents and injuries can all be reduced through placing restrictions on alcohol availability. A ban on Sunday trading and limiting the business hours of clubs and pubs would reduce the harm associated with alcohol abuse. It is recommended that a midnight closing time be instituted for on-premise outlets to reduce the probability of drunken driving and increased injury risk. A ban on Sunday trading should also be enforced across all provinces.

c) *Institute a minimum pricing policy*: the regression analysis results for a link between per capita alcohol consumption and price was statistically highly significant. Strong evidence was found to conclude that price plays a major role in determining per capita consumption. The importance of alcohol control policies in reducing alcohol affordability is critical in reducing alcohol consumption. Not all beverage types react in a similar way to price increases. Beer is less sensitive to pricing fluctuations, whereas wine and spirits are highly responsive to pricing. It is recommended that a minimum pricing policy be adopted to supplement the current excise tax policy in order to target cheap alcohol and high alcohol by volume products in order to decrease consumption.

d) *Reduce the current Blood Alcohol Content (BAC) limit*: drunk driving is a serious offence in South Africa which carries a maximum sentence of six years and fines of up to €12,000. The current legal BAC for drivers in South Africa is 0.05 g/100 ml, whilst the legal BAC limit for public transport drivers is 0.02g/100ml. It is recommended that a zero-tolerance policy be adopted due to the high levels of drunken driving, and harm related with this, therefore decreasing the legal BAC level to 0.0g/100ml.

e) *Driver's license suspensions*: in order to reduce drinking and driving behaviour, it is recommended that a policy be instituted whereby drivers' licenses can be suspended for a period of three months for first time offenders, six months for repeat offenders and longer periods for habitual drunk drivers, reducing the risk on roads and possible harm.

f) *Advertising restriction*: consistent with most other studies no relationship between alcohol advertising expenditure and per capita consumption was found. Alcohol advertising has little or no effect on population-wide per capita consumption, therefore it would not be an effective policy in addressing alcohol abuse within society. Based on the regression model used every incremental US$ million spent on advertising would only increase per capita consumption by 0.001 gallons per annum. Alcohol advertising is predominately used to influence brand choice. Although the findings do not support a complete ban on alcohol advertising, it is recommended that alcohol advertising is restricted by measures to reduce the exposure of children and young adults to alcohol messaging.

g) *Social marketing campaigns*: various social marketing campaigns to change alcohol abuse behaviour exist in South Africa, namely governmental (*Arrive Alive*) and alcohol industry initiatives. If implemented correctly, these social marketing initiatives can effectively reduce the levels of alcohol abuse by changing consumption behaviour. Many of the existing social responsibility and social marketing programmes are however not aligned to or based on global social marketing programmes, which have proven to be effective programmes. Based on the findings of this study the South African social marketing campaigns should be directed towards other preventative areas as well, such as underage drinking, violence and blood alcohol limits. Additionally these social marketing campaigns should also address other impact areas (health, foetal alcohol syndrome, etc.) related with the harmful use of alcohol. Finally social marketing campaigns should be evidence based and evaluated to ascertain whether these interventions are successful.

Finally, limitations of this study should be mentioned, including that secondary data were used for analysis, where most of the data were based on developed countries, with distinctly different consumption and income profiles. Similarly, the price elasticity figures used in this research project were mostly based on studies done in the USA and Western European countries. Future studies should gather country specific data for more accurate projections. Furthermore, for the purposes of this study only simple linear models were used to deduce whether a relationship existed between the various variables tested. Complex polynomial models would provide a better fit to the outcomes of several of the dependant variables tested in this research project. Only pricing policies were tested for their effectiveness, and future research is needed to thoroughly test the other control policies, especially availability policies.

References

Ambler, T. (2009).Public health, advertising and reality. *World Economics*, 10(4), 161-180.

Anderson, P. (2009). Is it time to ban alcohol advertising? *Clinical Medicine*, 9(2),121-124.

ARA (2011). The South African liquor industry: our contribution. Association for Responsible Alcohol Use. http:// www.ara.co.za/. Accessed 6 September 2012.

ARA (2012). SAB committed to fighting alcohol abuse and drunk driving. Press release. Association for Responsible Alcohol Use. http:// www.ara.co.za/. Accessed 9 December 2012.

Arrive Alive (2012). Campaign website. Arrive Alive. http://www.arrivealive.co.za/. Accessed 14 August 2012.

Babor, T., Caetano, R., Caswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenevald, P. J., Hill, L., Holder, H., Homel, R., Osterberg, E., Rehm, J., Room, R., & Rossow, I. (2010). *Alcohol: no ordinary commodity. Research and public policy*. Oxford: Oxford University Press.

BMA (2012). Reducing the affordability of alcohol. A briefing from the BMA Board of Science (April 2012). British Medical Association. http://www.bma.org.uk/. Accessed 9 December 2012.

Carragher, N., & Chalmers, J. (2011). *What are the options? Pricing and taxation policy reforms to redress excessive alcohol consumption and related harms in Australia*. Sydney: NSW Bureau of Crime Statistics and Research.

Chaloupka, F. J., Grossman, M., & Saffer, H. (2002). The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Research and Health*, 26(1), 22-34.

Cook, P. J., Moore, M. J. (2002). The economics of alcohol abuse and alcohol-control policies. *Health Affairs*, 21(2), 120-133.

DNA Economics (2011). Baseline study of the National Liquor Act 59 of 2003. DNA Economics. http://www.dnaeconomics.com/. Accessed 9 December 2012.

DTI (2012). Report on liquor regulation conference held March 8th at Gallagher Estate (Midrand, Gauteng). Department of Trade and Industry of the Republic of South Africa. http://www.thedti. gov.za/. Accessed 9 December 2012.

Matzopoulos, R. (2005). Alcohol and injuries - a clear link. *Southern African Journal of Epidemiology and Infection*, 20(4),114-115.

NAA (2012). Website. National Alliance for Action on Alcohol. http://www.actiononalcohol.org.au/. Accessed 12 August 2012.

Nevill, G. (2012). Crunching the numbers: what 2011 ad spend can tell us about 2012. The Media Online. http://themediaonline.co.za/. Accessed 23 March 2012.

OECD (2012). Website. Organization for Economic Co-operation and Development. http://www.oecd. org/. Accessed 29 October 2012.

Osterberg, E. (2004). What are the most effective and cost-effective interventions in alcohol control? Health Evidence Network report. World Health Organization Regional Office for Europe. http://www. euro.who.int/. Accessed 17 July 2012.

Parry, C. D. H., & Dewing, S. (2006). A public health approach to addressing alcohol-related crime in South Africa. *African Journal of Drug & Alcohol Studies*, 5(1), 41-56.

Parry, C. D. H., Harker-Burnhams, N., & London, L. (2012). A total ban on alcohol advertising: presenting the public health case. *South African Medical Journal*, 102(7), 602-604.

Parry, C. D. H., Morojele, N. K., & Jernigan, D. (2008). Creating a sober South Africa. In S. Pennington (Ed.), *Action for a safe South Africa* (pp. 68-75). Paarl, South Africa: SA Good News.

Peltzer, K., Davids, A., & Njuho, P. (2011). Alcohol use and problem drinking in South Africa: findings from a national population-based survey. *African Journal of Psychiatry*, 14, 30-37.

Prince, C., Du Plessis, C. (2011). Alcohol advertising ban 'no matter what'. Times Live 5th July 2011. Times Live. http://www.timeslive.co.za/. Accessed 10 August 2012.

SAB (2010). Working for South Africa: the contribution of SAB to the South African economy. South African Breweries. http://www.sabmiller.com/. Accessed 7 September 2012.

Saffer, H., & Dhaval, D. (2002). Alcohol consumption and alcohol advertising bans. *Applied Economics*, 34(11), 1325-1334.

Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students*. 5th ed. Harlow: Pearson.

Sukhai, A., Jones, A., Love, B., & Haynes, R. (2011). Temporal variations in road traffic fatalities in South Africa. *Accident Analysis & Prevention*, 43(1), 421-428.

Wagenaar, A., Tobler, A., & Komro, K. (2010). Effects of alcohol tax and price on morbidity and mortality: a systematic review. *American Journal of Public Health*, 100, 2270-2278.

WHO (2010). *Global strategy to reduce the harmful use of alcohol*. Geneva: World Health Organization.

WHO (2011). *Global status report on alcohol and health*. Geneva: World Health Organization.