



Universidade Nova de Lisboa
Instituto de Higiene e Medicina Tropical

Alcohol consumption in the African context:
Contributions to a public health approach to policy
decisions

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**DISSERTAÇÃO PARA A OBTENÇÃO DO GRAU DE DOUTOR EM
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Contributions to a public health approach to
policy decisions

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LIST OF PUBLICATIONS

This thesis is based on the four papers listed below, which will be referred to throughout the text by their Roman numerals.

- I. Ferreira-Borges, C., Rehm, J, Parry, C.D.H., Dias, S. & Babor, T. The impact of alcohol on the people of Africa in 2012: an analysis of burden of disease. Manuscript (submitted).
- II. Ferreira-Borges, C., Dias, S., Parry, C.D.H., Babor, T. & Esser, M.B. 2015. Alcohol and public health in Africa: can we prevent alcohol-related harm from increasing? *Addiction*, Doi: 10.1111/add.12916.
- III. Ferreira-Borges, C., Esser, M.B., Dias, S., Babor, T. & Parry, C.D.H. 2015. Alcohol Control Policies in 46 African Countries: opportunities for Improvement. *Alcohol and Alcoholism*, Doi: 10.1093/alcalc/agv036.
- IV. Ferreira-Borges, C., Endal, D., Babor, T., Dias, S., Kachiwiya, M. & Zakeyu, N. 2014. Alcohol policy process in Malawi: making it happen. *International Journal Alcohol and Drug Research*, 3, 187 – 92.

CONTRIBUTORS

I conceptualised and defined the objectives for all the studies included in this thesis. I was also responsible for the literature review and for writing the first draft of all articles. I analysed qualitative data for studies II and IV and participated in the data analysis for study I and in the statistical data analysis for study III.

*“We must open doors and we
must see to it they remain open,
so that others can pass through.”*

Rosemary Brown (1930–2003), the first
Black woman to be elected to a
provincial legislature

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ABSTRACT

Alcohol-related problems and burden of disease in Africa has been largely neglected. Due to the rapidly changing context in several countries and new scientific evidences of alcohol-attributable diseases, such as HIV and TB incidence, alcohol-related problems and burden of disease in Africa might be higher than what has previously been estimated. At the same time there is little information on the extent to which African countries are addressing alcohol consumption and alcohol-related harm, which suggests that evaluations of national alcohol policies are needed in this region.

The overall aim of this thesis is to review evidence about alcohol consumption and analyse alcohol-related policies in Africa, thus contributing to the improvement of alcohol-related policy decisions in this region. In particular the thesis concentrates on following four objectives: I) estimate alcohol-attributable mortality and morbidity in Africa; II) identify factors that might affect magnitude and patterns of alcohol consumption in Africa; III) evaluate national alcohol policy responses in 46 countries and their effectiveness to reduce alcohol-related harm; IV) document the different stages and actors involved in the development of alcohol policy in one African country (Malawi).

The research used different type of methods. Our results show that alcohol consumption has a large impact on burden of disease and mortality in African countries, with alcohol being responsible, in 2012, for 6.4% of all deaths and 4.7% of all DALYs in the Region (study I). Our analysis identified seven factors which are closely tied to potential changes in alcohol consumption in Africa. Driven largely by globalization, a potential convergence of these factors is likely to be associated with continued growth in alcohol consumption and alcohol-related morbidity and mortality across the continent (study II). Countries have been using different types of policy measures to control alcohol consumption. When evaluating current policy restrictiveness, countries attained a mean score of 44.1 of 100 points possible, ranging from 9.1 (Sao Tomé and Príncipe) to 75.0 (Algeria). According to our results, actual policy restrictiveness scores were negatively correlated with and APC among drinkers ($r_s = -.353$, $p = 0.005$) (Study III). Study IV reflects the difficulties and complexity of alcohol policy development in Malawi. Despite the influence of the alcohol industry in the agenda-setting and consultative process, when adequately resourced and supported, civil society organizations were found to play an

important and decisive role in steering policy developments in a sound public-interest direction.

Alcohol-attributable fractions of mortality and morbidity in many African countries are considerable and therefore alcohol cannot be left out of countries health and development agendas. African governments need to take a more active role in protecting the public's health. Although countries have adopted some type of policy measures to control alcohol consumption, our results show that there is a need for a stronger policy response to reduce alcohol-related burden in the continent. Finally, due to the inherent difficulties in alcohol policy development, governments should strongly consider increasing the involvement of civil society organisations to support sound public-interest direction.

Keywords: Alcohol consumption, alcohol policies, alcohol-related disease burden, Africa

RESUMO

A contribuição dos problemas ligados ao álcool para a carga de doenças em África tem sido amplamente negligenciada. Devido a rápidas mudanças no contexto de vários países e a novas evidências científicas relativas a doenças atribuíveis ao álcool, tais como HIV e a incidência de TB, os problemas e carga da doença em África relacionados com o consumo de álcool podem ser maiores do que o que foi previamente estimado. Ao mesmo tempo existe pouca informação sobre a forma como os países estão a gerir o consumo de álcool e as consequências ligadas a esse consumo, o que sugere que uma avaliação das políticas nacionais é necessária nesta região.

O objetivo geral desta tese é o de rever as evidências relacionadas com o consumo de álcool em África e analisar as políticas do álcool existentes, contribuindo assim para a melhoria das decisões políticas relacionadas com esse consumo na região. Em particular, a tese concentra-se nos quatro objetivos específicos seguintes: I) estimar a mortalidade e morbilidade atribuídas ao álcool em África; II) identificar os fatores que podem afetar a magnitude e os padrões de consumo de álcool em África; III) avaliar as respostas políticas nacionais relacionadas com o consumo de álcool em 46 países e sua eficácia para reduzir os malefícios relacionados com esse consumo; IV) documentar as diferentes etapas e atores envolvidos no desenvolvimento de uma política relativa ao consumo de álcool num país Africano (Malawi).

A investigação utilizou diferentes tipos de métodos. Os resultados mostram que o consumo de álcool tem um grande impacto sobre a carga de doença e mortalidade nos países africanos, com o álcool sendo responsável, em 2012, por 6.4% de todas as mortes e 4.7% de todos os DALYs na Região (estudo I). A nossa análise identificou sete fatores que estão intimamente ligados a possíveis mudanças no consumo de álcool em África. Impulsionada em grande parte pela globalização, a convergência potencial desses fatores é suscetível de se associar a um crescimento contínuo no consumo de álcool bem como ao aumento da morbilidade e mortalidade relacionada ao álcool em todo o continente (estudo II). Os países têm vindo a utilizar diferentes tipos de medidas de política para controlar o consumo de álcool. A avaliação dos níveis atuais de restrição das políticas existentes, mostra que os países atingiram uma pontuação média de 44,1 de 100 pontos possíveis, variando entre 9,1 (São Tomé e Príncipe) e 75,0 pontos (Argélia). De acordo com nossos resultados, os níveis de restrição das políticas existentes estão negativamente correlacionados com o consumo de álcool em consumidores atuais ($r_s = -0.353$, $p = 0,005$) (Estudo III). O estudo IV reflete as dificuldades e complexidade dos processos políticos e sociais na elaboração de políticas de álcool no

Malawi. Apesar da influência da indústria do álcool no estabelecimento da agenda política e no processo de consulta, o nosso estudo demonstra que as organizações da sociedade civil, quando devidamente financiadas e apoiadas, podem desempenhar um papel importante e decisivo na evolução da política do governo com vista a defesa do interesse público.

As frações de mortalidade e morbidade atribuídas ao álcool em muitos países africanos são consideráveis e, portanto, o álcool não pode ser deixado de fora das agendas de saúde e desenvolvimento desses países. Os governos africanos precisam de ter um papel mais ativo na proteção da saúde da população. Embora os países tenham adotado algum tipo de medidas de políticas para controlar o consumo de álcool, os nossos resultados mostram que há uma necessidade de uma resposta política mais forte para reduzir a carga relacionada com o consumo de álcool no continente. Finalmente, devido às dificuldades inerentes ao desenvolvimento de políticas do álcool, os governos devem considerar fortemente o aumento da participação das organizações da sociedade civil para apoiar uma direção no sentido da defesa do interesse público.

Palavras-chave: Consumo de álcool, Políticas do álcool, Carga das doenças relacionadas com o álcool, África.

TABLE OF CONTENTS

LIST OF PUBLICATIONS	iii
ACKNOWLEDGMENTS	vii
ABSTRACT	ix
RESUMO	xi
LIST OF TABLES	xv
LIST OF FIGURES	xvi
LIST OF ABBREVIATIONS	xvii
1. GENERAL INTRODUCTION	1
1.1. Background	3
1.1.1. Alcohol consumption	4
1.1.2. Patterns of drinking	8
<i>a) Abstinence</i>	8
<i>b) Heavy episodic drinking and patterns of drinking score</i>	9
1.1.3. Factors affecting alcohol consumption	10
<i>a) Age</i>	11
<i>b) Gender</i>	12
<i>c) Economic development and socio-economic status</i>	13
<i>d) Alcohol production, distribution and regulation</i>	14
1.1.4. Relationship between alcohol consumption and health outcomes	16
1.1.5. Alcohol-related harms	19
1.1.6. Alcohol policies and public health	22
1.1.7. Effective alcohol policies	24
<i>a) Pricing and taxation</i>	25
<i>b) Availability controls</i>	25
<i>c) Drinking and Driving Countermeasures</i>	26
<i>d) Education and Persuasion Strategies</i>	26
<i>e) Restrictions on Alcohol Marketing</i>	27
<i>f) Treatment and early intervention services</i>	27
1.1.8. Establishment of an alcohol policy agenda in Africa	28
1.1.9. Relevance of the theme	29
1.2. References	31
2. OBJECTIVES	53

3. RESULTS	57
Study I - The impact of alcohol in the people of Africa in 2012: an analysis of burden of disease.....	59
Study II - Alcohol and public health in Africa: can we prevent alcohol-related harm from increasing?.....	75
Study III - “Alcohol control policies in 46 African countries: Opportunities for improvement”.....	87
Study IV - Alcohol policy process in Malawi: making it happen.....	99
4. GENERAL DISCUSSION AND CONCLUSIONS.....	109
4.1. Main findings.....	112
4.2. Study implications and recommendations	119
4.3. Future research	120
4.4. Conclusions	122
4.5. References	125

LIST OF TABLES

Table 1 – Alcohol use prevalence (%) among 13-15 year old students in WHO African Region.....	7
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LIST OF FIGURES

Figure 1 – Adult per capita consumption in 2010	6
Figure 2 – Levels of abstention in 2010	9
Figure 3 – Conceptual model of alcohol consumption and health outcomes	11
Figure 4 – Model of alcohol consumption, intermediate outcomes and long-term consequences	17
Figure 5 – Alcohol-attributable fractions (AAFs) for deaths from all causes, 2012 (as a percentage of all deaths)	20

LIST OF ABBREVIATIONS

15+	population of those aged 15 years and older
AAF	alcohol-attributable fraction
AFR	WHO African Region
AIDS	Acquired Immunodeficiency Syndrome
APC	alcohol per capita consumption
BAC	blood alcohol concentration
BoD	burden of disease
DALY	disability-adjusted life year
FASD	Fetal Alcohol Spectrum Disorder
GDP	gross domestic product
GISAH	WHO Global Information System on Alcohol and Health
GSHS	Global School-based Student Health Surveys
HED	heavy episodic drinking
HIV	human immunodeficiency virus
MLPA	minimum legal purchase age
NCD	noncommunicable disease
PCA	Adult per capita consumption
UN	United Nations
WHA	World Health Assembly
WHO	World Health Organization

1. GENERAL INTRODUCTION

1 GENERAL INTRODUCTION

This thesis is focused on alcohol in Africa. It presents new evidence on alcohol consumption and related disease burden and also reviews existing policy responses to improve alcohol-related policy decisions in this region.

The research is organised under four main sections. In section one, I provide the background of the thesis conducting a state of the art review regarding alcohol consumption, patterns of drinking and alcohol-related harms in Africa. I also describe effective alcohol policies and present major policy developments that helped framing alcohol as a global and regional health issue. Finally, under this section, I discuss the relevance of this study to public health. In section two, I present the main purpose and objectives of the thesis and in section three, I present the results of the four papers produced. These papers focus on burden of disease in Africa, describe factors affecting alcohol consumption, provide an analysis of existing policy responses and present the development process of alcohol control policies in one African country. In section four, I discuss the main findings and limitations of this thesis and present recommendations that aim at improving alcohol-related policy decisions in Africa. To close, I identify new areas for research and provide a final conclusion of the work developed.

1.1. Background

Alcoholic beverages are an important, economically and culturally embedded commodity (Alcohol and Public Policy Group, 2010). However, from a public health perspective, alcohol plays a major role in the causation of disability, disease and death in the world (Rehm et al., 2003; Rehm et al., 2010a). Although alcohol consumption may vary from country to country, consumption has been rising and so has alcohol-related harm (WHO, 2014a).

As with tobacco, the growth of modern industrial production has contributed to tendency to replace change traditional patterns of drinking (Obot, 2000; Room et al., 2002). New drinks have been introduced as well as new modes of production and distribution rendering alcohol available at any season and any time (Jernigan, 2000; Room et al., 2005). Increased industrialised alcohol supply and availability, together with the development of sophisticated

marketing and promotion techniques seem to be influencing the way that people drink and reflect the changing context for alcohol use and alcohol-related harm (Casswell, 2009).

With the increasing evidence of the impact of harmful use of alcohol on global health, alcohol consumption in Africa has increasingly gained attention from researchers and policy makers. Attempts from the alcohol industry to influence national alcohol policies have been described (Bakke & Endal, 2010). However, even if interest in the topic has grown in the past decades, many questions remain unanswered, particularly with respect to trends in alcohol consumption, alcohol's contribution to the burden of disease and the public health response.

1.1.1. Alcohol consumption

Alcohol has been consumed in human societies for thousands of years and has been a constant presence in different socio-cultural milieus (Smart, 2007). However, concerns about its misuse, especially after the introduction of certain forms of alcoholic beverages, such as spirits, have been raised ever since (Room et al., 2005). As industrialization progressed, drunkenness in many countries was seen as inconsistent with a reliable and efficient workforce and over time, more and more personal, economic, criminal, family, social, moral, and religious problems were attributed to alcohol. This led to the rise of popular social groups in different parts of the world, namely in the US and Europe that aimed at limiting or even prohibiting drinking during the so-called Temperance Movement. After a period of experimentation in some countries with alcohol prohibition, this was replaced by alcohol control measures designed to limit consumption and minimize harm (Hanson, 2013).

In traditional African societies, alcohol consumption was gender and age based, being mainly consumed by adult males in social engagements such as religious rituals, marriage ceremonies, kingship enthronements, child naming and even funerals (Wills, 2006). Tradition regulated production and consumption of locally made alcoholic drinks and though young people in a few communities were permitted to drink, this was usually in the presence of adults who monitored the quantity they consumed (Obot, 2000). Alcohol was consumed immediately after production, or a few hours after production since there were no means of

preservation. Where trade in alcohol did exist, it was on a remarkably low scale (Willis, 2002). This trend was altered in Western Africa following the influx of European slave traders in the 15th century. New ways of trading and new organizational settings (towns) introduced important changes in the way alcohol was consumed (Wills, 2006). Alcohol became readily available to all, male and female, on a commercial basis. Moreover, alcohol became a revenue source for western traders and was often part of the payment for territorial concessions extracted from African chiefs by European envoys (Dumbili, 2013). Throughout the colonial period, missionaries and other observers noted the devastating effects of alcohol on African village life (Pan, 1975). Late in the 19th century, as part of the World Temperance Movement, Christian missionaries advocated for a cessation of the liquor trade. For large parts of Africa, the colonial powers agreed to refrain from the alcohol trade, primarily with regard to distilled spirits (Jernigan & Babor, 2015). However this was only temporary as, with the influx of western cultures and traders, industrialised alcoholic beverages became readily available on a commercial basis due to the importation, sale and distribution of trade spirits (Jernigan & Obot, 2006; Jernigan & Babor, 2015).

The distribution of alcohol consumption across countries in Africa¹ is very heterogeneous and the type of drinks consumed differ geographically. Around one third of all the alcohol consumed is ‘unrecorded’² (1.8 litres), often being home-brewed through artisanal production, either by fermenting malted grains, fruits, sugar cane, honey or palm trees or by distilling them (WHO, 2014a). These types of drinks are easily produced and have been present in most African societies in some form for centuries, being part of all major life transitions, linked to rituals and to special occasions (Obot, 2006). Despite the fact that tradition remains strong, changes in production have replaced traditional consumption and commercially produced drinks have penetrated into the habits of many Africans (Jernigan & Babor, 2015). In 2010, fermented beverages (made of sorghum, millet, maize, rice, wheat or

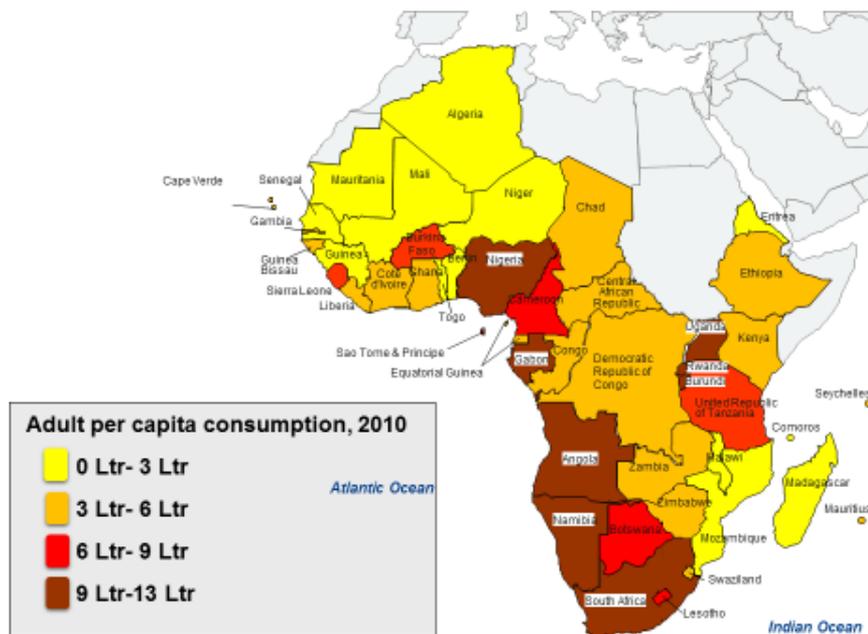
¹ Africa is a diverse continent containing 54 countries.

² Unrecorded alcohol refers to alcohol that is not taxed in the country where it is consumed because it is usually produced, distributed and sold outside the formal channels under government control. Unrecorded alcohol consumption in a country includes consumption of home-made or informally produced alcohol (legal or illegal), smuggled alcohol, alcohol intended for industrial or medical uses, and alcohol obtained through cross-border shopping (which is recorded in a different jurisdiction).

fruits) accounted for 51,6% of all alcohol consumption in the WHO African Region³. The second most consumed beverage was beer which accounted for 33.7% of total recorded alcohol consumed in the Region (WHO, 2014a). Nigeria's 160 million people are now the world's second largest consumer of Guinness, after Britain, and it has been estimated that between 1999 and 2000, the demand for beer grew by 143%, a demand that has been increasingly difficult to meet with current production capacity (Obot, 2007).

Several surveys provide insights into the total amount of alcohol consumed in Africa. According to the WHO Status Report on Alcohol and Health 2014 (WHO, 2014), the total adult per capita consumption (APC) of alcohol in this region (i.e. the volume of alcohol consumed by each individual aged 15 years or older on average) in 2010 was approximately 6.0 litres of pure alcohol, implying a slight decrease since 2004, when estimates pointed to about 6,2 litres of pure alcohol per person per year (Rehm et al., 2009a; WHO, 2013a). Substantial variations exist in adult per capita consumption in African countries as shown in Figure 1.

Figure 1 – Adult per capita consumption in 2010



Source: WHO, 2014a

³ World Health Organization (WHO) African Region (includes all countries on the African continent except for Djibouti, Egypt, Libya, Morocco, Somalia, Sudan, and Tunisia).

The highest consumption levels can be found in southern Africa, with Namibia and South Africa having the highest levels while low consumption levels can be found in the countries of North Africa and sub-Saharan Africa, like Niger, Senegal or Guinea (WHO, 2014a). These countries represent large populations of the Islamic faith, which have very high rates of abstention. Projections up to 2025 point to a relative stability on alcohol per capita consumption in this region (WHO, 2014a). Another survey, the global school-based health survey (GSHS), provides some specific data on alcohol consumption among youth in several African countries (WHO, 2014b). Table 1 shows the prevalence of alcohol use and drunkenness per country and by gender but also shows that many adolescents have already been drunk at least once in the lifetime.

Table 1 – Alcohol use prevalence (%) among 13-15 year old students in WHO African Region⁴

<i>Countries</i>	<i>Past 30 days (total)</i>	<i>Boys</i>	<i>Girls</i>	<i>Drunkenness, lifetime (total)</i>	<i>Boys</i>	<i>Girls</i>
<i>Seychelles (2007)</i>	61.6	62.1	61.2	53.1	56.2	50.0
<i>Zambia (2004)</i>	42.3	38.7	45.1	42.8	38.6	46.5
<i>Namibia (2004)</i>	32.8	35.0	30.9	31.8	35.4	28.9
<i>Ghana (2007)</i>	28.1	26.4	29.3	32.7	32.0	33.0
<i>Botswana (2005)</i>	20.6	22.8	18.7	20.9	24.9	17.4
<i>Zimbabwe (Bulawayo) (2003)</i>	20.0	23.2	17.7	19.0	24.2	15.3
<i>Kenya (2003)</i>	14.6	16.8	12.3	19.7	24.4	15.1
<i>Mauritius (2007)</i>	17.9	19.3	16.8	17.4	21.3	13.9
<i>Benin (2009)</i>	16.4	18.2	12.5	13.2	14.3	11.0
<i>Swaziland (2003)</i>	16.0	19.6	14.3	18.7	23.8	15.10
<i>Uganda (2003)</i>	12.8	14.1	11.6	15.2	16.6	13.9
<i>Tanzania (2006)</i>	5.8	6.7	4.6	5.5	7.5	3.4
<i>Malawi (2009)</i>	3.9	5.3	2.5	3.2	3.4	2.3
<i>Senegal (2005)</i>	3.2	4.0	2.0	4.8	6.6	2.1

⁴ All countries for which data was available.

Results from the survey show that alcohol consumption starts at an early age and that in some countries girls drink almost as much or even more than boys. Differences can be observed across countries with past month prevalence rates ranging from about 3.2% to 61.6%.

However, as pointed out in the WHO 2014 report (WHO, 2014a), simply assessing total alcohol per capita consumption may lead us to erroneous conclusions. As the population grows, the total APC will not reflect increases in the total alcohol consumed in the population. Due to its demographic characteristics (very young population), eventual increases in the total amount of alcohol consumed (even if not translated in increases in APC) are expected in the WHO African Region.

1.1.2. Patterns of drinking

Although per capita consumption matters in creating an accurate picture of the impact of alcohol consumption in health and social well-being of the population, the way people drink – pattern of drinking – can have a major influence on the extent of damage caused by alcohol consumption. The most influential indicators related to patterns of drinking include abstention and heavy episodic drinking.

a) Abstention

In 2010, a majority of Africa's adult population had abstained from drinking alcohol in the past 12 months (WHO, 2014a). These individuals may be lifetime abstainers or former drinkers. Current data available shows that 70,2% of the African population (15+) had not drunk alcohol in the past 12 months, and 12.8% had ceased alcohol consumption (i.e. they have consumed alcohol earlier in life but not in the past 12 months). More than half of the adult population (57.4%) has never consumed alcohol (WHO, 2014a).

The overall proportion of abstainers in a group of people is essential in interpreting per capita consumption numbers. Figure 2 shows estimates of the proportion of people who abstain from alcohol use in different countries in the African Region. In some countries more than 80% of the adult population, that is those aged 15 years or older, do not consume alcohol.

meals, especially among young people (Obot, 1993; Eide & Acuda, 1996; Ibanga et al., 2005; Tumwesigye & Rogers, 2005). Surveys focusing on behaviours of urban youth and students confirm early onset of drinking (ages 10-16), high levels of alcohol misuse among school students (Parry et al., 2004; Peltzer, 2009a) and important changes in patterns of consumption with alcohol deliberately used to get drunk and being perceived as modern and an essential component for having fun (Strijdom, 1992; Meursing & Morojele, 1989; Odejide, 2006).

How alcohol is consumed in a country is an important determinant of types and levels of problems associated with drinking. According to WHO, the prevalence of heavy episodic drinking (HED⁵) in African countries is relatively low (i.e. 16.4%); however, when looking at the WHO patterns of drinking score⁶ (that reflects how people drink instead of how much they drink in one occasion and is strongly associated with the alcohol-attributable burden of disease of a country), the figures show that most of the African countries have a score of 3 or even higher (WHO, 2014a). What this means is that though the per capita consumption of alcohol is generally low (compared with consumption in Europe for example), the most common pattern of drinking is one with high potential for causing health or social harm.

1.1.3. Factors affecting alcohol consumption

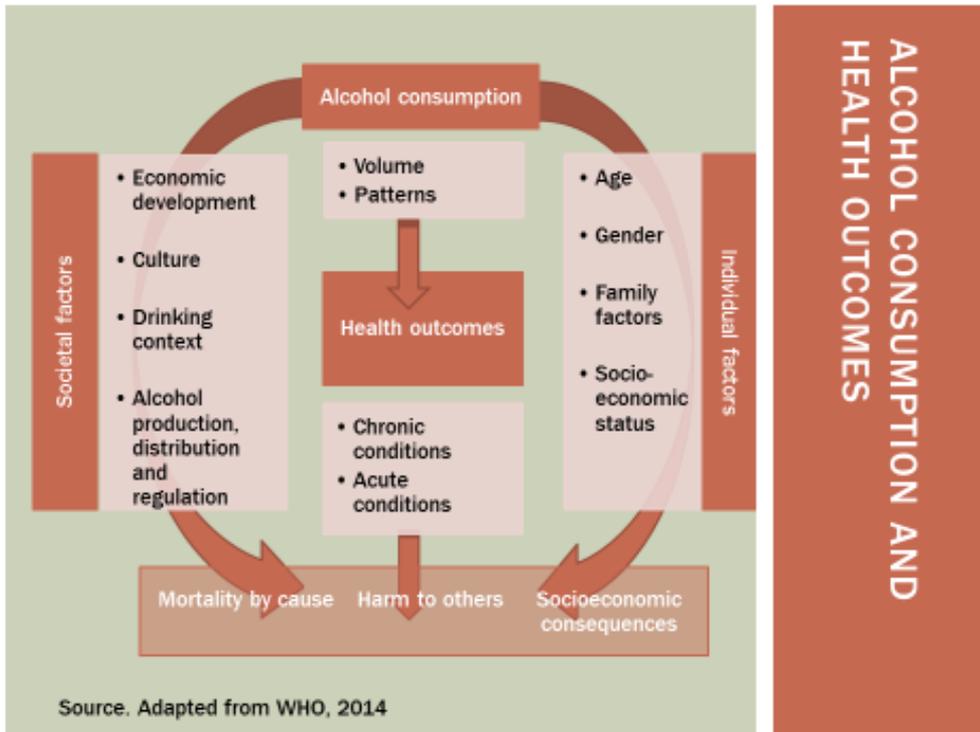
A variety of factors affect the magnitude and patterns of alcohol consumption, both at the individual and the societal levels (Figure 3). Individual factors, such as age, gender, family factors and socio-economic status, religious beliefs and cultural aspects, economic development, drinking context, alcohol production, distribution and regulation are all part

⁵ Episodic heavy drinking usually refers to a drinking occasion that includes consumption of 60 or more grams of pure alcohol on at least one single occasion at least monthly, although other definitions such as the consumption of five or more standard drinks per occasion might be used. In common terms it is frequently called binge drinking

⁶ PDS is basically an estimation of the level of hazard that might result from drinking, following from the underlying assumption that the consequences of alcohol consumption are related to volume consumed and how, when, and where consumption takes place. Some of the indicators used in determining drinking pattern are: the usual quantity of alcohol consumed per occasion; proportion of drinking events, when drinkers get drunk; proportion of drinkers, who drink daily or nearly daily; drinking with meals; drinking in public places.

of a complex causal chain that affect alcohol problem rates in different countries (Babor et al., 2010, WHO, 2014a).

Figure 3 - Conceptual model of alcohol consumption and health outcomes



Source: WHO, 2014a

These factors operate in complex ways to influence long-term trends in alcohol consumption as well as short-term epidemics. Some of them are of special relevance in the African context.

a) Age

Africa is the most youthful continent in the world. About 65% of the total population of Africa are below the age of 35 years, and over 35% are between the ages of 15 and 35 years (African Union Commission, 2014). Alcohol use by young people is an important policy-relevant dimension of drinking in African countries as elsewhere (Jernigan, 2006). Adolescents are more vulnerable to alcohol-related harm. From a behavioural point of view, they lack experience of drinking and its effects (Anderson et al., 2009a). They are also more vulnerable to alcohol-induced brain damage, which could contribute to poor performance at

school or work (Spear, 2002). In addition, youthful drinking is associated with an increased likelihood of developing alcohol abuse or dependence later in life (Grant et al., 1997; WHO 2004a). The consequences of alcohol use can be acute, and therefore immediate, such as automobile crash injury and death, blackouts, fighting, property damage, or they can be the accumulated, representing the cumulative effects of a chronic pattern of drinking (Aarons et al., 1999).

Evidence from different parts of the world shows that rapid increases in alcohol related social and health problems from either disorderly conduct or violence and injuries are often associated with drinking to intoxication by adolescents and young adults. In the African Region there has been longstanding interest by researchers in youth drinking behaviours (Flisher et al., 2001; Morojele et al., 2001; Obot et al., 2001; Obot, 2005; Mbona & Kasirye, 2005; Onya & Flisher, 2008; Francis et al., 2014). Underage drinking is associated with numerous negative consequences, such as accidental death and injury or engaging in other risky tasks after drinking, resulting in homicide and violence, suicide attempts, sexual assault, and risky sexual behaviour (Bonomo et al., 2001; Jernigan, 2001; Swahn & Donovan, 2005; WHO, 2009b). Several authors have noted that adolescents and young adults have become the specific target audience for alcohol marketers and therefore are at risk to further increase their alcohol consumption (Morojele et al., 2006a; Swahn et al., 2011).

b) Gender

Gender is a major determinant of drinking in Africa. Like in all regions in the world, more women than men abstained from drinking alcoholic beverages during the past year (WHO, 2014a). While the highest level of per capita alcohol consumption (4.4 to 6.2 litres of pure alcohol per person per year) among women occurs in Burundi, Gabon, Namibia, Nigeria, Rwanda, and Uganda, the lowest level of per capita alcohol consumption among women is observed in the countries of Northern Africa, which are predominantly comprised of people of the Islamic faith and therefore have very high abstention rates (WHO, 2014a).

Although overall rates of alcohol consumption among women in the African Region are generally still low and lifetime abstention is the most common pattern among women, some studies suggest changing patterns of consumption in this group (Martinez et al., 2011).

Research points to the fact that the gap between men and women in heavy alcohol consumption is narrowing and that more detrimental patterns of use are emerging among girls and women (Namagembe et al., 2010; Culley et al., 2013). This narrowing of the gender gap in heavy alcohol consumption among young women in some African countries is a phenomenon previously seen in several European nations and seems to be the result of increased availability of alcohol and other changes in the role of women in society (Wilsnack et al., 2005). When the focus is on drinkers only and when a pattern of regular consumption of large volumes of alcohol is considered, the difference between men and women seems to disappear (Ibanga et al., 2005; Tumwesigye & Rogers, 2005; Obot, 2006). In fact, among those women who drink alcohol, the highest level of alcohol consumption (17.7 to 24.5litres of pure alcohol per capita per year) is observed in Chad, Namibia, Uganda, and Ethiopia (WHO, 2014a). These per capita levels of alcohol consumption among women are amongst the highest recorded levels in the world. The incidence of fetal alcohol spectrum disorders and fetal alcohol syndrome is also a clear indicator that women are drinking. Studies from South Africa report the highest recorded foetal alcohol syndrome rate of 19-103 per 1000 births (May et al., 2007; WHO, 2006).

c) Economic development and socio-economic status

Over the last three decades, Africa has been experiencing its longest period of uninterrupted economic growth (AfDB, 2011). The anticipated economic development and strong population growth likely provide the most important backdrop for the future alcohol situation in Africa (Room et al., 2002). With an income per capita that has more than doubled in 23 African nations since 1990, and GDP growth rates that have averaged 5% per year over the last ten years(AfDB, 2011), certain goods, including alcohol, become more available and are affordable to more people. Research has shown that a greater economic wealth is broadly associated with higher levels of consumption and lower abstention rates (Rehm et al., 2009b).

Africa's population is also expected to double in size by 2020, and the majority of this population will belong to the youth cohort. Living in an urban environment facilitates access to commercial alcohol and can influence alcohol consumption (Bryden et al., 2012). With a young population that offers the best possible age structure for marketing alcoholic

beverages taking the forefront of Africa's advance towards cities, the absence of a supportive sociocultural context, housing difficulties, crime, poverty and unemployment tend to interact synergistically with alcohol consumption increasing the vulnerability of youth and of the poor to alcohol's harms (Sommers, 2009; Kalichman et al., 2006; Esan et al., 2013).

d) Alcohol production, distribution and regulation

Recent considerations on the rising epidemic of non-communicable diseases (NCDs) at global level and in sub-Saharan Africa (SSA) has helped move the discussion away from individual choices to the role of the social environment and globalization in the development of these epidemics (Dalal et al., 2011; Moodie, 2013; Stuckler et al., 2012). More particularly, industrialization and globalization have introduced major shifts in the way people consume several types of products, including high sodium processed foods, artificially sweetened beverages and alcohol products.

Jernigan (2002; 2009), Hill (2008) and others (Jahiel & Babor, 2007; Casswell, 2009; Babor et al., 2010; 2015) have described the increasing globalization of the alcohol industry from a public health perspective and their role in increased alcohol consumption. Producers of branded alcoholic beverages, which account for approximately 38% of recorded alcohol consumption world-wide, tend to be large multi-national corporations whose size and profitability support integrated marketing on a global scale (Jernigan & Babor, 2015). Size also allows considerable resources to be devoted, directly or indirectly, to promoting the policy interests of the industry.

One of the most powerful tools to encourage consumption of products like tobacco and alcohol used by industries is marketing (Anderson et al., 2009a). Marketing in general contributes to social norms and shapes the social environment in which the positive aspects of drinking are dominant and its use is normalized (Smith & Foxcroft, 2009; Hastings et al., 2009; Anderson et al., 2009a; Casswell, 2012). The mix of technologies employed to accomplish this task include traditional advertising (i.e. television, magazine advertising, billboards) as well as sponsorships, product placement, promotions, distribution and sale of branded merchandise, and the use of new and emerging technologies such as mobile phones

and the internet, which are all tailored to the cultural, religious and regulatory context (Evans & Hastings, 2008; Jernigan, 2010).

As with tobacco, industrialization of production and globalization of marketing and promotion of alcohol will increase both the amount of consumption and the harms associated with it. These findings have been supported, especially in the past decade, by the accumulation of a substantial body of literature on alcohol leading to greater understanding of the emerging situation worldwide (Moodie, 2013; West & Marteau, 2013).

There are no reasons why this situation would be different in the African context. Africa is a market that has been attracting global interest of the alcohol industry and where the growth and investment from the global industries is particularly strong (Jernigan & Obot, 2006; Babor et al., 2015). Several factors contribute to this rising interest: on the one hand, the unrealized potential for market growth of alcoholic beverages that comes from the exceptional population growth and the high rates of abstention (WHO, 2011a). In a continent with a young population and high levels of abstention, especially among females, the expansion of the alcohol market will also be associated with the industry capacity to recruit new drinkers through the increased use of alcohol marketing. Recent studies in African countries seem to confirm the influence of exposure to alcohol marketing on young people's drinking (Swahn et al., 2011; de Bruijn et al., 2013). Alcohol is widely and intensively advertised and promoted in TV commercials, billboards, newspapers, magazines, internet and (event) sponsoring. Drinking is portrayed as an emblem of success, and a symbol of heroism, courage and virility contributing to create a drinking culture (Jernigan & Obot, 2006; Jernigan, 2013; de Bruijn, 2011; Swahn et al., 2011; Obot 2013). At the same time, the weakness of the alcohol policy environment in most African countries, and poor enforcement measures, constitutes an opportunity to freely promote alcohol consumption in the continent (Bakke & Endal, 2010; Parry et al., 2012a; Jernigan, 2013).

While the impact of these factors has been also noted in other places where rapid economic changes are taking place such as China, India or Latin-America (Tang et al., 2013, Benegal, 2005; Monteiro, 2013), a comprehensive and systematic analysis is still missing for Africa.

1.1.4. Relationship between alcohol consumption and health outcomes

Although its social and health harms have been long identified, only recently has there been a scientific understanding of the relationship between alcohol and health, providing a basis for a public health approach to alcohol problems and for continuous epidemiological research. A central feature has been the shift from a focus on "alcoholism" to a focus on "alcohol-related problems" or "alcohol problems." (Room, 1984). Research contributed substantially to the understanding of the complexity of the relationship between alcohol consumption and health outcomes.

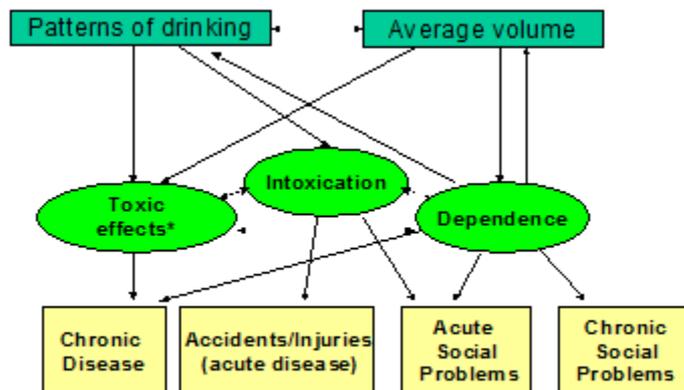
Alcohol is a psychoactive substance with dependence-producing properties (WHO, 2004a) and has been identified as one of the world's leading risk factors for morbidity, disability and mortality (Rehm et al., 2003). Alcohol contributes to as many as 200 health conditions, including some malignant neoplasms, mental and behavioural disorders, cardiovascular diseases, gastrointestinal conditions, reproductive disorders and pre-natal harm (WHO, 2014a; Rehm et al., 2010a). In addition, alcohol is also responsible for injuries resulting from aggressive behaviour and violence and road clashes and collisions that kill or disable people at a relatively young age, resulting in the loss of many years of life to death and disability (Room et al., 2005; Rehm et al., 2010a). Even small amounts of alcohol impact on the central nervous system, slowing down reaction time and impairing co-ordination and alertness. Both drinkers and non-drinkers may suffer from the consequences of alcohol use. The overall effects extend beyond the individual and include the social and economic cost of harm to families, communities and the wider society. Alcohol-related violence, child abuse, problems in the performance of family and parental roles, problems in work roles and of lost productivity are current examples of major alcohol-related social harms (Room, 2000; WHO, 2002; Room et al., 2010). Impact on personal wellbeing and health status in people exposed to heavy drinkers in their lives has also been recently noted (Casswell et al., 2011).

Recent research suggests a strong epidemiological association between alcohol consumption, especially heavy drinking, and incidence and clinical course of selected infectious diseases. More specifically alcohol consumption is strongly associated with increased incidence of tuberculosis (Lönnroth et al., 2008), pneumonia (Rehm et al., 2009c; Samokhvalov et al., 2010) and unsafe sex, which leads to an increased probability of

acquiring HIV through sexual transmission (Rehm et al., 2012). In addition, there is sufficient causal evidence that alcohol worsens the disease course of HIV/AIDS and can subsequently increase the likelihood of mortality, especially by impacting adherence to antiretroviral treatment (ART) (Hendershot et al., 2009; Azar et al., 2010; Baliunas et al., 2010; Gmel et al., 2011). Including infectious diseases in the list of alcohol-attributable disease categories will certainly change the contribution of alcohol consumption to the burden of disease, specially for Africa.

Three important mechanisms explain alcohol's ability to cause medical, psychological, and social harm (Babor et al., 2010). They are physical toxicity, intoxication, and dependence (Figure 4). In addition, the quality of alcoholic beverages may impact health outcomes and mortality, for instance via methanol or lead poisoning outbreaks.

Figure 4 - Model of alcohol consumption, intermediate outcomes and long-term consequences



Source: Babor *et al.* 2010

Alcohol is a toxic substance in terms of its direct and indirect biochemical effects on a wide range of body organs and systems. One such example are the direct toxic effects on acinar cells triggering pancreatic damage (Irving et al., 2009). Alcoholic beverages and the ethanol within them are classified as a carcinogen, increasing the risk of cancers of the oral cavity and pharynx, oesophagus, stomach, colon, rectum and female breast in a linear dose–response relationship (WHO, 2004a, IARC 1998; 2010). However, direct biochemical

effects of alcohol consumption may also have beneficial effects. These effects that disappear with heavy drinking occasions include the influence of low levels of drinking on ischaemic heart disease and ischaemic stroke by reducing plaque deposits in arteries and blood clotting formation (Zakhari, 1997; Rehm et al., 2004; 2010a) and in type 2 diabetes by an increase in insulin sensitivity (Hendriks, 2007; Klatsky, 2007).

Acute intoxication, resulting from the ingestion of substantial quantities of alcoholic beverages in a limited period of time, can lead to a wide range of adverse effects. At increasingly higher doses, alcohol leads to impaired coordination, reaction time, inhibition of movement, impaired balance, judgement, planning and thought processes, increasing the chances of accidents and injuries and interpersonal problems (Cherpitel et al., 2003; Room et al., 2005; WHO, 2007a). At very high doses, alcohol can cause impaired consciousness, coma, respiratory depression and death. Due to its disinhibiting effects that can affect decisions, alcohol consumption may result in unsafe sex and condom use accidents, with resulting transmission of HIV and other sexually-transmitted illnesses (STIs) (Kalichman et al., 2007; Baliunas et al., 2010; Woolf-King & Maisto, 2011). These effects place a significant burden on health care and emergency services, and cause harm to third parties.

With chronic drinking and repeated intoxication, a syndrome of interrelated behavioral, physical, and cognitive symptoms develops, called alcohol dependence (WHO, 2004a; Alcohol and Public Policy Group, 2010). Owing to its dependence-producing properties, alcohol influences behaviour just like any other addictive substance, including cocaine and heroin, both of which are under international control. Alcohol dependence develops primarily but not exclusively through the mechanisms of reinforcement or reward seeking, for example when the pleasure derived from drinking leads to continued need for alcohol. In fact, the direct actions of alcohol on the brain and repeated alcohol exposure lead to longer term molecular changes in the brain known as neuro-adaptation. This process occurs when repeated alcohol exposure provides the basis for tolerance and dependence by facilitating increased intake of alcohol by diminishing the aversive responses to alcohol (Babor et al., 2010, WHO, 2004a).

These three mechanisms are related to volume of alcohol consumed and to the ways in which people consume alcohol, called ‘patterns of drinking’ (WHO, 2007a). Drinking patterns that

lead to elevated blood alcohol levels result in problems associated with acute intoxication, such as accidents, injuries, and violence. Drinking patterns that promote frequent and heavy alcohol consumption are associated with chronic health problems such as liver cirrhosis, cardiovascular disease, and depression. Sustained drinking may not lead to much evident intoxication but can also result in alcohol dependence, which impairs a person's ability to control the frequency and amount of drinking.

Both the volume of lifetime alcohol use and a combination of frequency of drinking and amount drunk per drinking occasion increase the risk of alcohol-related harm, largely in a dose-dependent manner (Rehm et al., 2010a). Alcohol-related problems can sometimes be direct and immediate (like violence and accidents) or they can be the result of a complex process that may take years to become manifest (such as cancer and cirrhosis of the liver, which develop after years of sustained drinking). Alcohol consumption can have an impact not only on the incidence of diseases, injuries and other health conditions, but also on the course of disorders and their outcomes in individuals.

1.1.5. Alcohol-related harms

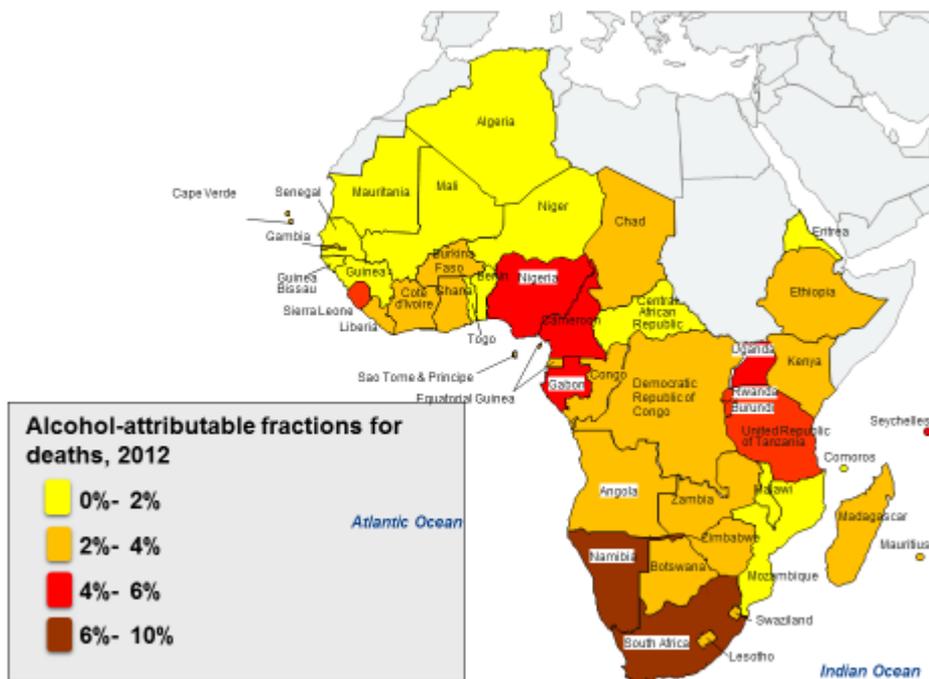
Alcohol is a recognized risk factor for morbidity and mortality globally, being responsible for one in every twenty deaths in the world. According to the World Health Organization, 5.1% of the global disease burden (measured as disability adjusted life years – DALYs) and 5.9% (or 3.3 million) of all deaths in 2012 were attributable to alcohol (WHO, 2014a).

In Africa, most of the existing data on alcohol-related mortality and burden of disease comes from global analyses. Estimations on total of deaths attributable to harmful use of alcohol in the WHO African Region show a significant burden of 2.2% in 2002 (WHO, 2007a) and 2.4% in 2004 (Rehm et al., 2009a). In 2012, alcohol was responsible for 3.3% of all deaths and 2.4% of all disability-adjusted life years (DALYs) lost in the WHO African Region (WHO, 2014a). Figure 5 shows estimates of the proportion of alcohol-related deaths in different countries in the African Region (WHO, 2014a).

Data from other global studies have also introduced important information on specificities of alcohol burden in Africa, notably a study published by Gore and colleagues (2011) that

identified alcohol as the leading risk factor for disability-adjusted life-years (DALYs) among African male adolescents aged 15–24 years. A more recent comparative risk assessment identified alcohol as the largest risk factor for death and disability in sub-Saharan Africa being associated with an increased risk of new HIV infections, tuberculosis, non-communicable diseases such as liver cirrhosis, some cancers and cardiovascular diseases, motor-vehicle traffic crashes, violence and injuries (Lim et al., 2012).

Figure 5 – Alcohol-attributable fractions (AAFs) for deaths from all causes, 2012 (as a percentage of all deaths).



Source: WHO, 2014a

In 2006, two articles specifically called attention to drinking and alcohol-related problems and to alcohol policies in Africa. Both concluded that consumption of commercial beverages was expected to increase and that effective policies were needed to address health and social problems related to alcohol consumption (Obot, 2006; Odejide, 2006). This was followed by a study on alcohol consumption in Sub-Saharan Africa that reported on estimates of alcohol consumption and attributable harm in comparison to worldwide estimates for the

year 2002 (Roerecke et al., 2008). It showed a level of adult per capita consumption higher than the global consumption rate (7,4 L vs. 6,2 L) and a 42% higher rate of consumption per adult drinker, with 2.2% of all deaths and 2.5% of DALYs attributed to alcohol. But one of the most important findings of this study was that intentional and unintentional injuries, especially from road traffic accidents, played a significant role in alcohol-attributable mortality (53%) and burden of disease (57%), an expected situation owing to high prevalence of heavy episodic consumption in the adult population (Roerecke et al., 2008).

More recently, new evidence has also emerged on the links between harmful use of alcohol and developmental issues like poverty and health inequities (Saxena, 1997; Blas & Kurup, 2010). Socioeconomic consequences attributable to the harmful use of alcohol are mostly related to stigmatisation, family disruption, low educational outcomes, loss of earnings, unemployment, and ultimately to poverty (Babor et al., 2015). The economic consequences of alcohol consumption are particularly severe for the poor that often are subject to increased medical expenses and more exposed to stigmatisation that contributes to reduced access to health and welfare services. Basically, the lower the socioeconomic status of a person within a country, the higher the alcohol-attributable disease burden (Rehm et al., 2009b).

The overall social and economic cost of alcohol consumption to society has been calculated for many developed countries showing substantial monetary costs. The costs associated with alcohol amount to more than 1% of the gross national product in high-income and middle-income countries, with the costs of social harm constituting a major proportion in addition to health costs (Rehm et al., 2009a). The greatest contributor to total alcohol-attributable costs in developed countries is the cost of productivity loss, followed by direct health-care costs. For the health sector, direct and indirect costs arise not only from the use of substance abuse treatment but also from the increased use of emergency services due to alcohol-related trauma, and the overuse of medical services due to alcohol-related medical complications (Xie et al., 1999; Parry et al., 2003; Møller & Matic, 2010). In South Africa, the first estimates from 2003 calculated social and economic costs at R8.7 billion, or 1% of the gross domestic product (Parry et al., 2003). More recently South Africa alcohol-attributable costs were estimated at 10 - 12% of the 2009 gross domestic product (GDP). The tangible financial cost of harmful alcohol use alone was estimated at R37.9 billion, or 1.6% of the 2009 GDP

(Matzopoulos et al., 2014). Other studies have also shown that in the African region, harmful use of alcohol leads to unemployment, increased admissions to health-care facilities, crime and violence, especially against women (Tumwesigye & Rogers, 2005; WHO, 2005a; Parry & Dewing, 2006).

1.1.6. Alcohol policies and public health

The work of several experts (Bruun et al., 1975; Babor et al 1993, 2003, 2010; Jernigan et al., 2000; Rehm et al., 2003; Bell et al. 2011; Room et al., 2005; Casswell & Tamarangsi, 2009; Beaglehole & Bonita, 2009; Room, 2011) and the resolutions at the World Health Organization on alcohol (e.g., WHO, 1983, 2005b; 2008b; 2010b) have contributed to the growing recognition of the role that alcohol plays in health and sickness in many countries across the world and have helped to frame alcohol consumption as a global public health issue.

This shift in frame, from an individual to a population/public health perspective –started in 1975 with the publication of the monograph *Alcohol control policies in public health perspective* (Bruun et al., 1975) that discussed the relationship between per capita alcohol consumption and alcohol-related harm. In their conclusions, the authors claimed that “changes in the overall consumption of alcoholic beverages have a bearing on the health of the people in any society. Alcohol control measures can be used to limit consumption – thus alcohol control availability becomes a public health issue” (Bruun et al., 1975).

The 25 years that followed this publication allowed major policy developments that consolidated this position and continued the trend to frame alcohol as a global health issue. Several WHO resolutions and reports framed alcohol as a major public health concern and described the importance of policies and programmes (WHO, 1979; 1983; 2004b; 2005b; Moser, 1974; 1980), and reduction of alcohol-attributable burden became a priority area for international public health (Jernigan et al., 2000). In 2008, sustained by Africa’s involvement, namely Kenya and Rwanda (Grimm, 2008), WHO was requested to formulate a global strategy (WHO, 2008b) and in 2010 the Global Strategy to Reduce the Harmful Use

of Alcohol was finally adopted at the WHA (WHO, 2010b), contributing to finally portray alcohol as a global health issue.

Besides framing alcohol consumption as a global health issue, the publication by Bruun and colleagues (1975) set the tone for the first definition of alcohol policies. In this monograph alcohol policies were defined as relevant strategies employed by governments or local administrative authorities to influence “availability of alcohol to the individual” (Österberg & Karlsson, 2003). This definition was expanded in 1994 capturing the intersections between science and alcohol policy. Alcohol policies were then defined as public health responses to alcohol related problems dictated in part by national and historical concerns (Edwards et al., 1996), meaning that a wealth of policy responses such as alcohol taxation, media information campaigns and school-based education were considered in this definition (Babor et al., 2010).

The definition of alcohol policy used by Bruun and colleagues (1975) and Edwards and colleagues (1996) was further broadened to cover all public policies pertaining to the relation between alcohol, health, and social welfare and the effectiveness of commonly used alcohol-abuse prevention strategies was also evaluated (Babor et al., 2003). Four dimensions were used in the evaluation: (1) evidence of effectiveness or the quality of scientific information; (2) breadth of research support, that is the quantity and consistency of the evidence; (3) extent of testing across cultures, e.g. testing in different countries or regions and within subgroups; and (4) cost to implement and sustain the strategy in terms of time, money and resources. Thirty-two strategies were classified into seven categories: regulating physical availability, taxation and pricing, altering the drinking context, education and persuasion, regulating alcohol promotion, drinking and driving countermeasures and treatment and early intervention. Out of the 32 strategies, ten were rated highly by the researchers and involved basically regulating the physical availability of alcohol (changing the minimum legal age limits for alcohol purchase, instituting a government monopoly on retail alcohol sales, instituting restrictions on hours and days of alcohol sale, instituting restrictions on density of alcohol outlets, increasing alcohol taxes), applying various drink-driving countermeasures (lowering blood-alcohol count limits, administrative license suspension, graduated licensing for novice alcohol users) and implementing brief interventions for hazardous drinkers.

Further findings by Chisholm and colleagues (2004), Österberg (2004) and by Anderson and colleagues (2009b) on cost effectiveness and effectiveness of policy interventions lent strong support to these results.

Another important revision to the policy options, was led by WHO. “Alcohol policy” was defined as the set of measures in a jurisdiction or society aimed at minimizing or preventing the health and social harms from alcohol consumption (WHO, 2007a). This revision formed the basis for the WHO report in 2007 to the World Health Assembly on “Evidence-based strategies and interventions to reduce alcohol-related harm” (WHO, 2007d) and later on to the WHO Global Strategy to Reduce Harmful Use of Alcohol and different publications (WHO, 2009a; WHO 2010b) aimed at policy implementation in countries, where each of these effective policy measures are described and updated.

In this thesis, the definition of alcohol policy is similar to the one used by WHO (WHO, 2007a; WHO 2010b). Alcohol policy is defined as public policies and measures that relate to alcoholic beverages, and have a bearing on health and social welfare issues. In the analysis of alcohol policies in African countries, the focus is set on examining national strategies and policies that have an effect on the level of alcohol consumption and alcohol-related harm in the society.

1.1.7. Effective alcohol policies

Research monographs (Österberg, 2004; Babor et al., 2010; Stockwell et al., 2005; Chikritzhs et al., 2007) and integrative reviews (Room et al., 2005; Anderson et al., 2009b; Babor et al., 2011; Nelson et al., 2013) have focused on the most effective policy approaches to reduce alcohol-related harm, either through regulatory measures that target per capita alcohol consumption, or through interventions targeted at high risk drinkers. Pricing and taxation policies, availability controls (e.g., outlet density, and days and hours of sales), drink-driving countermeasures (e.g., maximum blood alcohol concentration (BAC) limits of <0.05 g/dl), restrictions on alcohol marketing, specialized treatment for alcohol dependence,

and brief interventions for hazardous drinking have the most evidence of effectiveness (Österberg, 2004; WHO 2011b).

a) Pricing and taxation

Research suggests that alcohol consumption and related harms will decrease as the price of alcoholic beverages increases (Chaloupka et al. 2002; Fogarty, 2006; Gallet, 2007; Wagenaar et al., 2009). It also suggests that price also influences heavy drinkers and that young drinkers are especially responsive to price (Parry et al., 2003; Nelson, 2015). Increased alcohol taxes and prices are related to reductions in alcohol-related problems and mortality rates while at the same time they can be an important source of government revenues (Elder et al., 2010; Wagenaar et al., 2010). They include excise taxes on the volume of alcohol sold, minimum prices, bans on happy hours and so-called smart taxation, which is designed to shift consumption towards weaker types of alcohol (Meier et al., 2008; Stockwell et al., 2011). However, while there is evidence that high prices can lead to reduced consumption, it could also result in changes in drinking pattern with negative health and social impact. For example, high prices for commercial beverages can also lead to smuggling and illicit production, especially in countries lacking effective means of enforcement, as is the case in many African countries. Therefore, the effectiveness of policy changes in this area depends strongly on government oversight and on the establishment of efficient mechanisms to control alcohol production and distribution (Parry, 2005a; Babor & Caetano, 2005; Babor et al, 2010; Pitso & Obot, 2011).

b) Availability controls

Evidence from a variety of countries demonstrates that restrictions on time, place, and density of alcohol outlets reduce the demand for alcoholic beverages by increasing the time and effort to obtain alcohol (Room et al., 2005; Babor et al., 2010; Rossow & Norström, 2012). However, as pointed out by some researchers, in many African countries reducing hours of sale and instituting restrictions on outlet density is unlikely to be effective if unregulated outlets are not brought into the regulated market (Parry, 2009; Charman et al., 2013). Another example of a successful alcohol policy based on restricting physical availability, with substantial effects on youth drinking, is the enforcement of age restrictions on drinking through laws that raise the minimum legal purchasing age of alcohol (Wagenaar

& Toomey, 2002). The evidence is also clear that government-owned retail monopolies are a better option to limit alcohol consumption. These systems, that tend to have limited opening hours and fewer stores than systems of private sellers, represent a comprehensive alternative method to regulate alcohol availability, in contrast to licensing systems that with fees generated from licences can lead to a proliferation of licensed establishments as a mechanism to generate income for jurisdictions (Anderson et al., 2009b; Nelson et al., 2013).

c) Drinking and Driving Countermeasures

There is substantial evidence that laws establishing a reasonably low level of blood alcohol concentration (e.g., 0.05%) at which one may drive legally, combined with well-publicized enforcement, is effective in reducing drink-driving casualties (Tippetts et al., 2005; Anderson et al., 2009b; Babor et al., 2010). Another countermeasure that has been applied to reduce rates of driving-related casualties is to place certain restrictions on young or inexperienced drivers. These restrictions, which include a policy of zero tolerance (i.e., setting a BAC level as close to 0% as possible) and the use of graduated licensing for novice drivers (i.e., limits on the time and other conditions of driving during the first few years of licensing) (Shults et al., 2001; Shope, 2007) are seen as very important in African countries given the strong link between alcohol use and injury among young drivers (Parry, 2009). Although both interventions are effective, the effectiveness of Intensive Random Breath Testing (RBT) has been judged as being greater than for sobriety checkpoints in reducing alcohol-related injuries and fatalities (Shults et al., 2001). However, corruption, lack of workforce capacity and lack of strong administrative or legal systems capable of processing cases could reduce the effectiveness of this type of interventions in developing countries (Parry, 2005a; Stewart et al., 2012; Ditsuwan et al., 2013).

d) Education and Persuasion Strategies

The provision of education and information has been a popular approach to discourage drinking and prevent alcohol-related problems, especially among young adults. However, there is little evidence to support the position that they are an effective means to change drinking behaviour (Anderson, et al., 2009b).

e) Restrictions on Alcohol Marketing

Research shows the potential influence of exposure to alcohol marketing on early onset of drinking and the amount consumed by those already drinking (Smith et al., 2009; Anderson et al., 2009a; Gordon et al., 2010). Two recent studies have demonstrated a strong impact of alcohol marketing exposure on alcohol consumption by young people in African countries (Swahn et al., 2011; de Bruijn et al., 2013), where alcohol is portrayed as an emblem of success, and a symbol of heroism, courage and virility (Jernigan & Obot, 2006; Obot, 2013). The main ways to regulate alcohol marketing are by means of total bans (as done in Norway and France), partial restrictions, and voluntary self-regulation agreements with the alcohol industry (Babor et al., 2010). Research on the topic has not been very conclusive. Literature on partial restrictions has shown mixed results on the effectiveness of such strategies (Nelson, 2010; OPS, 2010). However evidence has shown that countries with greatest restrictions on advertising tend to have less drinking and fewer alcohol-related problems (Saffer & Dave, 2002; Cook et al., 2014). Recent studies have also shown that self-regulation tends to be ineffective and it is often circumvented (Babor et al., 2013; Vendrame et al., 2010) in countries where it is the only way to control alcohol advertising (de Bruijn et al., 2011).

f) Treatment and early intervention services

Extensive research in different countries has shown the effectiveness of early identification and brief advice for people with hazardous and harmful alcohol use (Moyer et al., 2002; Kaner et al., 2009; Anderson et al., 2009b; Babor et al., 2010; Wilson et al., 2011). However, research has also pointed that one of the challenges of implementing such approaches is that primary care practitioners lack training and time to conduct this type of interventions (Parry, 2005a; Peltzer, 2009b). As for treatment, research suggests that treatment is associated with significant reductions in alcohol use and related problems, regardless of the type of intervention used. However, the weight of evidence suggests that cognitive-behavioural interventions (which include relapse prevention skills) and motivational interviewing techniques are more effective than insight-oriented therapies (which explore psychological conflicts and the underlying causes of excessive drinking) in the treatment of alcohol use disorders (Raistrick et al., 2006). At the same time, treatment should be complemented by

pharmacological interventions, whenever needed, in order to address the neurobiological basis of alcohol dependence (Saitz & O'Malley, 1997; WHO, 2004a). Research also suggests that AA itself can have an incremental effect when combined with formal treatment, and that AA participation alone may be as effective as formal treatment is (Babor & Del Boca, 2002). Although alcohol policy measures can substantially affect alcohol consumption and alcohol-related harm, several other contextual factors also play a role. For example, increased drinking in Southeast Asian countries, where abstention rates have been traditionally high, seemed to be linked to rapid economic development and the parallel increase in consumers' purchasing power, as well as increases in the marketing of branded alcoholic beverages (Anderson, 2009b; Tang et al., 2013)

1.1.8. Establishment of an alcohol policy agenda in Africa

It was only in May 2006 that a first meeting with health representatives of African countries was organised to discuss alcohol consumption and its public health impact. This consultation, done under the auspicious of WHO, was convened as a follow-up to the adoption of Resolution WHA58.26 on Public Health Problems Caused by Harmful Alcohol Use (WHO, 2005b; WHO, 2007b). Although the primary goals of the consultation were to assess the situation related to alcohol consumption and their harmful consequences, the meeting also identified a number of factors that hindered the implementation of clear policies in various countries in the African region, including lack of awareness of the extent of the burden of alcohol consumption at the societal, community and individual levels, a perception that there were more urgent public health problems, such as HIV/AIDS and malaria that needed attention, and human resource constraints (competence and capacity) among others (WHO, 2007b).

In 2007, alcohol consumption was discussed for the first time at the WHO Regional Committee for Africa. In this meeting countries expressed concern about the impact of harmful use of alcohol on public health and emphasized the need to strengthen response in the Region (WHO, 2007c). In 2008, Kenya and Rwanda took an active role at the World Health Assembly, proposing a draft resolution that would lead to the call for a global strategy

(Grimm, 2008). In the same year at the WHO Regional Committee, countries called for a Regional Strategy (WHO, 2008a) and in 2010, Ministers of Health adopted the Regional Strategy to reduce harmful use of alcohol in the African Region” (WHO, 2010a). The strategy sets 10 policy options for effective action, including the three best buys for alcohol policy (price increases, limits on availability and bans on advertising) listed by the World Economic Forum and the World Health Organization in their joint submission to the 2011 UN high level meeting on non-communicable diseases (World Economic Forum, 2011)

In September 2011, countries committed themselves to reduce alcohol-related harm, among other risk factors for NCDs, at the United Nations General Assembly (WHO, 2012). This was followed by the endorsement of the WHO Global Action Plan for the Prevention and Control of Noncommunicable Diseases (NCDs) 2013–2020 at the 66th World Health Assembly in 2013 (WHO, 2013b). The Global Action Plan recognized the ten areas for action outlined in the Global Strategy to Reduce Alcohol-Related Harm adopted in 2010 by the World Health Assembly (WHO, 2010b) and set a target of at least a 10% relative reduction in the harmful use of alcohol, as appropriate, within each national context. In addition, it identified action in three areas – pricing, physical availability, and marketing – as very cost-effective (WHO, 2013b).

Despite these policy initiatives, and new evidence on alcohol’s adverse effects on health and development, the WHO Global Status Report on Alcohol and Health, published in 2011, found that only 13 of the 46 countries of the African region (28%) had a written and published alcohol policy (WHO, 2011a). Although the nature of this thesis was not to look for the underlying reasons for such a weak policy approach, it was felt that African governments and civil society organizations needed a more comprehensive analysis on alcohol burden to improve the actual policy approaches in the region.

1.1.9. Relevance of the theme

Contributions from the last Comparative Risk Assessment in the Global Burden of Disease analysis for 2010 showed the importance of alcohol as a risk factor in Southern sub-Saharan Africa (Lim et al., 2012) but additional epidemiological data on alcohol’s role in tuberculosis

and in the course of HIV/AIDS, especially important in low- and middle-income countries, have not been included in this analysis (Room, 2013). While priorities for research aimed at taking the alcohol and infectious diseases agenda forward have been identified (Parry et al., 2012b), no recent analysis on alcohol's adverse effects on health has been done for African countries.

In light of new evidence an analysis of alcohol as a public health risk in Africa is therefore needed. Are consumption and burden of disease increasing in African countries or are these stable? What is the impact of new research evidence on alcohol-related burden of disease? Are there factors driving changes in patterns of consumption? These questions have been the point of departure for my thesis. As they were raised, other questions came into play. Are countries prepared to address alcohol in its different perspectives? What are the responses available? Are they effective?

The work developed under this thesis builds on previous work on alcohol consumption and burden of disease in Africa (Obot, 2006; Roerecke et al., 2008) and on effective alcohol policies (Anderson et al 2009b; Babor et al., 2010) and aims at providing scientific evidence about alcohol consumption and harm in Africa to improve alcohol-related policy decisions in this region. The first study examines alcohol consumption and health effects; the second explores factors that could potentially affect the magnitude and patterns of drinking in African countries. The third one describes alcohol policies in 46 African countries and their effectiveness in controlling alcohol-related harm. Finally, the last study looks at challenges in policy development, describing the case of Malawi.

Why are such studies important and why do we need more knowledge in this area?

Governments need to enhance their understanding of the current situation in order to improve policy decisions. Describing the current alcohol consumption and related harm and identifying areas that might be contributing to changes in magnitude and patterns of consumption in Africa provides the opportunity to improve key policy interventions. At the same time, improved policy responses will of course lead to the prevention of alcohol-related harm and therefore reduce the number of alcohol-related deaths and burden of disease in Africa. Finally, evaluating the restrictiveness of alcohol policies in 46 countries in Africa

and examining concrete challenges of policy development will offer the opportunity to create an overview of how alcohol is governed and controlled in Africa.

Hopefully the studies included in my thesis will contribute to give alcohol the type of attention it deserves in the debate on major health risk factors for African countries. African governments will have an opportunity to look at the evidence linking harm with alcohol consumption and consider that government has a responsibility alongside that of individual citizens to implement policies that will protect the populations. I also hope that the important knowledge here produced can be used by relevant institutions and organisations to foster the technical and financial aid needed for development of strategies to prevent the growing burden of burden of disease and injury in the continent. This is a basic propose of this thesis.

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2. OBJECTIVES

2. OBJECTIVES

The overall aim of this thesis is to review evidence on alcohol consumption and alcohol-related policies, thus contributing to the improvement of alcohol-related policy decisions in this region.

To achieve this aim, the thesis concentrates on the following specific objectives:

- ▶ To estimate alcohol-attributable mortality and morbidity in Africa.

Study I: “The impact of alcohol in the people of Africa in 2012: an analysis of burden of disease”

- ▶ To identify factors that might affect magnitude and patterns of alcohol consumption in Africa.

Study II: “Alcohol and public health in Africa: can we prevent alcohol-related harm from increasing?”

- ▶ To evaluate national alcohol policy responses in 46 countries and their effectiveness to reduce alcohol-related harm.

Study III: “Alcohol control policies in 46 African countries: Opportunities for improvement”

- ▶ To document the different stages and actors involved in the development of the alcohol policy in one African country.

Study IV: “Alcohol policy process in Malawi: making it happen”

The thesis is therefore based on four papers, each with their background, methods, results and discussion sections.

3. RESULTS

Study I - The impact of alcohol in the people of Africa in 2012: an analysis of burden of disease

Carina Ferreira-Borges, Jürgen Rehm, Charles D.H. Parry, Sónia Dias, Thomas Babor

Manuscript (submitted)

Study I - The impact of alcohol in the people of Africa in 2012: an analysis of burden of disease

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Summary

Background The burden of disease attributable to alcohol is generally viewed as increasing in Africa but high-quality data to inform evidence-based policies are lacking. Because the interest in the topic has grown, and new risk relations have been established, it is important to determine the impact of alcohol consumption on deaths and disability in this region.

Methods We estimated alcohol exposure for 2012, and its impact on deaths and disability in Africa using estimates from the WHO Global Health Estimates for outcome data, and the WHO Global Status Report on Alcohol and Health 2014 for risk relations. In addition, we provide a scenario which includes the impact of alcohol HIV/AIDS incidence, and qualitative predictions on future exposure and harm.

Findings Overall, alcohol consumption has a large impact on burden of disease and mortality in African countries. Alcohol-attributable disease burden is however more important when the impact of alcohol-consumption on the incidence and course of HIV/AIDS is taken into account, with alcohol being responsible, in 2012, for 6,4% of all deaths and 4,7% of all DALYs in the African Region. Alcohol exposure is expected to increase in the next years, and thus alcohol-attributable fractions.

Interpretation The weight of new evidence, specially of alcohol's role in the incidence and course of HIV/AIDS is of special relevance to African countries and point to the need for a strong policy response to reduce alcohol-related burden in the continent.

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Introduction

Alcohol consumption has been shown to be one of the most important risk factors for burden of disease and injury globally^{1,2} as it is causally linked to chronic and acute health problems, in particular to cancer, cardiovascular diseases, digestive tract conditions, accidents, and violence.³ Africa is no exception from the global pattern. For instance, in 2004, alcohol was the leading risk factor for DALYs lost among African male adolescents aged 15–24 years.⁴ In sub-Saharan Africa, acute rather than chronic alcohol problems predominate, and unintentional injuries account for most of the alcohol-attributable deaths and disability-adjusted life years (DALYs) in the region.⁵

This can be explained by high prevalence of heavy episodic consumption and a detrimental pattern of use where large quantities of drinks are consumed frequently, in a short space of time and outside of meals⁶ that, as explained elsewhere, increases risk for some disease and all injury outcomes.³

While the nexus between alcohol use and road traffic injuries is more easily recognized and generally accepted, connections between alcohol and infectious diseases are generally unrecognized and/or poorly addressed in Africa. In a recent study Rehm and colleagues⁷ estimated that alcohol-attributable infectious diseases increased alcohol-attributable burden of disease by 50% in Africa. Despite the mounting evidence⁸⁻¹⁰, the importance of alcohol as an important risk factor for infectious diseases such as HIV and tuberculosis is still neglected. As a result, many countries with heavy HIV and alcohol burdens do not fully recognize these epidemics as intrinsically interrelated and therefore miss important intervention opportunities.¹¹

Absence of recognition can be related to various factors including the initial lack of consensus around alcohol-HIV causal links and to the lack of clear estimates of the impact of alcohol on HIV, especially for Africa. Deriving estimates of alcohol's role in the burden of death and disease, includes evaluating the existing evidence for a causal impact of the dimensions of alcohol on different categories of disease as a first step, and thereafter conducting meta-analyses to quantify the corresponding dose-response relationships.³ Major disease categories causally linked to alcohol and conditions to which alcohol use is a contributing factor have been previously identified^{12,13} and used to assess alcohol-related burden of disease in important epidemiological exercises such as the Global Burden of Diseases, Injuries, and Risk Factors Study 2004 and 2010.

In this paper we present the current epidemiological situation regarding alcohol and disease burden in Africa. Specifically, we will give details on alcohol exposure for the year 2012, and its impact on deaths and disability, using estimates from the WHO Global Health Estimates for outcome data and the WHO Global Status Report on Alcohol and Health for risk relations. In addition, we present a scenario which includes the impact of alcohol on HIV/AIDS incidence, and some considerations on future developments on exposure and harm for 2025.

Methods

Alcohol exposure for the year 2012 was as computed for the Global Status Report on Alcohol and Health 2014.² The details of obtaining country specific alcohol exposure estimates had been described in detail in the GSRAH and elsewhere¹⁴, and the same general methodology was used in

the GBD 2010 Study.^{1,15} The methodology is unique as it combines a systematic review of the literature with a validation of the resulting data by the respective country focal points via mechanism established by the regional offices of the World Health Organization.

Alcohol-attributable burden calculations also followed the GSRAH 2014² with exception of the sensitivity analyses for HIV/AIDS which is described in detail below. The methodology for alcohol-attributable burden calculations is identical between GSRAH and GBD 2010 with two exceptions: the GSRAH included harmful use of alcohol/alcohol abuse within the alcohol use disorders (the omission of which had been an oversight of the GBD¹ and it included the impact of alcohol consumption on HIV/AIDS mortality due to lack of adherence to medication.¹⁶

With respect to inclusion of the impact of alcohol consumption on incidence of HIV/AIDS for the sensitivity analysis, we derived attributable fractions based on the risk relations from the meta-analyses of the association between different dimensions of consumption and incidence of HIV.¹⁰ To be conservative and account for additional confounding, the effect sizes were halved (see Peto et al¹⁷ for a similar procedure used in his classic study on the impact of tobacco smoking on lung cancer). Causality has been established via experimental studies on alcohol consumption and the proxy measures of intention to engage in unsafe sex.¹⁸ A full list of all wholly or partially alcohol-attributable disease categories modelled, their ICD codes and the references for risk relations can be found in Web Appendix 1.

Results

Alcohol consumption

Data presented in Table 1 show the percentage of male and female alcohol abstainers, per capita consumption of recorded and unrecorded alcohol, the percentage of former drinkers and the average of consumption per drinker, and the percentage of heavy episodic drinking for the African Region, except Somalia (country level data can be found in Web Appendix 2).

High rates of abstention are a clear feature of alcohol consumption in this region. In many countries, i.e., Algeria, Chad, Comoros, Ethiopia, Madagascar, Malawi, Mali, Mauritania, Niger, Senegal, more than 80% of the adult population, as defined by ages 15 years or older, did not consume alcohol in 2012.

Table 1: Indicators of alcohol consumption for WHO African region – 2012

Derived from routine statistics	Per capita consumption	Recorded	Unrecorded	Tourist	Per capita per drinker
Men	9.28				23.11
Women	2.66				13.61
Total	5.94	4.17	1.77	0.00*	19.96
Survey derived	Current drinkers	Lifetime abstainers	Former drinkers	HED in population	HED among drinkers
Men	40.2%	45.8%	14.0%	9.3%	23.1%
Women	19.6%	68.9%	11.5%	2.1%	10.7%
Total	29.8%	57.5%	12.7%	5.6%	19.0%

* Tourist consumption was only measured for countries, where the number of tourists exceeded the number of inhabitants (Botswana, Seychelles, Swaziland – for methodology see WHO (2014)), which amounted to overall negligible amounts for the region as whole

The overall adult per capita consumption of pure alcohol was about 6 litres of absolute alcohol in this year (5.9 litres), with 30% being unrecorded, i.e., not registered by routine national statistics¹⁹. However, levels of consumption varied widely, ranging from 0.2 litres adult per capita in Comoros to 11.0 litres in South Africa (see Table 2).

Table 2: Adult per capita consumption and Adult per capita consumption among drinkers in WHO African region (by country)

Country	PCA					PCA (Current drinkers)		
	Recorded	Unrecorded	M	W	Total	M	W	Total
Angola	7,1	1,9	14,6	3,7	9,0	30,4	15,6	25,4
Burundi	6,1	2,9	13,5	4,7	9,0	25,7	14,6	21,4
Benin	1,1	1,0	3,4	0,9	2,1	7,0	2,9	5,4
Burkina Faso	4,3	2,5	11,2	2,8	6,8	22,7	10,1	18,0
Botswana	5,2	2,7	12,8	2,3	7,5	22,8	8,5	18,2
Central African Republic	1,7	2,0	5,7	1,9	3,7	18,3	15,6	17,5
Cote d'Ivoire	3,8	1,9	9,5	1,8	5,8	26,7	17,6	24,8
Cameroon	5,9	2,7	13,6	3,5	8,6	25,5	10,7	19,8
Democratic Republic of the Congo	2,8	1,5	6,9	1,8	4,3	16,7	12,0	15,4
Congo	1,8	2,4	6,7	1,7	4,2	15,8	11,2	14,6
Comoros	0,1	0,1	0,4	0,1	0,2	2,1	1,5	1,9

Cape Verde	3,4	2,4	9,5	2,3	5,8	19,4	8,0	15,1
Algeria	0,4	0,2	1,0	0,3	0,6	7,2	5,2	6,7
Eritrea	0,4	0,6	1,7	0,3	1,0	3,7	0,7	2,3
Ethiopia	0,7	3,5	6,2	2,2	4,2	30,3	20,0	26,6
Gabon	9,3	2,1	17,9	4,7	11,3	34,5	15,6	27,5
Ghana	1,9	3,0	8,0	2,0	4,9	24,2	14,2	21,1
Guinea	0,2	0,5	1,5	0,1	0,8	11,8	1,5	8,8
Gambia	2,5	1,0	5,7	1,4	3,5	35,4	23,3	31,9
Guinea-Bissau	2,1	1,3	5,4	1,4	3,3	12,2	8,5	11,2
Equatorial Guinea	4,4	0,6	7,7	2,2	5,0	15,2	7,7	12,6
Kenya	1,8	2,5	7,3	1,3	4,3	22,7	9,6	18,8
Liberia	3,0	1,5	7,1	1,9	4,5	17,1	10,0	14,9
Lesotho	2,9	3,8	11,2	2,6	6,7	26,6	13,9	22,5
Madagascar	0,9	1,2	3,3	0,8	2,0	15,5	11,5	14,5
Mali	0,6	0,5	2,3	0,0	1,2	37,7	2,9	30,4
Mozambique	1,1	0,9	3,1	1,0	2,0	11,4	10,2	11,0
Mauritania	0,0	0,1	0,2	0,0	0,1	6,5	1,4	4,7
Mauritius	2,7	1,0	6,0	1,5	3,7	13,5	7,3	11,6
Malawi	1,4	0,9	4,2	0,5	2,3	14,9	4,3	12,0
Namibia	7,7	4,5	19,0	6,2	12,2	38,5	20,7	31,4
Niger	0,1	0,2	0,5	0,1	0,3	6,1	4,5	5,7
Nigeria	8,5	0,9	14,1	4,8	9,5	24,2	16,7	21,8
Rwanda	7,0	3,1	15,6	5,1	10,1	28,0	14,7	22,6
Senegal	0,2	0,3	1,0	0,1	0,5	10,0	6,6	9,5
Sierra Leone	6,9	2,0	14,3	3,7	8,9	25,9	10,7	19,9
Sao Tome and Principe	3,8	2,6	10,5	2,6	6,4	21,2	9,5	16,9
Swaziland	4,9	1,0	10,5	1,1	5,6	19,2	3,2	12,9
Seychelles	2,8	0,9	5,2	1,4	3,3	9,4	4,3	7,5
Chad	0,4	4,1	7,2	1,9	4,5	38,0	25,1	34,3
Togo	1,2	0,9	3,5	0,9	2,2	5,1	1,5	3,4
United Republic of Tanzania	5,7	2,0	11,4	4,0	7,7	21,8	12,6	18,3
Uganda	8,0	1,5	14,0	5,0	9,5	24,9	19,0	23,0

South Africa	8,1	2,8	18,3	4,2	11,0	32,6	15,9	26,9
Zambia	2,7	1,6	6,9	1,7	4,3	15,5	10,2	14,1
Zimbabwe	4,1	0,9	9,4	0,7	4,9	18,7	2,6	12,7
Africa WHO region	4,2	1,8	9,3	2,7	5,9	23,1	13,6	20,0

Another characteristic of alcohol consumption in this region is the high volume consumed per alcohol user. On average, alcohol consumption per drinker was at a markedly high level, reaching about 20 litres of pure alcohol per year. In countries like Chad, Gambia, Mali or Namibia consumption among drinkers reached higher than 30 litres of pure alcohol per year.

Alcohol-attributable burden of disease

Overall, alcohol consumption had a large impact on burden of disease and mortality in the WHO African region. Table 3 gives more details on the composition of alcohol-attributable burden in the WHO African region. Gastrointestinal diseases (especially liver cirrhosis), infectious diseases (lower respiratory infections and tuberculosis) and unintentional injury were the disease categories most importantly affected by alcohol consumption. For women, cardiovascular disease were also important, proportionally more for death than for disability.

The biggest difference between deaths and DALYs as outcome were neuropsychiatric disorders, in particular alcohol use disorders. While these disorders have been associated to considerable mortality²⁰, most of the death certificates do not show alcohol use disorders as cause of death, but other causes.²¹ In addition, alcohol use disorders are highly disabling resulting in hundreds of thousands of years of life lost²². For men, 224 thousand deaths corresponding to 4.6% of all deaths (see Table 4 below); and 12.5 million DALYs (3.6% of all DALYs; see Table 5) in 2012 were due to alcohol consumption. Given the higher rate of abstainers and the more favorable patterns of drinking (see Table 1), the burden for women was lower, but still high: mortality more than 80 thousand deaths (1.8%; see Table 4) and more than 3.5 million DALYs (1.1%; see Table 5). These figures do not yet include the impact of alcohol consumption on the incidence and course of HIV/AIDS except for the disrupting of the medication schedule.

Table 3: Alcohol-attributable deaths and burden of disease in WHO African region by sex and major disease categories

	Deaths				Burden of disease in DALYs			
	Men	% ¹	Women	% ¹	Men	% ¹	Women	% ¹
Cancer	11,177	5.0%	7,768	9.7%	403,867	3.2%	297,080	8.4%
Cardiovascular disease	17,811	7.9%	16,206	20.1%	538,962	4.3%	495,210	14.1%
Gastrointestinal disease	51,931	23.1%	23,556	29.3%	2,170,603	17.3%	898,522	25.5%
Neuropsychiatric disorders	8,664	3.9%	2,985	3.7%	2,412,235	19.2%	509,264	14.5%
Infectious disease	49,100	21.9%	22,432	27.9%	2,113,721	16.9%	824,887	23.4%
Intentional injury	53,779	24.0%	6,952	8.6%	2,998,013	23.9%	357,313	10.1%
Unintentional injury	30,764	13.7%	2,550	3.2%	1,776,824	14.2%	138,035	3.9%
Other ²	1,154	0.5%	-1,978	-2.5%	123,106	1.0%	220	0.0%
Total	224,381	100.0%	80,470	100.0%	12,537,330	100.0%	3,520,532	100.0%

¹ Proportion of all alcohol-attributable deaths or DALYs

² Other diseases comprise diabetes and preterm birth

Regional and country differences

The burden of alcohol consumption is not distributed equally between countries and regions. Three main determinants impact on this burden: the proportion of people with Muslim faith, economic wealth and the prevalence of HIV/AIDS. Tables 4 and 5 show the different regions (for a categorization of countries to regions see Web Appendix 3).

Table 4: Alcohol-attributable deaths by region in 2012

Region	Alcohol-attributable deaths		% of all deaths		Crude rate per 100,000 population	
	M	W	M	W	M	W
West	97,886	38,358	4.7%	2.0%	54.5	21.7
Central	23,315	7,868	3.3%	1.2%	48.0	16.0
East	69,943	27,521	4.1%	1.8%	38.9	15.2
South	38,153	7,497	8.9%	1.9%	106.3	19.9
Other	4,376	1,981	2.1%	1.1%	13.9	6.3
WHO Afr	224,381	80,470	4.6%	1.8%	50.3	18.0

Table 5: Alcohol-attributable burden of disease in DALYs by region in 2012

Region	Alcohol-attributable DALYs		% of all DALYs		Crude rate per 100,000 population	
	M	W	M	W	M	W
West	5,291,789	1,692,758	3.4%	1.2%	2944.1	957.0
Central	1,432,547	360,600	2.7%	0.7%	2950.7	732.8
East	3,841,615	1,128,769	3.2%	1.0%	2134.9	624.3
South	2,171,967	363,311	8.8%	1.6%	6049.9	962.3
Other	231,713	76,912	1.8%	0.7%	733.6	246.2
WHO Afr	12,537,330	3,520,532	3.6%	1.1%	2810.2	788.7

As shown in Figure 1, clearly southern sub-Saharan Africa, and specifically South Africa) has the highest alcohol attributable burden, when considering the rate per 100,000 population. The least burden was found in the category labelled “Other”, which comprised Algeria (a Muslim country), and the islands in the Indian Ocean.

Sensitivity analyses taking into consideration the impact of alcohol consumption on incidence and course of HIV/AIDS

The picture changes when the impact of alcohol consumption on both the incidence and disease course of HIV is taken into account in the African region. This will add 60,509 male and 34,802 female deaths (in 2012), and the proportion of all deaths attributable to alcohol will rise to 5.9% of all deaths for men (from 4.6%), and 2.6% of all deaths for women (from 1.85%). The relative impact of adding alcohol-attributable HIV deaths is larger for women: while the numbers for men increased by 27.0%, the numbers for women increased by 43.2%. The southern part of sub-Saharan Africa can be characterized by a huge proportion of HIV/AIDS deaths, and a risk factor like alcohol which accounts for 11.7% of all HIV/AIDS deaths in men, and 6.1% of these deaths in women, makes an important contribution to the overall deaths.

With respect to DALYs lost, a similar picture emerges. About 3.7 million HIV/AIDS DALYs in men and 2.15 million DALYs in 2012 were caused by alcohol consumption. This means that the proportion of all burden of disease in DALYs attributed to alcohol in the African Region will rise to 4.7% of all DALYs for men (from 3.6%), and 1.8% of all DALYs for women (from 1.1%). As

with death rates, the relative impact of adding alcohol-attributable HIV burden is larger for women: while the numbers for men increased by 29.4%, the numbers for women increased by 61.2%.

Future developments

With respect to future developments, alcohol consumption is predicted to rise further in the African region in the next ten years², with exact growth rates depending on economic growth.^{7,23} Moreover, most of the alcohol-attributable causes of death and burden of disease is predicted to relatively gain in importance (see WHO Global Health Estimates predictions for 2025; http://www.who.int/healthinfo/global_burden_disease/en/), except for HIV/AIDS and other infectious diseases. However, the latter predictions have large confidence intervals, as trends for HIV/AIDS in sub-Saharan Africa are extremely hard to predict. Given the high importance of infectious disease outcomes among all alcohol-attributable diseases, the overall impact of alcohol in Africa will depend crucially on future trends for these diseases. For all other disease categories, because of the predicted increase in per capita exposure, the alcohol-attributable fractions will increase in the next 10 years.

Figure 1 : Alcohol-attributable burden in the WHO African Region

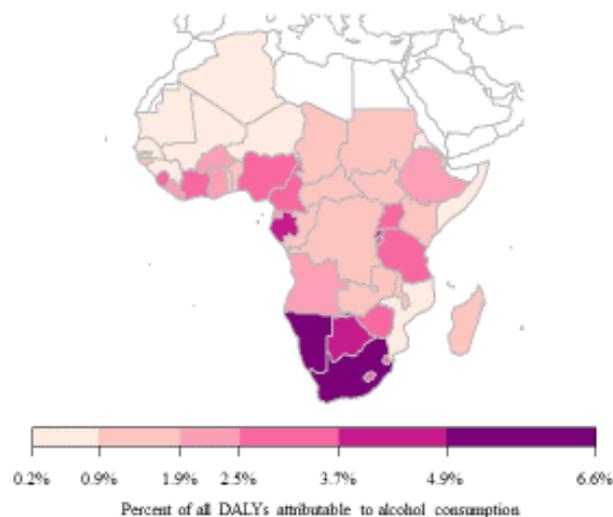


Figure 1. Total

Discussion

Our study provides data on alcohol's contribution to the burden of disease in Africa in 2012. The methodology underpinning this analysis was based on the current international standard approach, using methods developed in the Comparative Risk Analyses for the Global Burden of Disease. Findings show that although only one third of the African population drinks alcohol, considerable harm is done through alcohol consumption. The amount consumed per drinker is nearer to about 20 litres of absolute alcohol consumed per year – the second highest in the world. Overall, and when taking into consideration the impact of alcohol consumption on incidence and course of HIV/AIDS, alcohol consumption has a large impact on burden of disease and mortality in African countries, with alcohol being responsible, in 2012, for 6,4% of all deaths and 4,7% of all DALYs in the African Region. Our findings indicate that this burden of mortality is non-trivial (and even higher than the global alcohol-attributable death rates), and demand a stronger response from countries to address the consequences of excessive alcohol consumption.²⁴ They also show that the issue of what is or is not included in the final risk factor analysis has major policy relevance, especially for Africa where about 65.9% of all adults living with HIV are located.²⁵

Our findings are in line with results found in previous studies showing that though the per capita consumption of alcohol in Africa is generally low compared with consumption in Europe, the way that people drink causes substantial harm and contributes to an increased mortality and morbidity.⁶ ²⁶ How alcohol is consumed by drinkers in a country is an important determinant of the type and levels of problems associated with drinking. Additionally, the lower the socioeconomic status of a person within a country, the higher the alcohol-attributable disease burden per litre of pure alcohol.⁷

These figures present a higher number of deaths and DALYs attributable to alcohol in the region than that previously estimated by Roerecke for 2002²⁶ (2,2% of all deaths and 2,5% of all DALYs) and by WHO for 2012² (3,3% of all deaths and 2,4 % DALYs). These changes reflect the introduction of infectious diseases and are consistent with previous evidence showing that alcohol consumption and specially heavier dinking patterns is linked with many facets of HIV disease, such as unsafe sex, which leads to an increased probability of acquiring HIV through sexual transmission^{9, 16, 18}, reduced adherence to antiretroviral treatment (ART)²⁷, immune system impairment and drug interactions and hepatotoxicity.¹¹ Other recent studies have also called the attention to the significant impact of alcohol consumption on the incidence and progression of tuberculosis (TB) and lower respiratory infections (LRI), especially in developing countries.¹⁵ Besides the fact that alcohol weakens the immune system and affects medication adherence, in many African countries, important

social factors like housing, drinking in crowded, poorly ventilated environments and communal drinking increase the risk of catching TB and LRI⁷. Infectious diseases are not only more common (in terms of both incidence and prevalent) in southern Sub-Saharan African countries, but also more common in poorer populations within these countries. This explains why, in countries with overall high incidence or prevalence of infectious diseases and relatively high consumption of alcohol, such as in southern Africa alcohol contributes over-proportionally to disease mortality (9% of all deaths). They are also higher when compared with global figures. The World Health Organization² recently ranked alcohol consumption third as a risk factor for global burden of disease behind child underweight and unsafe sex, accounting for 5.9% of all global deaths and 5,1% of the global burden of disease and injury.

In terms of gender differences, the results here reported are similar to what traditionally has been reported from other parts of the world.² Alcohol has caused much more health burden for men than for women – the alcohol-attributable proportion of men’s overall burden was about four times the proportion of women’s. This may be due to the fact that men not only drink more but also engage in heavy drinking episodes. Alcohol weakens inhibitions and due to norms/expectations males are more likely to act out – violently or in terms of risky sexual behavior. More women than men are abstainers; however, as countries develop, the difference between men and women is likely to disappear.⁶

In line with the above, we believe that stronger policy responses are needed in African countries. First of all, population wide approaches such as those linked with reduction of alcohol availability, advertising restrictions and drink and driving as a way of protecting young people and preventing injuries. Secondly, individual-based interventions such as brief interventions, can have a notable impact in reducing alcohol consumption and related harm. Additionally the potential value of introducing alcohol-related preventive measures in primary public care or in HIV clinics, aimed at reducing alcohol consumption among people with HIV/AIDS or TB has already been noted.²⁸

We also believe that not including this evidence in future analysis can affect the policy implications resulting from GBD studies – both by under-estimating the burden attributable to alcohol use and second, by under-estimating or ignoring the effect of alcohol on infectious disease. This could result in less attention (and funding) being given to implementing alcohol-related interventions, specifically aimed at addressing alcohol related TB and HIV.

We recognize several limitations in this study. First of all, burden of disease and mortality estimates are based on the best data available. While the overall data availability has improved since the first

BoD study, Africa certainly still is the part of the world with the highest uncertainty of data due to lack of vital registration in many parts. Estimates are derived using different sources and risk relations used to estimate the burden of disease come essentially from developed countries and therefore may not hold true for Africa, especially since alcohol has synergistic effects with other risk factors such as malnutrition or socio-economic status.^{29,30} A specific problem for Africa is the high level of unrecorded consumption which production, mainly homemade, is not covered in official statistics¹⁹.

Conclusion

Our results reinforce the evidence that alcohol is a major contributor to burden of disease in Africa. Although high rates of abstention are a clear feature of alcohol consumption in this region, in some countries the average alcohol consumption per drinker is at a markedly high level, therefore contributing to high alcohol-attributable fractions of mortality and morbidity. Moreover, by providing a summary of the evidence on alcohol-related burden, especially on alcohol's role in the incidence and course of HIV/AIDS, our results highlight the enormous public health burden attributable to alcohol consumption and point to the need for a strong policy response to reduce alcohol-related burden in the continent.

Conflicts of interest

The authors declare no conflicts of interest. Part of the calculations for the WHO Global Status Report on Alcohol and Health were conducted as work of the WHO Collaborating Centre on mental health and addictions situated at the Centre for Addiction and Mental Health, which is headed by JR.

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Study II - Alcohol and public health in Africa: can we prevent alcohol-related harm from increasing?

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Alcohol and public health in Africa: can we prevent alcohol-related harm from increasing?

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ABSTRACT

Aims According to the World Health Organization (WHO), the total amount of alcohol consumed in the African region is expected to increase due to the growth of new alcohol consumers, especially young people and women. With the changing alcohol environment, increases in the alcohol-attributable burden of disease are inevitable. To our knowledge, there has not been a comprehensive analysis of the factors that could be driving those increases. The objective of this study was to examine the evidence from peer reviewed literature regarding the factors that could be instrumental in this process, in order to inform strategic policy-related decisions. **Method** A narrative review was conducted using a thematic analysis approach. We searched papers published between January 2000 and July 2014 in PubMed, the WHO's Global Health Library and African Journals Online. **Results** Our analysis identified seven factors (demographics, rapid urbanization, economic development, increased availability, corporate targeting, weak policy infrastructure and trade agreements) which are potentially tied to changes in alcohol consumption in Africa. Driven largely by globalization, a potential convergence of these various factors is likely to be associated with continued growth in alcohol consumption and alcohol-related morbidity and mortality. **Conclusions** To address the emerging risk factors associated with increased alcohol consumption, African governments need to take a more active role in protecting the public's health. In particular, important strategic shifts are needed to increase implementation of intersectoral strategies, community involvement in the policy dialogue, health services re-orientation and better regulation of the alcohol beverage industry.

Keywords Africa, alcohol availability, alcohol consumption, alcohol policies, alcohol problems, economic development, emerging markets.

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INTRODUCTION

Alcohol has been identified as a leading risk factor for death and disability in sub-Saharan Africa [1]. Despite the fact that most of the population still abstains from drinking, the average quantity consumed by drinkers per year is the second highest in the world (19.5 litres of pure alcohol per year), with similar proportions of heavy episodic drinking found among adolescents and the total population [2]. As of 2012, alcohol contributed to 3.3% of all deaths and 2.4% of all disability-adjusted life years (DALYs) lost in the African region [2]. The World Health Organization (WHO) predicts that alcohol per capita consumption (APC) (i.e. the volume of alcohol consumed by each individual aged 15 years or older, on average) may remain constant in this region; however, a growth in the total amount of alcohol consumed is expected due to increases in the number of potential new alcohol consumers, especially young people and women [2]. With the changing alcohol environment in Africa, increases in the alcohol-attributable burden of disease are also expected.

Previous studies, mainly from high-income countries, have identified a variety of factors affecting the magnitude and patterns of alcohol consumption, both at the individual and the societal levels [3,4]. The ongoing dialogue about the rising epidemic of non-communicable diseases (NCDs) at the global level, as well as in Africa, has helped to shift the discussion from ‘individual choices’ to an explanation more focused on the role of the social environment and globalization in the proliferation of NCDs [5–7]. At the global level, some factors contributing to changing patterns of alcohol consumption, such as the level of economic development, the expansion of global alcohol producers and changes in life-styles, have been discussed – and substantial efforts have been made to analyze and document the influence of such factors [1,8–10]. In Africa, two reviews on alcohol problems have identified some of these factors [11,12]. Determinants such as urbanization, industrialization and marketing were implicated in increased alcohol consumption. Another study, covering 20 African countries, called attention to the role of religion as an additional factor influencing country drinking patterns [13]. More recently, a narrative review focused on alcohol industry activities in Africa suggesting that pricing, marketing,

product design and lobbying activities can all increase availability and therefore influence consumption [14]. The Minister of Health’s proposal to introduce an alcohol marketing ban in South Africa in 2010 has led to extensive, and at times acrimonious, public debate in South Africa on the association between industry activities and increases in consumption [15]. In a recent African Union/WHO joint meeting, ministers identified the globalization of alcohol-related marketing and trade liberalization as significant contributors to increases in NCDs [16].

It is worth noting that while recent research points to several factors that may contribute to increases in alcohol consumption in Africa, to our knowledge there has not been a comprehensive analysis of factors that could be instrumental in driving those increases. Furthermore, due to their nature it is possible that the synergistic confluence of these factors might leave several countries in Africa exposed to a gathering storm of epidemic proportions. In the light of the above, we set out to examine the evidence from peer-reviewed literature regarding factors potentially affecting alcohol consumption and the alcohol policy environment in Africa using a narrative review and thematic analysis approach [17].

METHODS

A deductive procedure was used in our review and a categorization matrix [18] was developed based on existing frameworks or previously identified factors [2,19,20]. All papers were read thoroughly by research team members (C.F.-B. and S.D.) and meaning units, giving suggestions on factors affecting consumption, were extracted.

Search strategy

We searched papers published between January 2000 and June 2014 in PubMed databases, the WHO Global Health Library and African Journals Online (AJOL). The search was not limited by language of publication. We used a combination of the following keywords: ‘alcohol drinking’, ‘alcohol consumption’, ‘alcohol policy’, ‘Africa’, ‘African’. To increase validity, we searched relevant papers and books manually, including publications by the WHO and reports of alcohol-related scientific conferences that occurred in Africa during that period.

Data extraction and thematic categorization

Titles and abstracts of 6658 identified records were re-viewed for relevance according to the following inclusion criteria: (a) provided evidence or discussed factors affecting alcohol consumption and (b) referred to the alcohol policy context in African countries or in other low- and middle-income countries. We removed 3432 duplicates, and with-out further review excluded 3035 papers based on their title and abstract, leaving 191 papers for the complete analysis. Decisions on whether to include a paper were based on critical evaluation of the contribution of the paper to the topic, and not on methodological standards [21]. Be-cause they did not meet the inclusion criteria or inability to access the paper, we excluded 112 papers. The remaining 79 records met all the inclusion criteria and were included in the analysis [see Fig. 1 for the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart [22]. Two research team members (C.F.-B. and S.D.) compared the themes extracted from each study to develop consensus and resolved disagreements by discussion.

RESULTS

Seven overarching themes emerged from our review of factors potentially affecting alcohol consumption and the alcohol policy environment. We describe each of these themes in the following sections. Because demographics and urbanization are so closely linked in the literature, we present them together.

Increased physical and economic availability

Availability is the most cited theme in our analysis (n = 31). Issues raised around this theme include the easy access and low prices of traditional alcoholic beverages, the inability to regulate informal outlets [23], taste improvements and the introduction of new product lines, using locally produced beverages [24] and agreements between the alcohol industry and some African governments to give tax breaks for beverages made from locally grown products, making them cheaper [14,25]. Several studies report that marketing expenditures are associated with increased social acceptance of drinking and the recruitment of new drinkers, particularly women, from former abstainers [12,26–29,39]. Two studies demonstrate a strong impact of alcohol marketing

exposure on alcohol consumption by young people [30,31].

Corporate targeting and corporate social responsibility activities

The second most-cited theme in this analysis relates to corporate interests of international alcohol producers (n = 30). Studies describe the involvement of the alcohol industry in countries' policymaking process, corporate philanthropy and corporate social responsibility activities, which are designed to protect commercial interests and therefore increase the availability and consumption of alcoholic beverages [32–34,54]. In addition to the increasing involvement of transnational alcohol corporations in the development of public health policies in Africa [35], the literature we reviewed calls attention to the fact that the number of industry-funded studies, books and other scientific publications is also increasing, thereby creating a situation where conflict of interest begins to compromise the credibility of scientific information [36,37].

Policy infrastructure and regulatory framework

Several records refer to the absence of adequate policy infrastructures and strategies in Africa, which are necessary to guide and refine alcohol policy development in the region (n = 29). Institutional and human capacity, surveillance systems and research capable of generating appropriate epidemiological evidence are important but underdeveloped categories [11,38]. Other factors hindering implementation of evidence-based policy are the lack of concern for alcohol's contribution to health and social harm [39], the strong influence of the alcohol industry, as noted recently in countries such as South Africa [40–42] and Malawi [43], the lack of coherence between policies within government sectors [44] and the absence of intersectoral platforms and community involvement in the policy dialogue [45].

Economic development

Several of the records that document economic growth as an important factor for changes in alcohol consumption in Africa indicate increased alcohol availability as a direct outcome of such growth (n = 18). Two main ways in which economic development impacts alcohol consumption were identified. First, higher incomes are related to higher levels of alcohol consumption [46].

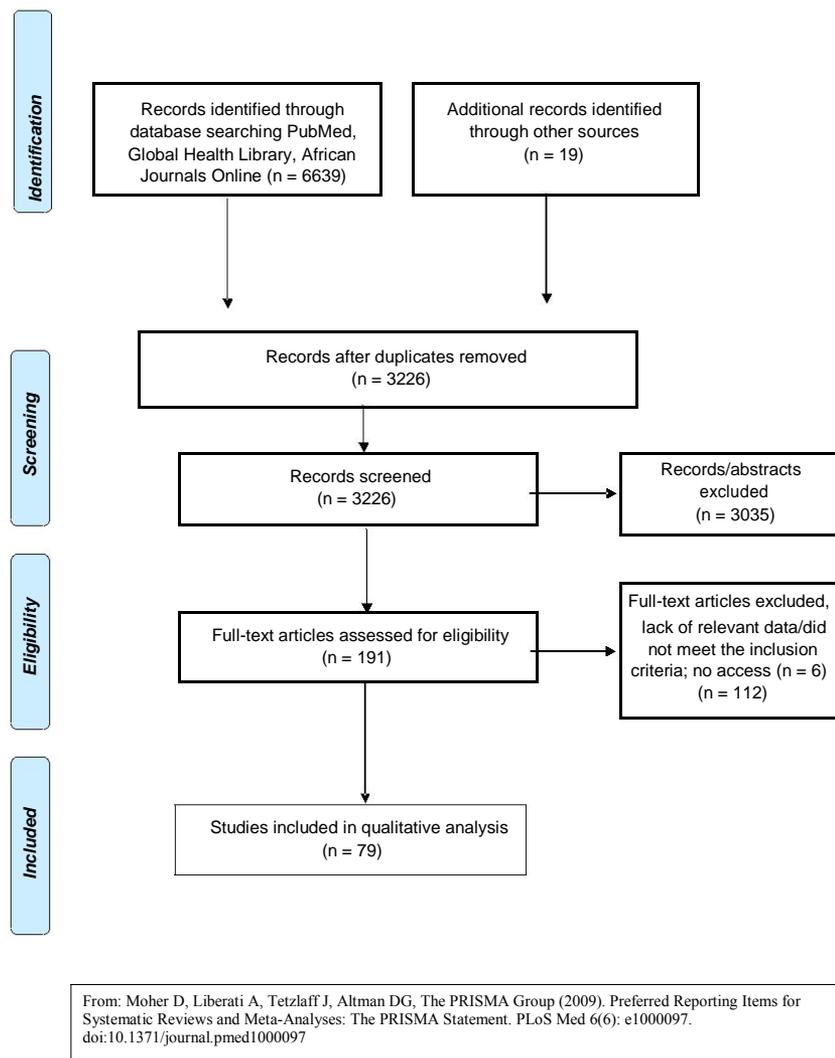


Figure 1 Flow diagram of the selection of research papers for inclusion

Secondly, the growing dominance of the alcohol market by a small number of transnational corporations [47] creates powerful negotiation capacities where economic arguments such as benefits deriving from tax revenue and employment opportunities are used to influence important policy decisions that favor alcohol consumption [48–51].

Demographics and rapid urbanization

The young population and rapid urban population growth are the main characteristics reported in the analyzed records ($n = 14$). Three main issues regarding how Africa's population demographic characteristics and rapid urbanization influence alcohol consumption were identified. First, 42% of the population is aged 15 years or

under [52,53]. Youth developmental characteristics make them particularly vulnerable to alcohol consumption due to increasing exposure to alcohol marketing and the influence of peer pressure [54]. Secondly, because the majority of women currently abstain from alcohol consumption in Africa, the alcohol industry is tailoring their marketing efforts to change cultural acceptance of alcohol consumption among females in this region [12,20,55]. Thirdly, the increase in the availability of industrialized alcoholic beverages in urban environments [56] and the lack of urban development structures and strategies increases the risk for harmful alcohol consumption [57–59].

International trade agreements

Several studies reported that global and regional trade and international investment agreements have an adverse influence in alcohol control measures in Africa, as they generally make alcohol more affordable ($n = 9$). International trade agreements and requirements imposed by bodies such as the International Monetary Fund [11] have forced the removal of bans on alcohol in some African countries and have contributed to lower production costs [60]. Trade agreements have also served as a basis for global producers to directly challenge many measures taken by African governments affecting alcohol availability and control, bypassing domestic laws and national juridical authority [61]. However, these public health concerns are not reflected at the level of international trade agreements or in important the discussions on market liberalization in the Regional Economic Communities (RECs) [6,62,63]. Trade-related implications of NCD prevention and management have not yet entered into global or regional debates and national plans to address the increased misuse of alcoholic beverages [64,65].

DISCUSSION

Our review identified seven factors that could affect alcohol consumption and alcohol-related harm in Africa in the near future. Increased availability, corporate targeting and the weak policy infrastructures are mentioned consistently in the research literature pertaining to the African context.

The increased economic growth in many African nations has provided an opportunity for international alcohol corporations to expand their alcohol market. In a continent with a young population and high levels of abstention, especially among females, the expansion of the alcohol market will also be associated with the alcohol industry attempts to recruit new drinkers through the increased use of alcohol marketing and the development of new, locally produced products [38]. These new drinkers are likely to be females and youth who come from both upper and lower economic classes [66,67].

The findings from this analysis also suggest that alcohol producers and trade associations are both making efforts to influence the policy agenda and to downplay alcohol's harms, as has occurred in developed countries [6,68]. One such case is the proposed alcohol marketing ban in South Africa. In many African countries these influences are usually propagated through social aspects organizations,

which the industry has established to shape beliefs about alcohol consumption and to improve the image of international alcohol corporations [69–72]. The industry attempts to influence public health efforts by promoting messages that downplay government authority to regulate alcohol through such mechanisms as the use of trade agreements and by linking reductions in marketing opportunities or alcohol outlet licenses to losses in employment [12,59,73]. Similar findings have been noted in other regions where rapid economic change is occurring, such as China, India and Latin America [74–76].

Because individual choices are determined in part by the influence of social environments and globalization-driven changes in culture, a new policy agenda, strong leadership and the active involvement of governments in protecting youth and the public's health in general are needed. Effective strategies to reduce alcohol consumption and related harm are well known [3,77], but the absence of public health infrastructures in many African countries and the increased power of corporate interests and their capacity to influence policy decisions creates added challenges for public health efforts to control harmful alcohol consumption in African countries. While the importance of actively involving public health advocates and public interest organizations in the policy development process has been recognized [78], in the African region this involvement remains weak. Recent efforts in alcohol policy development in Malawi have shown the importance of such involvement. Despite the influence of the alcohol industry in the policy development process, the Ministry of Health and civil society organizations played a major role in formulating alcohol policy in the public interest [57]. Similarly, integrated approaches at the primary care level and re-alignment of health services to respond to alcohol's adverse effects on health are often missing in the African context [59] and will be vital in addressing increased consumption. Effective intersectoral approaches within an effective regulatory environment that extends beyond national borders in some countries have also been found to provide a foundation for progress [64,79,80].

In the presence of the powerful factors that continue to affect alcohol consumption and alcohol-related harm, we argue that Africa urgently needs to make strategic shifts in policies in the areas of international trade agreements, economic development, public health infrastructures and the regulation of alcohol prices, marketing and availability. These strategic shifts require concerted actions, based on strong intersectoral collaboration and multi-disciplinary

action, as underlined in expert and stakeholders meetings hosted by the WHO in Africa and by the WHO's Regional Strategy to Reduce Harmful Use of Alcohol. Strong leadership at both the national and international levels is a key ingredient for changes in alcohol policies but a crucial complementary role, especially for implementation, lies with civil society, namely with regional networks, such as the Southern African Alcohol Policy Alliance [supported by the Norwegian non-governmental organization (NGO) FORUT], public health associations and academia. A broad reach is needed in response to the compelling evidence of both alcohol-related harm and the policies that have shown promise in reducing it. In the absence of more effective policy, the gathering storm of emerging risk factors is likely to lead to epidemics of alcohol-related injuries, NCDs and alcohol dependence.

This study has several limitations. First, this is not a systematic review. However, to avoid selection bias, we have used a systematic approach. Secondly, although the search strategy was designed to be comprehensive, relevant published papers from other databases or records that were not associated with the key words used in the search might have been missed, and therefore were not included in this review. Thirdly, the coding of factors within the papers can be somewhat subjective. To mitigate this, we used categories identified previously [2,19,20]. Fourthly, the identification of factors and their description depends upon the quality of the available literature, and is subject to publication biases. We attempted to overcome this limitation by requiring each finding used in this analysis to be supported by evidence. Finally, countries in Africa are diverse in their levels of alcohol consumption, as well as alcohol-attributable harm, reflecting different contexts and realities. Consequently, some factors may have greater relevance in some countries compared to others, and the situation in each country cannot necessarily be generalized.

The main strength of this review is the systematic approach that followed accountable and explicit methods to comprehensively describe factors that potentially influence the prevalence and patterns of alcohol consumption in Africa—to our knowledge, this is the first attempt to do so.

CONCLUSION

We identify several factors that may contribute to further increases in alcohol consumption in Africa. A stronger understanding of how these factors mutually reinforce each other may assist policymakers in formulating effective

policy measures to reverse the trend of increasing alcohol consumption and, at a minimum, maintain current levels of abstinence. African governments and international health agencies should take an active role in protecting the health of the public by reducing the burden associated with alcohol consumption. This can only be achieved by increased implementation of intersectoral strategies, community involvement in the policy dialogue, health services reorientation and more rigorous regulation of alcohol availability, pricing and marketing.

Declaration of interests

None.

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Study III - “Alcohol control policies in 46 African countries: Opportunities for improvement”.

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Alcohol Control Policies in 46 African Countries:
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Abstract

Aims: There is little information on the extent to which African countries are addressing alcohol consumption and alcohol-related harm, which suggests that evaluations of national alcohol policies are needed in this region. The aim of this article is to examine the strength of a mix of national alcohol control policies in African countries, as well as the relationship between alcohol policy restrictiveness scores and adult alcohol per capita consumption (APC) among drinkers at the national level.

Methods: We examined national alcohol policies of 46 African countries, as of 2012, in four regulatory categories (price, availability, marketing and drink-driving), and analyzed the restrictiveness of national alcohol policies using an adapted Alcohol Policy Index (API). To assess the validity of the policy restrictiveness scores, we conducted correlational analyses between policy restrictiveness scores and APC among drinkers in 40 countries.

Results: Countries attained a mean score of 44.1 of 100 points possible, ranging from 9.1 (Sao Tomé and Príncipe) to 75.0 (Algeria), with low scores indicating low policy restrictiveness. Policy restrictiveness scores were negatively correlated with and APC among drinkers ($r_s = -0.353$, $P = 0.005$).

Conclusions: There is great variation in the strength of alcohol control policies in countries through-out the African region. Tools for comparing the restrictiveness of alcohol policies across countries are available and are an important instrument to monitor alcohol policy developments. The negative correlation between policy restrictiveness and alcohol consumption among drinkers suggests the need for stronger alcohol policies as well as increased training and capacity building at the country level.

INTRODUCTION

Drinkers in African countries consume 13% more alcohol per capita than the average among drinkers globally (WHO, 2014a), and per unit of alcohol consumed, people living in under-resourced countries experience a greater burden of disease compared with those in higher in-come countries (Rehm et al., 2009). According to the World Health Organization (WHO), although a large proportion of the African population abstains from alcohol (58%), alcohol consumption among African adults, aged 15 and older, is projected to increase throughout the next decade (WHO, 2014a). However, alcohol is already a leading risk factor for death and disability in sub-Saharan Africa (Lim et al., 2012). The changing alcohol environment in Africa suggests the need for stronger alcohol control policies to reduce alcohol-related harm among drinkers, as well as to protect those who abstain from alcohol. Numerous alcohol control policy options have been found to reduce alcohol consumption and related health and social problems (Room et al., 2005; Anderson et al., 2009a; Babor et al., 2010). Evidence-based policy options include regulating alcohol's availability (e.g. reducing outlet density, and decreasing days and hours of sales), reducing alcohol's affordability (e.g. increasing the price through taxation), restrictions on alcohol marketing, and drink-driving counter-measures (e.g. maximum blood alcohol concentration (BAC) limits of ≤ 0.05 g/dl) (Babor, 2010).

In 2010, the WHO's *Global Strategy to Reduce Harmful Use of Alcohol*—endorsed by the World Health Assembly (WHO, 2010), and the *Regional Strategy on Reduction of the Harmful Use of Alcohol*— endorsed by the Regional Committee of the African Region (WHO Regional Office for Africa, 2010), proposed evidence-based strategies to reduce the harmful use of alcohol. There is little information available on the extent to which African countries have implemented strategies to control harmful alcohol consumption. Evaluations of the national alcohol policy environments across the region are therefore needed to monitor progress toward implementing the WHO's strategies and to identify areas where countries could strengthen their prevention policies. Despite the conceptual, methodological and political challenges when comparing alcohol policies across countries (Ritter, 2007; Paschall et al., 2009), recent studies have developed measurement scales that provide a framework for such analyses (Karlsson and Osterberg, 2001; Babor and Caetano, 2005; Brand et al., 2007; Carragher et al., 2014; Cook et al., 2014; Parry, 2014).

Researchers have reviewed the alcohol policy environment in specific African countries, such as South Africa (Parry, 2010, 2014). However, to our knowledge, no studies have comparatively assessed the restrictiveness of national alcohol policies across the African continent.

This article aims to examine the strength of a mix of national alcohol control policies, as of 2012, in African countries. Alcohol policies in four regulatory categories (price, availability, marketing and drink-driving) are evaluated. Additionally, we examine the relationship between alcohol policy restrictiveness scores and adult alcohol per capita consumption (APC) among drinkers at the national level.

METHODS

Data sources

Data on national alcohol policies in 46 African countries collected in the 2012 WHO Global Survey on Alcohol and Health (WHO, 2012) were analyzed. National alcohol policies are made up of a set of individual policies, strategies and implementing actions (WHO, 2007). Country focal points, appointed by their respective Ministries of Health, completed the surveys with a regional response rate of 100%. The survey was offered in English, French and Portuguese. We used data from the 2008/9 survey to assess changes in perceived levels of policy enforcement over time, for which comparable data were available.

National data on alcohol consumed in 2012 were obtained from two main sources: the Global Information System on Alcohol and Health (WHO, 2014b) and published surveys. The measures of consumption included both recorded and unrecorded alcohol. Details on the use of country specific alcohol consumption estimates are described in the Global Status Report on Alcohol and Health (WHO, 2014a) and elsewhere (Poznyak et al., 2013).

Alcohol Policy Index

To evaluate the restrictiveness of alcohol policies, we adapted the Alcohol Policy Index (API) from Brand et al. (2007). We used an updated source to identify the levels of evidence for effectiveness for each of the alcohol control policies (Babor et al., 2010) assigning one, two or three 'plus-signs' (i.e. '+', '++', '+++') to indicate evidence for limited, moderate and high effectiveness in the scientific literature (Table 1).

In addition, we developed a comprehensive weighted scoring system, consistent with Brand et al.'s methodology, with differences as noted. We ranked countries based on the calculated total restrictiveness score, where higher scores indicate increasing restrictiveness. We used the effectiveness ratings to assign weights of 1, 2 or 3 to each of the alcohol control policies included in the API (e.g. policies given one plus-sign received a weight of 1 and policies with three plus-signs received a weight of 3). We created a scale that ranged from 0–100 points, using points proportionate to

the assigned weights across the alcohol control policies. Due to available data, we included four regulatory categories (rather than the five categories used by Brand et al., omitting the ‘drinking context’). The control policies within each of the categories also differed.

To design a scale that reached a score of 100, our scoring system with ten control policies was as follows: (4.546 points*2 policies with limited effectiveness) + (9.091 points*4 policies with moderate effectiveness) + (13.637*4 policies with high effectiveness) = 100 points. We included 10 main control policies in the API. Six of the 10 were comprised of several sub-policies (rather than a single policy) due to policy distinctions by alcoholic beverage type, on- and off-premise restrictions, or marketing media types.

Correlation between alcohol policy restrictiveness scores and alcohol consumption

To validate the total alcohol policy restrictiveness score, we assessed the correlation between the API variables and the APC among drinkers. For alcohol consumption, the average consumption among drinkers in Africa in 2012 was 16 l of pure alcohol. Levels of consumption vary widely, ranging from 1.94 l in the Comoros to 34.3 l in Chad. We found significant negative correlation between the alcohol policy restrictiveness score and APC among drinkers ($r_s = -0.353$; $P = 0.005$), as well with weighted score ($r_s = -0.332$; $P = 0.005$) and rank ($r_s = -0.357$; $P = 0.005$), indicating that as country’s total restrictiveness score or ranking increases, the APC among drinkers decreases.

When sub-policy data were available, we calculated an average of the sub-policy scores and used the average as the policy-level score in the regulatory category calculations. We assigned countries points proportionate to the restrictiveness of the written policies. We determined the percentage of partial points awarded for intermediate levels of restriction according to the number of restrictiveness categories. For example, the maximum points possible for having alcohol excise taxes was 13.6 points, which we awarded to countries with excise taxes on beer, wine and spirits. Countries that had excise taxes on only one or two beverage types earned 50% of the points, or 6.8 points, and countries without any alcohol excise taxes earned zero points. For policies with four options, points were allocated in four ways. For example, regarding BAC limits, countries were given 100% of the points for BAC limits of 0.00– 0.02 g/dl, 67% for 0.03–0.05, 33% for >0.05, and no points if they had no written BAC policy. We calculated the regulatory category score by summing the points awarded for policies within the category. We derived a weighted mean score by

summing the multiplication of each regulatory category score by the percentage of the maximum points possible in that regulatory category. The formula to calculate the weighted mean score was as follows: Weighted mean score = price scores*18.2% + physical availability scores*40.9% + marketing scores*4.5% + drink-driving scores*36.4%. The total policy restrictiveness score is the sum of the regulatory category points.

For the API, data were obtained for 1000 of the 1012 policies (22 sub-policies*46 countries) based on the country level information collected in 2012. Less than 1.0% of the data were missing, including one country (Mauritania) that reported a total ban on alcohol instead of responding directly to the survey questions. Consistent with the WHO methodology (WHO, 2014a), we did not make the assumption that a total ban on alcohol suggests the greatest level of restriction across all regulatory categories, nor that it obviates the need for specific policies. We did not assign scores to countries with missing data on any of the policies and eliminated them from the ranking ($n = 6$). Forty of 46 African Member States (87.0%) were included in the final ranking.

Data analysis

Descriptive analyses were conducted using SPSS (version 20.0). We examined countries’ regulatory categories, selected based on evidence of effectiveness for reducing alcohol-related harms (Babor et al., 2010). We included data on perceived enforcement of existing policies collected in the 2008/2009 and 2012 WHO surveys (WHO, 2012, 2014a, b). The perceived level of enforcement of existing policies was evaluated using a scale from 0 to 10, in which 10 indicated optimal enforcement in both 2008/09 and 2012 surveys.

We tested all variables for normality using Shapiro–Wilk test and found that price ($W = 0.565$, $df = 40$, $P = 0.000$), marketing ($W = 0.714$, $df = 40$, $P = 0.000$) and drink-driving ($W = 0.925$, $df = 40$, $P = 0.011$) were not normally distributed. Therefore, we used the non-parametric Spearman correlation coefficient to test the validity of the API, and calculated the correlation between API and APC among drinkers. Due to very high levels of alcohol abstention in Africa, and variables (like cultural factors) that can affect consumption, the measure of consumption among drinkers, as opposed to the whole population is the most appropriate to use.

Table 1. Evaluation methods for the Alcohol Policy Index

Regulatory category	Level of evidence for effectiveness <i>Evaluation categories</i>		
	Limited	Moderate	High
Price	Additional levy on specific products <i>No, Yes</i>		Excise tax None, 1–2 beverage types only, all beverages ^a
Physical availability		Government monopoly on retail sales <i>None, 1–2 beverage types only, all beverages^a</i>	Minimum legal purchase age <i>Average between on- and off-premise restrictions (None, <18, 18, >18)</i>
		Restrictions on hours and/or days of sales <i>Average between on- and off-premise restrictions (None, Hours or days, Hours and days)</i>	
		Restrictions on outlet density <i>Average between on- and off-premise restrictions (No, Yes)</i>	
Marketing	Restrictions on marketing exposure <i>Overall average level of restriction (None, Voluntary/Self-regulation, Partial, Total Ban) across medias (National television, National radio, Print media and Billboards)</i>		
Drink-driving countermeasures		Sobriety checkpoints <i>No, Yes</i>	Lowered BAC <i>No policy, >0.05, 0.05–0.03, 0.00–0.02</i> Random breath testing <i>No, Yes</i>

Source: Babor T, Caetano R, Casswell S et al. (2010) *Alcohol: No Ordinary Commodity*. New York: Oxford University Press.

^aAll beverages included in the survey: Beer, wine, spirits

RESULTS

National alcohol policies

African countries have implemented various alcohol control policies in the regulatory categories of price, physical availability, alcohol marketing and drink-driving (Table 2).

Price

Eighty-four percent of the countries had alcohol excise taxes, although fewer adjusted the tax rates for inflation, ranging from 19% of countries that inflation-adjusted taxes on spirits to 26% that inflation-adjusted taxes on beer (Table 2).

Physical availability

The majority of countries had a licensing system for the production and retail sales of alcoholic beverages, varying

by beverage type (Table 2). Countries more commonly had on-premise sales restrictions (e.g. bars, restaurants) than off-premise restrictions (e.g. liquor stores). The perceived average level of enforcement among all reporting countries in 2012 was 4.8 for on-premise sales restrictions, and 4.5 for off-premise sales. However, the perceived level of enforcement of on-premise increased by 0.9 points from the 2008/09 survey and the off-premise sales restrictions increased by 1.2 points. The minimum legal purchase age (MLPA) limit ranged from age 15 years for off-premise sales to age 21 years for on- and off-premise sales. Nine (19%) countries did not have a MLPA policy for on-premise sales and 12 (26%) did not have such policy for off-premise sales (excluding Mauritania that has a total ban on alcohol).

Table 2. National alcohol control policies in 46 African countries

Domain	Alcohol policies	Number of countries (%)
Pricing	1. Alcoholic beverages, adjusted for inflation	Beer/wine/spirits 12 (26%)/10 (21%)/9 (19%)
Taxation	2. Excise tax	Beer/wine/spirits 43 (93%)/41 (89%)/39 (84%)
Physical availability	3. Licensing	Beer/wine/spirits
	a. Production	38 (82%)/30 (65%)/29 (63%)
	b. Licensing for retail sales	41 (89%)/39 (84%)/40 (86%)
	4. Restrictions	Hours/density/location
	c. On-premise Sales	24 (52%)/12 (26%)/26 (56%)
	d. Off-premise Sales	17 (36%)/10 (21%)/21 (45%)
	5. Minimum legal purchase age	None/16–18 years/21 years/total ban
	e. On- premise sales	9 (19%)/33 (71%)/3(6%)/1 (2%)
	f. Off- premise sales	12 (26%)/31 (67%)/2(4%)/1 (2%)
		Statutory ban or restrictions/voluntary agreement or self-regulation/no restriction
Marketing	6. Restricting consumption in public venues	
	g. Health care establishments	33 (71%)/8 (17%)/5 (10%)
	h. Educational buildings	32 (69%)/8 (17%)/6 (13%)
	i. Government offices	33 (71%)/6 (13%)/7 (15%)
	j. Sports events	19 (41%)/7 (15%)/20 (43%)
	k. Leisure events	7 (15%)/10 (21%)/29 (63%)
	7. Legally binding regulations	
	a. Alcohol advertising	14 (30%)
	b. Product placement	10 (21%)
	c. Alcohol sponsorship	7 (15%)
d. Sales promotion	6 (13%)	
Drink-driving	8. BAC Limits (in g/dl)	None/0.00–0.02/0.05/>0.05
	a. General population	7 (15%)/6 (13%)/9 (19%)/21 (45%)
	9. Sobriety checkpoints	15 (32%)
	10. Random breath testing	24 (52%)

Source: WHO (2012) Global Survey on Alcohol and Health. Geneva: World Health Organization.

Alcohol marketing

The majority of countries (70%) had no legally binding regulations for alcohol marketing (Table 2). Only 15% of the countries had restrictions on alcohol sponsorship and 13% had retail sales promotion restrictions. In 2012, the perceived average level of enforcement for existing advertising restrictions was 6.4, up from 4.9 in 2008/09.

Drink-driving countermeasures

Forty-five percent of the countries had a legal BAC limit for drivers in the general population above 0.05 g/dl and 15% did not have a policy based on BAC limits (Table 2). In 2012, the perceived average level of enforcement of drink-driving countermeasures was 4.3, a slight in-crease

from 4.0 in 2008/09. Fifty-two percent of the countries used random breath testing and nearly one-third had sobriety checkpoints.

Policy restrictiveness scores

Table 3 shows the estimated alcohol policy restrictiveness scores from the API by country and regulatory category. As shown in the last column, the countries that have implemented a more restrictive mix of alcohol control policies include Algeria Equatorial Guinea, Lesotho, Liberia, Madagascar and Zambia, while Sao Tomé, Serra Leone, Togo, Gambia, Gabon and Ethiopia appear to have the least restrictive mix of policies.

Table 3. Estimated alcohol policy restrictiveness scores by country and regulatory category

Countries	Price ^a (max 18.2)	Physical Availability ^b (max 40.9)	Marketing ^c (max 4.5)	Drink-driving countermeasures ^d (max 36.4)	Total restrictiveness score ^e	Weighted mean score ^f	Rank ^g
Algeria	13.6	29.5	4.5	27.3	75.0	24.7	40
Angola	13.6	9.1	1.1	18.2	42.0	12.9	19
Benin	13.6	2.3	0.0	22.7	38.6	11.7	16
Botswana	13.6	18.2	0.4	18.2	50.4	16.6	27
Burkina Faso	13.6	0.0	0.0	NA	NA	NA	NA
Burundi	13.6	6.8	0.0	NA	NA	NA	NA
Cameroon	13.6	15.9	2.3	18.2	50.0	15.7	24
Cape Verde	13.6	13.6	1.9	4.5	33.7	9.8	9
Central African Republic	13.6	22.7	0.0	4.5	40.9	13.4	18
Chad	6.8	13.6	0.4	9.1	29.9	10.1	7
Comoros	13.6	18.2	0.0	27.3	59.1	19.8	32
Congo	13.6	25.0	0.0	0.0	38.6	12.7	17
Cote d'Ivoire	6.8	22.7	0.0	4.5	34.1	12.2	10
Democratic Republic of Congo	13.6	9.1	2.3	13.6	38.6	11.3	15
Equatorial Guinea	13.6	27.3	0.0	27.3	68.2	23.6	39
Eritrea	13.6	13.6	0.0	22.7	50.0	16.3	25
Ethiopia	13.6	13.6	0.4	4.5	32.2	9.7	8
Gabon	13.6	6.8	0.0	4.5	25.0	6.9	6
Gambia	13.6	9.1	2.3	0.0	25.0	6.3	5
Ghana	13.6	9.1	1.1	18.2	42.0	12.9	20
Guinea	13.6	9.1	0.0	13.6	36.4	11.2	12
Guinea-Bissau	13.6	0.0	0.0	NA	NA	NA	NA
Kenya	13.6	29.5	NA	0.0	NA	NA	NA
Lesotho	13.6	25.0	0.0	27.3	65.9	22.6	38
Liberia	13.6	18.2	0.0	31.8	63.6	21.5	36
Madagascar	13.6	27.3	4.5	18.2	63.6	20.5	37
Malawi	18.2	9.1	0.0	27.3	54.5	17.0	30
Mali	0.0	0.0	0.0	22.7	22.7	8.3	4
Mauritania	Total ban	Total ban	Total ban	Total ban	Total ban	Total ban	Total ban
Mauritius	13.6	22.7	4.5	9.1	50.0	15.3	26
Mozambique	18.2	18.2	0.0	18.2	54.5	17.4	29
Namibia	13.6	18.2	0.0	27.3	59.1	19.8	33
Niger	13.6	18.2	4.5	0.0	36.4	10.1	13
Nigeria	13.6	9.1	3.0	9.1	34.8	9.6	11
Rwanda	13.6	18.2	0.8	18.2	50.8	16.6	28
Sao Tome and Principe	0.0	0.0	0.0	9.1	9.1	3.3	1
Senegal	6.8	22.7	4.5	13.6	47.7	15.7	23
Seychelles	13.6	9.1	NA	18.2	NA	NA	NA
Sierra Leone	13.6	0.0	3.4	0.0	17.0	2.6	2
South Africa	13.6	13.6	1.5	9.1	37.9	11.4	14
Swaziland	6.8	27.3	0.0	22.7	56.8	20.7	31
Togo	13.6	4.5	0.0	0.0	18.2	4.3	3
Uganda	13.6	11.4	0.0	18.2	43.2	13.7	21
United Republic of Tanzania	13.6	15.9	0.0	18.2	47.7	15.6	22
Zambia	13.6	20.5	0.0	27.3	61.4	20.8	35
Zimbabwe	13.6	22.7	4.5	18.2	59.1	18.6	34
<i>Mean policy score</i>	<i>12.6</i>	<i>14.6</i>	<i>1.1</i>	<i>14.8</i>	<i>44.1</i>	<i>13.7</i>	

Data are missing on one or more of the policies.

NA, not available.

a Price includes policies on additional levy's on specific products and alcohol excise taxes.

b Physical availability includes government monopoly on retail sales, restrictions on hours/days of sales, restrictions on outlet density and minimum legal purchase age.

c Marketing includes national policies to restrict exposure on TV, radio, print and billboards

d Drink-driving countermeasures include sobriety checkpoints, lowered BAC and random breath testing.

e The total restrictiveness score is the sum of the regulatory category points. Low impact scores indicate countries with the least restrictive policies and high scores indicate countries with the most restrictive policies.

f Weighted mean score is calculated by summing the multiplication of each regulatory category score by the percentage of the maximum points possible in each regulatory category (e.g. price scores were multiplied by 18.2%, physical availability scores were multiplied by 40.9%).

g Country rank position based on total restrictiveness score (n = 40). Low scores indicate countries with the least restrictive alcohol policies and high scores indicate countries with the most restrictive alcohol policies.

The bottom row of the table provides the mean policy scores across countries for each regulatory category. Of 100 points possible, the mean total restrictiveness score was 44.1, ranging from 9.1 in São Tomé and Príncipe to 75.0 in Algeria. The apparent restrictiveness of control policies varied across regulatory categories (Table 3). Countries had a mean score of 12.6 out of a possible 18.2 points for pricing policies, representing 69% of the possible points. Of the 40.9 points possible for policies related to physical availability, countries earned 14.6 points (i.e. 36% of the points possible). Countries earned 14.8 of 36.4 points for drink-driving policies (i.e. 41% of the points possible) and 1.1 of 4.5 points (i.e. 24% of the points possible) for alcohol marketing restrictions.

DISCUSSION

Our findings demonstrate that alcohol control policies have been implemented, to some degree, in all countries. However there is substantial room for improvement across the majority of the continent. For instance, most countries have alcohol excise taxes, yet the effectiveness of these taxes may erode over time, as they are typically not adjusted for inflation. Failure to adjust for inflation means that alcohol becomes cheaper relative to disposable income, which could lead to increased alcohol consumption and related problems (Parry et al., 2003; Elder et al., 2010). With expected economic development in the region and the increasing amount of disposable income, alcohol will continue to become more affordable and therefore people's ability to buy alcohol will also increase (Babor et al., 2010). Additionally, with increases in industrially-manufactured alcoholic beverages (Babor et al., 2015; Jernigan and Babor, 2015), our results also suggest that countries are missing an important source of government revenue.

Approaches to reduce the availability of alcohol, such as licensing systems have also been implemented. However, despite evidence for the effectiveness of other availability policies (Anderson et al., 2009a; Babor et al., 2010), such as restrictions of outlet density, sales prohibitions at specific events, and regulations on the days and hours of sales, these measures have not yet been implemented in the majority of African countries.

In the regulatory category of alcohol marketing, we found substantial variations in the restrictiveness of policies across countries. This may reflect the political unpopularity of such measures, as well as strong lobbying from the global alcohol industry, as has been noted in previous policy studies (Crombie et al., 2007; Gordon and Anderson, 2011; Cook et al., 2014; Ferreira-Borges et al., 2014). A growing body of evidence suggests that alcohol marketing restrictions can effectively reduce harmful consumption among adults and youth (Nelson et al., 2013), and may be

most important in high-abstinence populations (Obot, 2013). With the weak or non-existent controls on alcohol marketing in many countries, youth are at increased risk of being exposed to alcohol marketing, which has been associated with increased consumption (Anderson et al., 2009b). Given this situation and the existing difficulties of policy enforcement where such controls exist, the most appropriate alcohol advertising policy to implement in African countries may be a total ban on alcohol advertising, promotion and sponsorship, as is being proposed for South Africa (Jernigan, 2013).

Evidence indicates that establishing a low maximum legal BAC limit and strong, consistent enforcement can reduce traffic injuries and fatalities (Shults et al., 2001). However, our study shows that ~60% of the countries either had a legal BAC limit above 0.05 g/dl or did not have any established BAC limit for driving. Establishing or lowering a national legal BAC limit for drivers is an important policy measure, given the large proportion of the alcohol-related burden of disease for Africa caused by unintentional injuries, including road traffic crashes (Roerecke et al., 2008). Currently South Africa is considering a 0.00 g/dl BAC limit for all drivers (Department of Transport, South Africa, 2015).

Our methods to assess the strength of policies using the API show that it is possible to measure a mix of alcohol control policies in developing countries, adding to the growing body of literature evaluating alcohol control policies worldwide (Karlsson and Osterberg, 2001; Babor and Caetano, 2005; Brand et al., 2007; Cook et al., 2014). Our findings on the correlation between alcohol control policies and APC among drinkers is consistent with existing evidence suggesting that restrictive alcohol control policies may yield reductions in alcohol consumption (Babor et al., 2010). The negative correlation between policy restrictiveness and APC among drinkers, suggests that a stronger policy mix could potentially reduce the APC among drinkers and supports the usefulness of our API methodology.

Our study has several limitations. Data on alcohol policies were collected via reports from country focal points, so it is possible that data collected do not capture all existing alcohol-related policies and regulations. However, efforts have been made to cross-check data with published reports and through a process of approvals from countries to verify the accuracy of the data. Furthermore, data on the implementation and enforcement were collected, but there may be discrepancies due to variations across different parts of the country or a lack of standardization in the way individual respondents are likely to report on the extent to which policies are implemented or enforced. For this

reason, and because measuring enforcement presents a challenge due to the difficulty in securing objective data, we have only used this measure in our descriptive analysis to portray changes in perceived level of enforcement occurring in alcohol policies from 2008 to 2012 (dates of the surveys). This type of analysis has been used before in one attempt to assess alcohol policy development and implementation in Africa (Parry, 2014) but more research is needed on instruments to more accurately measure levels of implementation and enforcement of alcohol policies. Perceived level of enforcement has therefore not been incorporated into our API instrument.

In addition, the cross-sectional nature of our measures does not allow us to assess causality; we cannot be certain that restrictive policies lead to reduced alcohol consumption. Furthermore, our study leaves open the possibility that some of the observed co-variation could be the result of low consumption countries being more prone to adopt restrictive policies because of religious or cultural reasons. We also did not assess the sensitivity of our API instrument. Finally, ~30% of the alcohol consumed in Africa is unrecorded (WHO, 2014a), so our estimates of the correlation between the strength of alcohol policies and consumption are limited by the challenges of measuring alcohol use in each country. Improved methods for estimating unrecorded alcohol are needed.

Nevertheless, our findings have important public health implications, as they provide a way to compare the strength of national alcohol control policies across a large sample of countries in a developing region. This is the first study evaluating a mix of written alcohol policies and their apparent association with alcohol consumption in Africa. Moreover, the study constitutes a much needed first step to monitor alcohol control policy developments in a region where the alcohol environment is rapidly changing. Future research should assess how the enforcement of alcohol control policies influences population level alcohol consumption, and whether the strength of alcohol policies is increasing or decreasing over time. Our study has focused on analyzing alcohol policy measures in countries, as reported by country focal points.

Although in our article, we did not discuss the concept of ‘alcohol policy’, future studies should explore the value of policy approaches currently being used in African countries. Parry (2005) put forth this question and the possible added value of having an explicit and articulated national policy (or strategy), constituted by an organized set of values, principles, and objectives that establishes concrete actions and targets to be attained. Having explicit national alcohol policy in African countries would help make necessary resources more available and reduce the

barriers encountered through the implementation of ad hoc or fragmented policy measures across different departments and

CONCLUSION

The API used in this study is a useful tool for international comparisons and can be used to monitor alcohol policy developments in various regulatory categories. Given the correlation between restrictive alcohol policies and reduced consumption, our study demonstrates the need for stronger alcohol control policies in the African region. Government leaders and decision makers at the country level would benefit from increased training and capacity building that focuses on effective development and implementation of alcohol control policies to prevent increases in alcohol consumption and related adverse consequences.

AUTHOR CONTRIBUTIONS

C.F.-B., M.B.E., C.D.H.P., S.D. and T.B. contributed to the writing, revision and finalization of the draft. C.F.-B. conceptualized the under-lying research and coordinated regional data collection. C.F.-B., M.B.E. and C.D.H.P. were responsible for analyzing data. M.B.E. was responsible for adapting the API methods for use in this study.

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CONFLICT OF INTEREST STATEMENT

None declared.

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Study IV - Alcohol policy process in Malawi: making it happen.

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Alcohol policy process in Malawi: Making it happen

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Keywords: Alcohol policy, alcohol policy process, policy analysis, policy formulation

Abstract

Aims: This paper presents the recent history of alcohol-policy development in Malawi, describing changes in the policy process, initiatives to expand the involvement of relevant stakeholders, and efforts to limit the role and influence of vested commercial interests. We also note the challenges that remain for alcohol-policy formulation in Malawi.

Design: We used a holistic, single case-study design to illustrate the process, using information generated from a combination of direct and indirect observations, document reviews, media analysis, and in-depth and semi-structured interviews.

Findings: Alcohol policy development in Malawi reflects a complex combination of political and social processes, fraught with numerous stakeholder conflicts and political power plays. Despite the influence of the alcohol industry in the agenda-setting and consultative process, when adequately resourced and supported, civil society organizations can play an important and productive role in steering policy developments in a sound public-interest direction.

Conclusions: Documenting this type of practical “natural experiment” provides an important opportunity for learning. The Malawi case study reinforces the need for more regular policy analysis of similar initiatives—in particular, in low-income developing countries—and for additional study of the alcohol-policy development process and policy implementation.

A policy results from a complex interaction of political and social processes. Recent experience in the African region suggests that alcohol policy formulation is no longer the exclusive domain of governmental authority, but rather involves the participation of others who contribute to—and influence—the end result (Bakke & Endal, 2010; Parry, 2010; Pitso & Obot, 2011). Because many of those stakeholders represent vested corporate interests, those who promote health and social concerns are well-advised to increase their understanding of the policy-development process, the actors involved, and the political implications of their actions.

In the case of alcohol policies, health ministries play a crucial role in bringing together the governmental agencies and relevant interest groups needed for effective policy design and implementation. This brings to the table different government sectors such as social welfare, transport, agriculture, policing and law enforcement, trade, industry, commerce, and finance, as well as non-governmental organizations advancing social, health, economic justice, and faith issues, and economic operators that promote the business interests of alcohol producers, distributors, and retailers, and their allies in the advertising and media industries. In this scenario, alcohol policies have become a "product of competing interests, values and ideologies." (Parry, 2010)

As in many other areas of political activity, promoting the public good requires conscious and coherent organization and planning. Important elements in policy development include alignment of key interest groups, capacity building, increasing public awareness of alcohol problems and potential interventions, repeated consultation and negotiation with government officials, civil society and other stakeholders, and creating new mechanisms for a broad collaborative process that will facilitate decision making and strengthen policy implementation (Driessen, Glasbergen, & Verdaas, 2001). The process also requires a thorough understanding of the roles and interests at stake and a willingness to adhere to strong principles that will ensure that potentially effective alcohol policies are protected from distortion by commercial or vested interests. (Casswell, 2009; Daube, 2010; Jahiel & Babor, 2007; Moodie et al., 2011). As the policy-making process becomes more complex and more contentious, health activists must focus increasing attention on the politics of alcohol to complement their knowledge of the fixed rules of governance and their understanding of evidence-based approaches to reducing problems related to alcohol consumption.

In this article we describe the organization and evolution of an interactive and participatory alcohol policy process within such a complex set of dynamics. Malawi began

developing an alcohol policy in 2007. Situated in southeast Africa, Malawi is bordered by Mozambique to the south, Zambia to the west, and Tanzania to the east. Eighty-five percent of the population lives in rural areas, and the country's economy depends largely on agriculture, including significant tobacco production, which accounts for about 55% of the country's exports. According to a 2009 WHO STEPS survey, 12.6% of the adult population aged 25–64 drink alcohol. Of those, 30.3% of the men and 4.1% of the women are current drinkers (World Health Organization (WHO), 2009). Drinkers consume, on average, about 15.5 litres of pure alcohol per year; 30.6% of male and 14% of female drinkers engage in heavy episodic drinking (WHO, 2011).

Method

Research Approach

The most common approach to the study of public-policy creation disaggregates the process into a number of functional components (Lasswell, 1977). In our case we utilized a conceptual model of the policy cycle that helped us to unravel the political process and better understand the context of policy formulation in Malawi (Young & Quinn, 2002). For the purposes of the study we divided the policy process into two categories: (1) problem definition and agenda setting and (2) policy formulation.

Study objectives

The study aimed to (1) document the different stages and actors involved in the policy process and (2) gain an improved understanding of how a national alcohol policy could be developed using a participatory process.

Methodology

Information for the study derived from a qualitative data collection approach. We used a holistic, single case study design to document alcohol policy development in Malawi (Yin, 2009).

Data collection process

The research project assigned an in-country consultant to collect information related to the policy process. Data collection was guided by a clear protocol and procedures that provided a format for narrative reporting. Those procedures,

based on the WHO's *Guide for Documenting and Sharing "Best Practices" in Health Programs* (WHO, 2008), governed the systematic collection of numerous sources of evidence describing the policy process. Data collection lasted from August to October 2011 and drew from multiple sources, including 1) a review of (a) official documents, such as reports and minutes of taskforce meetings and regional consultations, (b) notes and support documents from FORUT, and (c) newspaper articles in *The Nation, Malawi News, The Daily Times, and Sunday Times*; 2) direct observation of Taskforce and regional meetings; 3) key informants' observations on the outcomes of the meetings; and 4) in-depth interviews with representatives of Drug Fight Malawi, the secretariat for the Taskforce. The project also conducted semi-structured interviews with key persons involved in the policy-development process, including officials at the Ministry of Health. Those interviews explored the different stages of the policy-development process and tracked participants' experiences. Table 1 provides a chronological overview of the first stages of the policy cycle. Interview results were reviewed with study participants for accuracy. The collection of multiple sources of data helped substantiate the accuracy of the information and improved the consistency of the findings.

Results

Defining the problem and setting the agenda

In 2007, as they had done in other countries throughout the African Region (Bakke & Endal, 2010), representatives of the alcohol industry supported the government of Malawi in its development of a draft National Alcohol Policy. That industry approach was soon challenged by civil society organizations, which viewed it as overly supportive of industry business and policy initiatives and insufficiently attentive to public health and safety concerns. In April 2008, Drug Fight Malawi, a local non-governmental organization (NGO) active in the prevention of alcohol consumption among youth, spearheaded an effort to reconsider the draft policy, convening a stakeholders' meeting to evaluate partners' interest and willingness in re-orienting the policy process in a more participatory and public-health-centered direction. This NGO initiative introduced a new dynamic to the policy-setting process, bringing together representatives from numerous government ministries and civil society organizations and incorporating the views of the broader community. The new process also excluded those groups and companies whose interests were at odds with evidence-based alcohol policy.

The gathering recommended a new agenda for establishing

a national alcohol policy in Malawi and stressed the need both to appoint a new lead ministry to lead policy development and to create basic institutional mechanisms to support the national alcohol policy. Recommendations also included broadening civil society representation in the process by involving NGO networks whose constituents are affected by alcohol consumption.

The new agenda received technical support from several international partners, among them the Global Alcohol Policy Alliance (GAPA), FORUT (Campaign for Development and Solidarity), and the WHO Regional Office for Africa. FORUT, as a development NGO specializing in alcohol prevention, connected key persons in Malawi to international networks that offered additional expertise and guaranteed sustainable funding for the policy process.

Policy formulation

Setting up policy development structures and establishing a lead agency

As a first step, Drug Fight Malawi consulted with participating organizations to determine the structure of the committee that would steer the policy-development process and agree on its specific mandate. This structure, called National Alcohol Taskforce Committee, was initially led by the Ministry of Home Affairs and National Defense. Its members included government ministries, such as Education, Trade, Youth, Health, Gender, and Local Government, as well as agencies such as the Police, Revenue Authority, Road Traffic, and National AIDS Commission. Civil society networks such as Human Rights Consultative Committee (HRCC), Malawi Health Equity Network (MEHN), Malawi Economic Justice Network (MEJN), Malawi Network AIDS Organizations (MANASO), Gender Network NGOs, and the National Association for People living with HIV & AIDS in Malawi (NAPHAM) also participated. Membership was based on participants' adherence to a clear public-health vision based on evidence-based, effective strategies relevant to the reduction of alcohol-related harm.

Later in the process, in January 2011, the Taskforce Committee decided to appoint the Ministry of Health as the permanent lead government agency to direct the further development of the alcohol policy. Responsibility for coordinating the process shifted to the NCDs programme, a division of the Directorate of Clinical Services. With those changes, the Taskforce Committee became an interim technical committee for informing policy decisions under the authority of the Ministry of Health. This Ministry thus assumed the responsibility for making policy decisions and

communicating with stakeholders, leaving the Secretariat, Drug Fight Malawi, responsible for the policy consultant and for the emerging costs of meetings and further studies.

Building capacity and gathering data to inform policy making

During 2009 and 2010 the Secretariat organized several capacity-building activities to strengthen the motivation and ability of Taskforce members to participate effectively in the creation of a national alcohol policy. Those activities focused on developing knowledge and skills related to advocacy of an evidence-based alcohol policy. Members of the committee participated in an international training workshop on that subject and in a “Trainer of Trainers” program on alcohol policy conducted by FORUT and Blue Cross Norway.

The committee also conducted a baseline population survey in 2010, in part to examine the role of unrecorded alcohol consumption in the country, about which there was little reliable data. The results, which indicated that unrecorded alcohol was responsible for serious socio-economic challenges and violence, were used to inform the developing policy document (Drug Fight Malawi, 2010).

Consulting and developing policy documents: from policy papers to draft policy

Different types of consultations occurred during this process. Monthly task force meetings kept members up to date about progress on the policy and allowed for significant discussion of issues related to document development, follow-up tasks, strategic planning, and the collection of endorsements for the policy papers being developed. Another form of consultation involved district-wide meetings, with both community and government representation.

The consultative process began in April 2008 using a questionnaire, administered to key government, civil society and alcohol-industry representatives through e-mail and face-to-face interviews, that aimed to assess Malawi’s alcohol situation and related needs. Key findings were later merged into a “Discussion paper,” finalized in April 2008. Following a series of consultative meetings, that paper became the “Working paper” for the policy development process.

Based on the first round of consultations, in March 2009 the Taskforce circulated a “Strategy paper” that detailed strategy orientations, themes and delivery mechanisms for the planned alcohol policy. After comment, revision, and

approval by the Taskforce Committee, a “Working Document” for use in district-wide public consultations became available in July 2009. In October 2009, the Inter-Ministerial Committee on Drugs Control reviewed and endorsed the Working Document, recommending that it constitute the first draft of the National Alcohol Policy.

The district-wide consultations that led to the second draft took place from October 2009 to April 2011 and involved activities in eight districts. The consultations were led by the Taskforce Committee and included traditional chiefs, Members of Parliament, district government officers, civil society organizations, youth and women’s groups, political and religious leaders, and the media. In June 2011, the Taskforce Committee convened the National Stakeholders’ Validation Meeting, calling for reviews of the second draft from a broader audience, including those stakeholders with an economic interest in alcohol production and sales. This meeting resulted in a third draft of the alcohol policy that, pursuant to Government policy guidance, was validated in July 2011 by the Inter-Ministerial Committee on Drugs Control.

In August 2011, the alcohol industry re-entered the policy-development process. In a letter submitted with comments to the draft policy, the industry complained that “producers and retailers, key partners in an effective policy,” had been excluded from the consultation process (Chibuku Products Limited & Carlsberg Malawi Limited, 2011a). Industry’s strong protest led to plans for two more consultation meetings, to be held in September 2011. One would assemble members of the National Alcohol Policy Taskforce Committee, and the second would bring the Taskforce Committee and representatives of the alcohol industry together.

The Taskforce review meeting produced two important results. It led to the commissioning of a three-month Alcohol Impact Baseline Survey (AIBS) to collect more data to help broaden the scope of the alcohol-policy problem statement. Additionally, the Taskforce established an ad hoc internal committee to consider, whenever possible and without compromising public health and socio-economic objectives, the integration of industry’s contributions into the national policy.

Table 1*Chronology of events during the policy process in Malawi*

Policy Stages	Date	Event
Problem Definition and Agenda Setting	2007	Presented in a stakeholders' forum, the first draft of the National Alcohol Policy for Malawi produced by the alcohol industry was subject to criticism by civil society organizations.
	2008	<p>Drug Fight Malawi, a local non-governmental organization (NGO), convened a stakeholders' meeting to secure a more participatory process. Different government ministries and civil society partners participated. The meeting sought to incorporate broader views from the community while ensuring that the alcohol industry was not involved in drafting the alcohol policy.</p> <p>The outcomes of the meeting created a new agenda, which a) protected the development of a new National Alcohol Policy from interference by vested interests; b) appointed the Ministry of Home Affairs and National Defence as the interim lead Ministry; and c) established basic institutional mechanisms to support policy development, including the designation of the NGO, Drug Fight Malawi, as (Policy) Secretariat to provide full-time operational services for the policy development</p> <p>The process received pledges of support from external partners, such as the Global Alcohol Policy Alliance (GAPA), FORUT (Campaign for Development and Solidarity), and the WHO country and Regional Office for Africa to ensure an evidence-based, participatory national alcohol policy for Malawi.</p>
Policy Formulation	2008	Policy development structures, including a full-time secretariat and a National Alcohol Taskforce Committee, were established
	2008–2010	Capacity-building and research initiatives were launched, including an international training workshop on evidence-based alcohol policies, Trainer of Trainers program on alcohol policy, constituent involvement in international scientific events, and the implementation of a baseline survey on unrecorded consumption
	2008–2013	<p>The consultative process during policy development involved the creation of numerous informational and background documents that guided discussions and fostered transparency. The following list identifies and summarily describes the most important of those documents.</p> <p>“Discussion paper,” a document used for first consultations with key stakeholders that assessed the situation and needs regarding alcohol consumption in the country (2008).</p> <p>“Working paper,” resulting from a revision by the alcohol Taskforce Committee after the consultations. The document reflected possible national strategies for reducing harmful use of alcohol in Malawi (2008).</p> <p>“Strategy paper,” detailing strategic directions, themes and delivery mechanisms of the proposed national alcohol policy (2009).</p> <p>“Working Document,” whose purpose was to facilitate district-wide public consultations (2009).</p> <p>“National Alcohol Policy First Draft,” reflecting the outcome of the review and endorsement by the Inter-Ministerial Committee on Drugs Control of the Working Document (2009).</p> <p>“National Alcohol Policy Second Draft,” resulting from public district-wide consultations (2011).</p> <p>“National Alcohol Policy Third Draft,” an outcome of the National Stakeholders' Validation Meeting (2011).</p> <p>“National Alcohol Policy Fourth Draft,” resulting from a revision by the Taskforce Committee and incorporating new data from a three-month Alcohol Impact Baseline Survey (AIBS) and from a round-table dialogue on the alcohol policy for Malawi with the alcohol industry (2013).</p>

The second consultation, designed to receive the industry comments, was cancelled when industry representatives complained about the restrictiveness of the meeting and refused to participate. Industry instead demanded that a full stakeholders' workshop be convened to present its comments on the policy (Chibuku Products Limited & Carlsberg Malawi Limited, 2011b).

In March 2013, with the fourth draft ready, the Secretary for Health called for a round table dialogue with the alcohol industry on the alcohol policy for Malawi. Feedback on the changes made to the third draft was provided and the industry was invited to provide further contributions to the document. The meeting included representatives from several different government sectors, but civil society members participated as observers only. As of November 2013, a revised alcohol policy draft is still under consideration at the Ministry of Health, and it is too soon to tell whether the next version will meet the same high public interest standards set by previous drafts.

Discussion

This case study documents the process of developing a national alcohol policy in Malawi. We observed that political institutions and public bureaucracies played important roles in the policy-making process. Nonetheless, non-state actors—those who had a concern about particular policy issues or who were likely to be affected by policy developments—influenced the agenda and shaped the policy process as well. Civil society organizations and alcohol business interests all played critical roles in shaping the process and the policy.

This case study captures how a national NGO's participation in the policy arena introduced new dynamics to the process and effected a positive shift in the general progression of health policy development. Three elements seem to have contributed substantially to this shift. First, the involvement of international health and development partners, namely FORUT, provided significant resources, encouragement, and expertise, guaranteeing that the National Taskforce Committee could participate effectively in, and complete, the policy-development process. The second key element involved early organizational and operational planning and the introduction of support mechanisms to build participant capacity, facilitate coordination and communication among the actors, and create a management system that assured appropriate consultation and engagement. Lastly, the Malawi government's decision to assign the secretariat role to an NGO that had the time, motivation, and capacity to manage the policy process through to the end assured broad

public participation and a focus on evidence-based policy interventions.

Quite in contrast to developments in other African countries, Malawi designated an NGO, Drug Fight Malawi, to serve as secretariat and coordinator of the country's alcohol -policy process, creating a partnership between that agency and the Ministry of Health, which led efforts to draft the new policy. That confident collaboration between government and civil society seemed to work well throughout the process. To our knowledge, such a division of labor in crafting alcohol policy is entirely unique and has never before been documented and described.

Our review of alcohol policy development in Malawi demonstrates that an effective participatory process can be based on an adequately funded, legitimate organizing structure and sustained educational and motivational activities. This experience can serve as a model for other national governments that might engage in such a policy development process. One key element of the process presents a special challenge and deserves attention: achieving the right balance between encouraging broad stakeholder participation and managing the influence those parties exert on the process and policy outcomes. Care should be exercised to assure that a participatory approach facilitates the creation of effective, public-health-oriented policies.

This study tracked the policy development process only until a draft policy was delivered to the government. Since that time, internal government reviews have been conducted under the leadership of the Ministry of Health, complemented by external consultations with economic operators and civil society. Vested interests have accelerated their lobbying and have sought to change the document and slow its progress. That last-minute interference has clearly contributed to the slow pace of developing a national alcohol policy response.

As of November 2013, a final version of the national alcohol policy had been approved by the management of the Ministry of Health and transmitted to the health committee of the Parliament for members' review. Final approval of the policy lies with the President and the Cabinet.

Conclusion

This review of the Malawi alcohol-policy experience contributes to an understanding of policy development within a participatory process and highlights some of the challenges to bringing about policy change in

developing countries. We found clear evidence that alcohol policies can be shaped within a complex network of government and civil society actors and that broad stakeholder participation in the policy process can positively influence the end result. Broad participation in the policy process and the incorporation of people's views in the final policy document also strengthens ownership among a wide group of stakeholders, who later may provide the necessary public support for the effective implementation of the policy.

This study reinforces the need for more policy analysis in this field and for more on-the-ground research regarding both the public policy development process and policy implementation. Given the current, evolving state of alcohol-policy development in many countries, documenting practical experiences—and the roles of different actors in the process—in places where such attempts are made can be an important source of learning. Those experiences would provide a starting point for adaptation, refinement, and innovation in the alcohol policy-making process, helping countries to improve their management, coordination, and response to public concerns. A solid body of knowledge in this area would allow countries to achieve results more efficiently and quickly and could help moderate some of the possible negative influences that now impede the crafting of effective national policies.

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4. GENERAL DISCUSSION AND CONCLUSIONS

4. GENERAL DISCUSSION AND CONCLUSIONS

Alcohol is an important risk factor for many health problems and a major contributor to the global burden of disease. As noted by many researchers, it demands a stronger global response (Jernigan et al., 2000; Room et al., 2005; Casswell & Tamarangsi, 2009; Beaglehole & Bonita, 2009; Room, 2013). Since the adoption of the Global Strategy to Reduce the Harmful Use of Alcohol in 2010 by the World Health Organization's governing body, the World Health Assembly (WHA) (WHO, 2010b), there has also been increasing international recognition of alcohol as a major issue to be addressed in improving global health. However, because the world's highest alcohol consumption levels are found in the developed world, and especially in western and Eastern Europe, in most ongoing discussions and reports there has been a limited focus in Africa.

At the same time, due to the relative stability of alcohol per capita consumption in Africa and the high burden of communicable diseases, alcohol in Africa did not receive appropriate attention in policy debates nor did it receive the necessary budget allocation for research and policy implementation (WHO, 2010a). While little is known about the real contribution of alcohol to burden of disease in this continent, important changes are taking place. The growing influence of the alcohol industry in the African continent and lack of clear national alcohol policies (Jernigan, 2006; 2012; Jernigan & Babor, 2015; Babor et al., 2015) coupled with the already documented changes in drinking patterns and in alcohol consumption in several countries (Parry, 2005b; Gureje, 1999; Obot, 2000; 2007), provides ample cause for concern over the possibility of a rise in alcohol-related problems.

This thesis aims at providing new evidences on alcohol consumption and policy responses in Africa. In this section we summarize and discuss the main findings of the work developed and describe methodological limitations of the research undertaken. Finally we analyse the implications of our findings for future research and for alcohol-related public policy decisions in Africa and provide final conclusions.

4.1. Main findings

This thesis shows that alcohol consumption and related harms are a significant problem in Africa and therefore need to be addressed. As shown by our results, although only one third of the African population drinks alcohol, considerable harm is done through alcohol consumption (Study I). The amount consumed per drinker is nearer to about 20 litres of absolute alcohol consumed per year – the second highest in the world. Overall, alcohol consumption has a large impact on burden of disease and mortality in African countries, with alcohol being responsible, in 2012, for 6.4% of all deaths and 4.7% of all DALYs in the African Region.

These mortality figures present a higher number of deaths attributable to alcohol in the region than that previously estimated by Roerecke and colleagues for 2002 (Roerecke et al., 2008) (2.2% of all deaths and 2.5% of all DALYs) and by WHO for 2012 (WHO2013a) (3.3% of all deaths and 2.4 % DALYs). These changes reflect the introduction of infectious diseases and are consistent with previous evidence showing that the distribution of disease has changed and that due to new research evidence some disease categories attributable to alcohol, such as HIV/AIDS, have increased in relative weight (Woolf-King et al., 2013; Rehm et al., 2012, Gmel et al., 2011; Shuper et al., 2010; Fisher et al., 2007, Shield et al., 2013; Schneider et al., 2012).

This burden of mortality is non-trivial (and even higher than the global alcohol-attributable deaths), and demands a stronger response from countries to address the consequences of excessive alcohol consumption. Our results also show that the issue of what is or is not included in the final risk factor analysis has major policy relevance, especially for Africa where about 65.9% of all adults living with HIV are located (UNAIDS, 2010).

The findings here reported are in line with results found in previous studies showing that though the per capita consumption of alcohol in Africa is generally low (compared with consumption in Europe), the way that people drink is one with high potential for causing health or social harm (Obot, 2006; Schneider et al 2007; Parry, 2005b; Parry & Dewing, 2006; Roerecke et al., 2008; Seedat et al., 2009).

In terms of gender differences, the results reported here are similar to what traditionally has been reported from other parts of the world (WHO, 2014a). Alcohol has caused much more health burden for men than for women – the alcohol-attributable proportion of men's overall burden was about four times the proportion of women's. This may be due to the fact that men not only drink more but also engage in heavy drinking episodes (Wilsnack et al., 2009). Alcohol weakens inhibitions and due to norms/expectations males are more likely to act out – violently or in terms of risky sexual behaviour (WHO, 2005a; Morojele et al., 2006b). More women than men are abstainers; however, as countries develop, the difference between men and women is likely to disappear. Their vulnerability to alcohol-related harm is a major public health concern. First because the same level of consumption leads to more severe health consequences for women (Rehm et al., 2010a) (especially for cancers, gastrointestinal diseases or cardiovascular diseases) and secondly due to the severe health and social consequences for newborns (Patra et al., 2011; Popova et al., 2013). The highest ever recorded levels of foetal alcohol syndrome have already been documented in South Africa (May et al., 2000).

The findings also point to several factors which are closely tied to potential changes in alcohol consumption in Africa (Study II). In the review performed, increased physical and economic availability, the industry influence through corporate targeting and increased marketing activities, as well as weak policy infrastructures have been the most cited factors responsible for influencing alcohol consumption. A potential convergence of these various factors is likely to be associated with continued growth in alcohol consumption and alcohol-related morbidity and mortality across the continent. Furthermore, though the extent to which these factors may impact in alcohol consumption in Africa cannot be measured, a stronger understanding of how these factors mutually reinforce each other may assist policymakers in formulating effective policy measures to reverse the trend of increasing alcohol consumption, and at a minimum, maintain current levels of abstention.

Similar findings have been noted in other places where rapid economic changes are taking place such as China, India or Latin-America (Tang et al., 2013; Benegal, 2005; Monteiro, 2013). For example, the increase in production increases the availability of alcoholic beverages to the general population. At the same time, socio-economic power enables

more people to afford to buy commercial alcohol. Women in many countries, who traditionally had little economic purchasing power are likely to increase their consumption as many become economically active and financially independent. Our analysis also suggests that industry efforts to shape beliefs about alcohol consumption and to improve the image of international alcohol corporations are very present in the continent and are seen as a crucial element influencing alcohol consumption. Besides the huge investments made in marketing alcoholic beverages, the alcohol industry has been very active in the policy arena through active lobbying. Practices such as philanthropic sponsorships or entrepreneurship development programmes targeting youth allow global alcohol producers to represent themselves as ‘responsible’ corporate citizens and consequently influence decision makers and public opinion. Some of these efforts have been previously documented in research literature (Edwards et al., 2004; Babor, 2009; Bakke & Endal, 2010; Anderson, 2004; Casswell, 2012).

Under the scope of non-communicable diseases, best buys have been proposed as a core set of interventions capable of contributing to reduction of harmful use of alcohol. They include proven measures to reduce alcohol consumption, such as increased taxation; a ban on advertising, promotion and sponsorship; and drink-driving counter-measures (World Economic Forum, 2011). Effective intersectoral approaches within an effective regulatory environment that extends beyond national borders and appropriate funding have also been advanced as a basis for progress in countries where such policy measures already exist but fail to achieve their proposed outcomes (Parry, 2005a; WHO, 2013c, Freudenberg, 2014). The extent to which African countries have implemented this type of approaches to control alcohol consumption varies as shown in our analysis of alcohol control policies in several African countries (Study III). When evaluating current policy restrictiveness, countries attained a mean score of 44.1 of 100 points possible, ranging from 9.1 (Sao Tomé and Príncipe) to 75.0 (Algeria) showing that there is substantial room for improvement across the majority of the continent. Although the apparent restrictiveness of control policies varied across regulatory categories, our results show that a lot remains to be done in areas such as availability or establishing drink-driving policies, where countries earned only 14.6 points out of the 40.9 points possible (i.e., 36% of the points possible) and 14.8 points out of 36.4 possible points for drink-driving policies (i.e., 41% of the points possible), respectively.

Previous research on alcohol policies in low-and middle income countries has pointed to the value of introducing policies regulating the physical availability of alcohol, particularly those concerning business hours or involving a licensing system for off-premises alcohol retail sales, as well as minimum legal drinking age (Cook et al., 2014). In our understanding however, such efforts in this area are unlikely to be fruitful if not accompanied by strong political commitment in changing the policy environment. For example, to reduce availability in many African countries, important efforts are needed to bring unlicensed outlets into the regulated market; however this implies providing appropriate mechanisms and resources to those agencies tasked with monitoring and enforcing availability regulations. Evidence also indicates that establishing a low maximum legal BAC limit and strong, consistent enforcement can reduce traffic injuries and fatalities (Shults et al., 2001); however, our study shows that approximately 60% of the countries either had a legal BAC limit above 0.05 g/dl or did not have any established BAC limit for driving. Establishing or lowering a national legal BAC limit for drivers is therefore an important policy measure, given the large proportion of the alcohol-related burden of disease for Africa caused by unintentional injuries, including road traffic crashes (Roerecke et al., 2008). At the same time, while implementation of such measures is important, considerable efforts should be spent in enforcing them once they have been established.

Our findings on the correlation between alcohol control policies and APC among drinkers are consistent with existing evidence suggesting that restrictive alcohol control policies can yield reductions in alcohol consumption (Babor et al, 2010). The negative correlation between policy restrictiveness and APC among drinkers ($r_s = -.353$, $p = 0.005$) suggests that a more restrictive policy mix could, potentially, reduce the APC among drinkers and supports the usefulness of our API methodology.

The case of Malawi reflects the difficulties and complexities in a country's efforts to improve policymaking practice (Study IV). It captures the "challenge" of managing the influence of stakeholders on the policy process, and shows how a national NGO's participation in the policy arena introduced new dynamics to the process and effected a positive shift in the general progression of health policy development. In our discussion we draw attention to the considerable influence of the alcohol industry on government

policy through lobbying or even litigation against governments. This type of influence has been documented in other studies showing the ability of the alcohol industry to shape alcohol policy nationally and globally (Room, 2004; Casswell, 2009; 2013; Matzopoulos et al., 2012; McCambridge et al., 2014).

Our results highlight three elements that have contributed substantially to this shift in alcohol policy development in Malawi. First, the involvement of international health and development partners provided significant resources, encouragement, and expertise, guaranteeing that the multisectoral committee in charge of developing the policy document could effectively coordinate and contribute to the policy-development process. Secondly, an early organizational and operational planning for policy development and the introduction of support mechanisms to build participants' capacity, facilitate coordination and communication among the actors, has assured appropriate consultation and engagement from all participants. Lastly, the Malawi government's decision to assign the secretariat role to an NGO that had the time, motivation, and capacity to manage the policy process through to the end, assured broad public participation and a focus on evidence-based policy interventions. Our results show that combined efforts from the NGO sector and access to financial resources are important elements in ensuring that the alcohol public health field makes a contribution to public health-oriented alcohol policies in Africa.

We recognise several limitations in this study. First of all, burden of disease and mortality estimates are based on the best data available. While the overall data availability has improved since the first BoD study, Africa certainly still is the part of the world with the highest uncertainty of data due to lack of vital registration in many parts. Estimates are derived using different sources and risk relations used to estimate the burden of disease come essentially from developed countries and therefore may not hold true for Africa, especially since alcohol has synergistic effects with other risk factors such as malnutrition or socio-economic status (Katona & Katona-Apte, 2008; Probst et al., 2014). The same applies to unrecorded consumption where production, mainly homemade, is not covered in official statistics.

Secondly, to have a clear view of possible factors affecting consumption, we used a narrative review approach. This methodology can be used to add dimensions of insight

which is not yet available in existing literature. Limitations are well known and basically lie in the nature of the method which is seen as too subjective (in the determination of which studies to include, the way the studies are analysed, and the conclusions drawn). Therefore, although the search strategy was designed to be comprehensive, relevant published articles from other databases or records that were not associated with the key words used in the search might have been missed, and therefore were not included in this review. Secondly, the coding of factors within the articles can be somewhat subjective. To mitigate this, we used categories previously identified in related research. Thirdly, the identification of factors and their description depends on the quality of the available literature, and is subject to publication biases. We attempted to overcome this limitation by requiring each finding used in this analysis to be supported by evidence. Finally, countries in Africa are diverse in their levels of alcohol consumption, as well as alcohol-attributable harm, reflecting different contexts and realities. Consequently, some factors may have greater relevance in some countries compared to others, and the situation in each country cannot necessarily be generalized.

To study alcohol policies in countries we used a cross sectional design. Data was obtained from the Global Information System on Alcohol and Health (WHO, 2014b) and published surveys. This data has however some limitations. Data on alcohol policies are collected via reports from country focal points, so it is possible that data analysed does not capture all existing alcohol-related policies and regulations. However, efforts have been made to cross check data with published reports and through a process of approvals from countries to verify the accuracy of the data. Data on the implementation and enforcement was collected, but there may be discrepancies due to variations across different parts of the country or a lack of standardization in the way individual respondents are likely to report on the extent to which policies are implemented or enforced. To evaluate the restrictiveness of alcohol policies, we adapted the Alcohol Policy Index (API) from Brand et al. (2007). However we have not performed a sensitivity analysis and we recognise this as a limitation in our study. Furthermore we were not able to consider the extent to which countries enforce their regulations in our API. However, we do not feel that the outcomes of our API analysis or the correlation between the strength of policies and consumption are any less valid than those in previous studies that have used an API. These previous studies, such as Brand and colleagues (2007), Paschall and colleagues (2009), Cook and

colleagues (2014), and Carragher and colleagues (2014) also acknowledge that challenge of incorporating measures of enforcement into an API. In spite of this limitation we believe that it is notable that we found a relationship between the strength of the written alcohol policies and consumption, suggesting the validity of our API. In addition, the cross-sectional nature of our measures does not allow us to assess causality; we cannot be certain that restrictive policies leads to reduced alcohol consumption. Furthermore, our study leaves open the possibility that some of the observed co-variation could be the result of low consumption countries being more prone to adopt restrictive policies because of religious or cultural reasons.

Finally, single case study analysis, used in one of our studies, has been subject to a number of criticisms, the most common of which concern the inter-related issues of methodological rigour, researcher subjectivity, and external validity. The main limitation in our study on alcohol policy development is related to the case sampling. The choice was done by convenience, as researchers were familiar with and had access to the case. However, to mitigate this limitation and possible bias associated with it, a clear protocol and multiple sources of evidence during case study data collection were used. This provided the opportunity to triangulate data and check and recheck the consistency of the findings, thus making them as robust as possible.

Despite these limitations, there are major strengths in our study. First of all, the mortality and burden of disease estimates are based on the standardized methodology developed for the Comparative Risk Assessment for alcohol of the GBD 2005/2010 study (Kehoe et al., 2012; Rehm et al., 2010b), This was used to derive two outcome measures: deaths and disability adjusted life years (DALY) for 2012. Secondly, to comprehensively describe factors that potentially influence the prevalence and patterns of alcohol consumption in Africa, we used a systematic approach that followed accountable and explicit methods – to our knowledge this is the first attempt to do so. Another identified strength in our study lies on the fact that it adds to prior literature by beginning to assess and document the strength of a mix of alcohol control policies in countries across the African continent. Furthermore our methods to assess the restrictiveness of policies using the API show that it is possible to measure the restrictiveness of a mix of alcohol control

policies in developing countries, adding to the increasing number of studies evaluating alcohol control policies worldwide.

4.2. Study implications and recommendations

Our study shows that alcohol-attributable burden of mortality in Africa in 2012 is non-trivial (and even higher than the global alcohol-attributable deaths), and demands a stronger response from countries to address the consequences of excessive alcohol consumption. Our results also show that the issue of what is or is not included in the final risk factor analysis has major policy relevance, especially for Africa.

Furthermore, our analysis of existing policy responses fosters debate on measures needed to reduce burden and improve alcohol policy responses in Africa. At the national level, priority setting as well as pragmatic strategies and tools are required to implement national policies and action plans. Policy options to reduce harmful use of alcohol have already been identified in the global and regional strategies (WHO 2010b; WHO 2010a); however to improve countries response, countries need to define a comprehensive and effective policy response with clear indicators to be attained. The development of comprehensive national policies and action plans will facilitate contributions and clarify responsibilities of the various sectors, partners and stakeholders. However, the major challenge lies in transforming the written national policies into practical actions capable of having an impact in reducing alcohol consumption and related burden in Africa.

A broad reach of approaches is needed in response to the compelling evidence of both alcohol-related harm and the policies that have shown promise in reducing it. First of all, population wide approaches such as those linked with reduction of alcohol availability, advertising restrictions and taxation and pricing policies are needed as a way of protecting young people and preventing injuries. Secondly, individual-based interventions such as brief interventions, need to be implemented as they can have a notable impact in reducing alcohol consumption and related harm. Additionally the potential value of introducing alcohol-related preventive measures in primary health care and specialised HIV clinics, aimed at reducing alcohol consumption among people with HIV/AIDS or TB has already been noted (Chersich et al., 2009; Peltzer et al., 2013). Public awareness and the

promotion of interactive and regular collaboration between researchers, policy makers and communities to improve information dissemination is also essential for the sustainability of such policies.

In the light of our results, strong leadership at both the national and international levels and cross-sectoral commitment are also key ingredients for changes in alcohol policies. Strategic shifts in particular policy areas, such as public health infrastructures, the regulation of alcohol prices, marketing and availability and international trade agreements, are also needed. These strategic shifts require concerted actions, based on strong intersectoral collaboration and multidisciplinary action. However a crucial complimentary role, especially for implementation, lies with civil society, namely with regional networks, such as the Eastern and Southern African Alcohol Policy Alliances, public health associations and academia. To facilitate this collaboration, governments need to establish effective and permanent coordination mechanisms, such as a national alcohol council, to ensure that a coherent approach is taken and that policy objectives are translated into concrete actions.

Finally, as shown in our results, financial resources are an important element in ensuring that the alcohol public health field makes a contribution to public health-oriented alcohol policies in Africa and need therefore, as the ones for the tobacco field, to be made available.

4.3. Future research

Several areas for research have been identified in this thesis. First of all, because the quantity and patterns of alcohol consumption have changed significantly over the past years in African countries, and because research shows that youth and among women are clearly being targeted to initiate alcohol consumption (Anderson, 2009a; deBruijn, 2011; Casswell, 2012), there is a clear need for more research on consumption in these two groups. One area already identified by the WHO Collaborative Research Project on Alcohol, Health and Development (WHO, 2009c) is consumption among pregnant women namely on Fetal Alcohol Spectrum Disorder (FASD), one of the most dramatic

examples of impact of harmful use of alcohol on health of children and their families. Its prevalence in Africa is almost unknown.

Future studies should also investigate the influence of alcohol marketing and promotion in youth patterns of consumption. A growing body of evidence indicates that the alcohol industry's self-regulation scheme does not protect young people from exposure to potentially harmful alcohol marketing, and that such exposure encourages young people to start drinking at a younger age and to drink more hazardously once they have already begun to drink. Therefore, and due to the growing investment of the alcohol industry in marketing, limitations of industry self-regulation and the continuous monitoring of alcohol marketing practices constitute research priorities. Methodology used to monitor marketing materials and evaluate code violations in industry self-regulation codes is available (Donovan, 2007; Vendrame et al., 2010). An international collaborative project using common methodology to monitor and evaluate violations in industry self-regulatory codes, and to study the impact of alcohol marketing on vulnerable populations would certainly contribute for important global decisions on this controversial issue.

Research is also needed on the concept of alcohol policies and on the role of evidence in alcohol policy decision making. Having an understanding of the factors that result in less effective or ineffective alcohol control policies in low- and middle-income countries will contribute to inform policy options. The Malawi case study furthermore reinforces the need for more regular policy analysis of similar initiatives – in particular, in low-income developing countries – and for additional study of the alcohol-policy development process and policy implementation. In this context research should focus on the role and interactions of competing interests groups and on contextual barriers for policy implementation. Special attention need also to be given to investigate the nature of the relationships between the government sector and the alcohol industry and to develop innovative approaches for revenue generation to support policy and health system changes.

Future research should assess how the enforcement of alcohol control policies influences population level alcohol consumption, and whether the restrictiveness of alcohol policies is increasing or decreasing over time. Further research is undoubtedly needed to continue to explore how enforcement levels affect the relationship between alcohol control policies

and consumption. Context-specific research is also required to address implementation gaps of alcohol policies.

4.4. Conclusions

The present findings provide a strong basis for developing effective prevention efforts to reduce alcohol consumption and related harm in Africa. As a whole, this thesis contributes to the information platform needed to start giving alcohol the type of attention it deserves and foster debate to address this essential public health problem.

A main conclusion of the thesis is that in the light of new evidence, alcohol consumption and related harm in Africa accounts for a significant burden of disease and death. The high burden posed by alcohol consumption calls for a stronger public health response at national and international levels and for more effective prevention efforts. In particular, our thesis has implications for policy makers and on policy decisions. African governments need a new policy agenda and strong leadership in order to take a more active role in protecting the public's health.

This study has also shown the importance of including infectious diseases in future CRA analyses for BoD studies, as already advocated by other researchers (Room, 2013; Rehm et al., 2013). Not including this evidence in future analysis can affect the policy implications resulting from GBD studies – both by under-estimating the burden attributable to alcohol use and second, by under-estimating or ignoring the effect of alcohol on infectious disease. This can result in less attention (and funding) being given to implementing alcohol-related interventions (such as those proposed by the WHO in the Global Strategy for Reducing Harmful Use of Alcohol) (WHO, 2010b) specifically aimed at addressing alcohol related TB and HIV (Parry et al., 2010; Rehm et al., 2009b).

In addition, the thesis provides an examination of regional differences, which have not previously been presented in alcohol-related BoD reports. The analyses showed that the highest proportion of alcohol-attributable deaths for both sexes occurred in Southern Africa, a burden approximately three-times greater than the total burden for the African region. The present regional analysis can be seen as a baseline from which countries can start contextualise to their own particular sociocultural setting and chose more effective

interventions for that setting. For example, introducing intervention strategies targeting subgroups of the drinking population, such as primary care or HIV/TB clinics attendants with already high levels of consumption would be a very cost effective intervention as it would reduce alcohol impact on ill-health. The same applies for interventions aimed at preventing drink and driving, as it would contribute to reduce fatal and non-fatal traffic injuries, the leading contributor to overall diseases burden in many countries in the region.

The idea of a relative stability of alcohol per capita consumption in Africa is also challenged in this work. As shown in this study, alcohol per capita consumption needs to be interpreted with caution in Africa due to the high levels of abstention and high levels of young population. Not having an increase in alcohol per capita consumption does not mean that alcohol related harm is not increasing in the population. The considerable harm done through alcohol consumption in Africa demonstrated here calls for an increased attention and commitment from governments and international agencies. To our knowledge this is the first time that there has been a comprehensive description from a public health perspective of the effects of alcohol consumption in the population of Africa and of the factors that potentially influence the prevalence and patterns of alcohol consumption in African countries.

This thesis also constitutes a much needed first step to monitor alcohol control policy developments in a region where the alcohol environment is rapidly changing. Our study also adds to prior literature by beginning to assess and document the strength of a mix of alcohol control policies in countries across different countries. The negative correlation found in our analysis between policy restrictiveness and alcohol consumption among drinkers suggests that stronger alcohol policies should be developed to reduce alcohol-related burden in the African continent. This important conclusion fosters debate on measures needed to reduce burden and improve alcohol policy responses in Africa. At the national level, priority setting as well as pragmatic strategies and tools are required to implement national policies and action plans. Based on comprehensive national policies and action plans, countries need to define effective policy responses with clear indicators to be attained. This will facilitate contributions and clarify responsibilities of the various sectors, partners and stakeholders. However, the major challenge lies in developing and transforming the written national policies into practical actions capable of having an

impact in reducing alcohol consumption and related burden in Africa, while protecting those policies from vested interests.

A broad reach of approaches is needed in response to the compelling evidence of both alcohol-related harm and the policies that have shown promise in reducing it. First of all, population wide approaches such as those linked with reduction of alcohol availability, advertising restrictions, taxation and pricing policies are needed as a way of protecting young people and preventing injuries. Secondly, individual-based interventions such as brief interventions, need to be implemented as they can have a notable impact in reducing alcohol consumption and related harm. Additionally the potential value of introducing alcohol-related preventive measures in primary health care and specialised HIV clinics, aimed at reducing alcohol consumption among people with HIV/AIDS or TB has already been noted (Chersich et al., 2009; Peltzer et al., 2013). Public awareness and the promotion of interactive and regular collaboration between researchers, policy makers and communities to improve information dissemination is also essential for the sustainability of such policies.

In the light of our results, strong leadership at both the national and international levels is key ingredient for changes in alcohol policies. Strategic shifts in particular policy areas, such as public health infrastructures, the regulation of alcohol prices, marketing and availability and international trade agreements, are also needed. These strategic shifts require concerted actions, based on strong intersectoral collaboration and multidisciplinary action. However due to the inherent political difficulties in alcohol policy development, governments should strongly consider increasing the involvement of civil society organisations to support advocacy for a sound public-interest direction. A crucial complimentary role, especially for implementation, lies with civil society, namely with regional networks, such as the Eastern and Southern African Alcohol Policy Alliances, public health associations and academia. To facilitate this collaboration, governments need to establish effective and permanent coordination mechanisms, such as a national alcohol council, to ensure that a coherent approach is taken and that policy objectives are translated into concrete actions. Finally, as shown in our results, financial resources are an important element in ensuring that the alcohol public health field makes a contribution to public health-oriented alcohol policies in Africa and need therefore, as the ones for the tobacco field, to be made available.

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